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JINDŘICH ROHÁČEK

A monograph and re-classification of the previous genus *Limosina* MACQUART (Diptera, Sphaeroceridae) of Europe

With 1098 text figures

Part II*

B. Systematic part

Material and methods

Material. The material examined, comprising almost 12,000 specimens, mostly collected by the author but also from various institutions, museums and private collections (see abbreviations p. 199, part I), was examined with special regard to the revision of all available types and material of rare, doubtful or confused species.

Collecting methods. To obtain as wide a species spectrum as possible the most diverse collecting methods were used. Besides individual collecting on various kinds of excrement, decaying vegetation, carrion, rotten fungi, in runs and nests of small mammals, caves, cellars and on house windows, flies were intensively collected by means of sifting leaf litter, decayed grass, moss and Sphagnum and by sweeping over vegetation; also various trapping methods were successfully employed (soil traps, Malaise-traps, photoeclectors, light traps).

Preparation of the male genitalia and female terminalia. The dry material was moistened at 100% air humidity at room temperature for 3—5 hours. The complete abdomen was detached from the relaxed specimen, put into a vial with 10% solution of potassium hydroxide (KOH) in water and boiled for some minutes. Darkly pigmented specimens were lightened by a few drops of 30% solution of hydrogen peroxide (H_2O_2) in water added to boiling KOH. KOH was neutralized by solution of acetic acid (CH_3COOH) in water and the abdomen washed in water and transfered to glycerine. It was examined and further dissected in a drop of glycerine on a slide, under a binocular microscope. After examination, it was transfered to a microvial or plastic tube containing glycerine and pinned below the respective specimen.

Drawing techniques. The male external genitalia and female postabdomen and all outer characters except for the wing were drawn on squared paper using a binocular microscope with an ocular screen. Wings were drawn on a transparent foil laid on the screen of a projecting microscope. Only the male *S5*, aedeagal complex and telomere were examined and drawn under higher magnification (200—450x) — an ABBE's drawing apparatus was used to figure these structures.

Variability measurements. Six main characteristics of each species were measured — body length, ratio t_2 : mt_2 (length of t_2 : length of mt_2), wing length, wing width, *C*-index (length of Cs_2 : length of Cs_3) and $t_a - t_p$: t_p (length of $t_a - t_p$: length of t_p). It was impractical to measure every specimen examined, so only 10 males and 10 females (3 smallest, 4 medium and 3 largest examined specimens of each sex) of each particular species were measured. In rare species with less than 10♂ 10 ♀ examined all were measured.

* Part I in: Beitr. Ent. **32**, 195—282; 1982.

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Key to European subfamilies of Sphaeroceridae

1 *C* extended to M_{1+2} which is not abbreviated and reaches to wing margin. Anal and basal cells closed. Only 2 spermathecae present. Brachypterous and apterous forms always with a strong *va* spur on t_3 2

— *C* extended only to or somewhat beyond R_{4+5}. M_{1+2} reduced, never reaching wing margin. Anal cell lacking, basal cell fused with discal cell. 3 spermathecae. Brachypterous and apterous forms without strong *va* spur on t_3 3

2(1) M_{3+4} reaching to wing margin. Mesonotal bristles and hairs reduced to short spines or warts. Scutellum always without apical *sc* and basal *sc* reduced or scutellar margin provided with small teeth. t_3 without dorsopreapical hair. Puparium without posterior spiracular projections . . . . . Sphaerocerinae MACQUART, 1835

— M_{3+4} not reaching to wing margin. Mesonotum haired and setose. Scutellum with at least 2 pairs of *sc*. t_3 with a long dorsopreapical hair. Puparium with definite posterior spiracular projections . . . . . Copromyzinae STENHAMMAR, 1854

3(1) t_3 with short but robust *va* spur; pulvilli and claws considerably enlarged. Female postabdomen telescopically retractile with reduced sclerotization of segments . . . . . Ceropterinae VANSCHUYTBROECK, 1959

— t_3 with *va* spur reduced to a minute, often indistinct seta (Fig. 438) but sometimes there is a ventropreapical spine (see Figs. 1060—1063) here; pulvilli and claws weakly developed. Female postabdomen usually short and not retractile; when long, narrow and retractile (*Minilimosina* genera-group) then terga well developed . . . . . Limosininae FREY, 1921

Key to European genera of Limosininae

1 Wings and halteres absent. Scutellum shortened, transverse. Abdomen very broad and convex, much wider than thorax. Body heavily sclerotized . *Aptilotus* MIK, 1898

— Wings and halteres present though sometimes strongly reduced (Figs. 522, 523, 790, 791). Scutellum not shortened and abdomen narrower 2

2(1) Scutellum between apical *sc* with at least one pair of small setulae, disc of scutellum also more or less setulose; only 2 pairs of *sc* long. Cs_1 shortly and densely haired 3

— No setulae between apical *sc*, disc of scutellum usually bare; when setulose then at least 3 pairs of long marginal *sc* present and Cs_1 long and sparsely haired . . 4

3(2) Disc of scutellum densely overgrown by setulae. Anal vein angular . . . . . *Coproica* RONDANI, 1861

— Disc of scutellum with 1—2 pairs of small setulae. Anal vein sinuate . . . . . *Philocoprella* RICHARDS, 1929

4(2) t_2 with distinct ventropreapical bristle, sometimes (sg. *Pteremis* RONDANI, 1856) also with *va*, but this is usually absent. When the ventropreapical bristle also is absent (t_2 ventrally without any longer bristle) then mt_2 ventrally with distinct bristle . . . . . *Leptocera* OLIVIER, 1813

— t_2 always without ventropreapical bristle; *va* usually present, sometimes reduced in male. A distinct bristle on mt_2 present only in species with a long *va* (see Fig. 820) 5

5(4) Head with a row of distinct exclinate setae between *if* and *ors*. Eyes finely haired. R_{4+5} strongly bent up to *C*. Alula small, narrow (cf. DUDA, 1938, Figs. 56, 57). Very small species (0.7—1.2 mm) . . . . *Trachyopella* DUDA, 1918

— Head with a row of inclinate setulae or only with minute exclinate *ads* (often barely visible — see Figs. 32—34) between *if* and *ors*. Eyes bare 6

6(5) *C* with erect hairs, perpendicular to alar plane. Head with distinct inclinate row of setae between *if* and *ors*. Alula large, rounded apically (in contrast to *Trachyopella* — cf. DUDA, 1938, Fig. 58). R_{4+5} very strongly curved up to *C*, anal vein more or less distinctly angularly bent. Very minute species (0.6—1.2 mm) . . . . . *Elachisoma* RONDANI, 1880

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— *C* without erect setulae; anal vein sinuate. Head with only minute *ads* inside and below *ors*, only *Halidayina* has a row of small inclinate hairs inside *ors* besides the usual *ads* (see Fig. 1085) 7

7(6) Thorax with 4—6 *dc*, at least 1—2 of the anterior presuturals directed inwards. *Cs1* usually sparsely and long haired . . . . . *Thoracochaeta* DUDA, 1918

— *dc*, although sometimes as numerous as above (*Kimosina*, *Chaetopodella*), never directed inwards; the presutural *dc* (if present) are small and oriented backwards. *Cs1* usually shortly and densely haired 8

8(7) Body heavily sclerotized and strongly punctured (especially abdomen). Prosternum widely triangular posteriorly. *S3* very long (as long as *T3* and *T4* together). Male genitalia asymmetrical (postgonites) . . *Puncticorpus* DUDA, 1918

— Body usually less sclerotized and more finely punctured. Prosternum linear, at most slightly widened posteriorly. *S3* usually as long as *T3*. Male genitalia symmetrical 9

9(8) R_{2+3} apically sharply bent, sometimes with a short appendage of R_3; wings mottled or with dark spots; legs often variegated with some tarsal segments white; also thorax usually variegated, with paler tomentose spots . . . . . *Poecilosomella* DUDA, 1925[5]

— R_{2+3} usually less strongly bent and wings unspotted; legs and thorax not variegated 10

10(9) *Cs1* basally with a single long bristle (Figs. 1073, 1089). 1 (prescutellar) *dc* . . . 11

— *Cs1* basally with 2 shorter paired bristles (Fig. 40), one of them maximally twice length of the second. 1—6 *dc* 12

11(10) R_{4+5} doubly sinuate (Fig. 1089). Costal bristle normally directed inwards (posteriorly). Head with a row of inclinate setulae between *if* and the usual *ads* (Fig. 1085). Periandrium uniformly shortly haired. Male cerci simple (Figs. 1092, 1093). Telomere plain, flat. Female cerci long sinuate haired . . . . . 17. *Halidayina* DUDA, 1918 (p. 154)[5]

— R_{4+5} simply slightly bent up to *C*. Costal bristle directed parallel to *C* (Fig. 1073). No row of inclinate setulae between *if* and *ads*. Periandrium laterally with a row of 3—4 long bristles and with a long laterocaudal bristle. Male cerci unusually large and of peculiar form (Figs. 1077, 1078). Telomere large, of bizarre hoe-shaped form. Female cerci modified in long curved spines . . . . . 16. ***Rudolfia* gen. nov.** (p. 152)

12(10) Scutellum velvety black dusted. mt_2 (Fig. 820) with distinctive ventral bristle . . . . . 12. *Chaetopodella* DUDA, 1920 (p. 112)

— Scutellum not velvety black marked. mt_2 at most with a small ventral setula (see Figs. 379, 840) 13

13(12) t_3 with 3 bristles (Fig. 68), male t_2 characteristically modified (Fig. 69). Periandrium with 3 very long hair-like bristles, cercus with a long bristle (Fig. 75). Male *S5* with dense tuft of sinuate hairs on each side (Fig. 72). Female cercus with 2 shorter, thicker bristles (Fig. 47) . . 1. *Limosina* MACQUART, 1835 (p. 10)

— t_3 at most with a dorsopreapical bristle. Male t_2, periandrium, male *S5* and female cerci different 14

14(13) *Cs2* 1.8—2.2 times as long as *Cs3*, R_{2+3} very long (Fig. 80). Male *S3*—*S5* with incised anterior margins (Fig. 81); postgonite with very long hair-like setae (Fig. 85). Female postabdomen with short, stripe-shaped *T6* and *T7* and much longer associated sterna (Figs. 86—88). Large species (2.7—3.5 mm) . . . . 2. ***Gigalimosina* gen. nov.** (p. 12)

— *Cs2* at most 1.7 times as long as *Cs3* (usually less than 1.5), R_{2+3} shorter. Male *S3*—*S5* not incised anteriorly. Postgonite with short to minute setulae (only in *Apteromyia* with some longer setae on apex). Female postabdomen not as above 15

[5] Only *P. angulata* (THOMSON, 1869), a circumtropical species, probably secondarily spread to Canary Is. (HACKMAN, 1958; PAPP, 1977a).

[6] The numbered genera are included in the present work.

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15(14) Male *S1+2* with striking convex bulge (Fig. 106); male *S5* reduced, transversely stripe-like (Figs. 108, 110). Male postabdomen strongly down-curved because of large *T5* and *S7*. Male cerci modified into long, slender ventral projections below anal fissure (Fig. 117), phallophore somewhat projecting ventrally (Fig. 126). Female postabdomen rather telescopically retractile (Figs. 119—121), *T8* not divided. Larger species (2.1—3.1 mm) with *C* not extended beyond R_{4+5} . . . . . 4. ***Herniosina* gen. nov.** (p. 18)

— Male *S1+2* differently shaped, male postabdomen less curved. Male cerci, phallophore and *S5* different. Species with slender, ventrally projecting male cerci and similar female postabdomen are much smaller (less than 2 mm) and with *C* overpassing R_{4+5} 16

16(15) Male cerci medially not connected by subanal plate, instead there is an intraperiandrial sclerite often ventrally projecting in a mesolobus and connected by means of long arch-shaped arms with posterior parts of telomeres (Figs. 847, 862, 879). Telomere bipartite, fore part simpler and more or less separated from the hind part which is more complicated and provided with processes, keels and spines; distiphallus weakly sclerotized. Female postabdomen short, with *S8* reduced to 1—3 minute remnants armed by short bristles (Figs. 865, 868, 912). 3—6 *dc* (0—3 presutural, 3 postsutural). Cs_1 usually comparatively long and sparsely haired . . . . . 13. ***Kimosina* gen. nov.** (p. 115)

— Subanal plate either present or intraperiandrial sclerite reduced to minute sclerites or wholly absent, but never formed as above. Telomere differently formed. Female *S8* not reduced as above. Usually 1—2, rarely 3 *dc* (without considering the somewhat enlarged *dc* microsetae in some genera and/or species). Cs_1 shortly and densely haired 17

17(16) Epiphallus not developed, but pre-epiphallus may be present. Female *T9* distinct, not fused with cerci. Body more or less shiny despite some pollination 18

— Epiphallus clearly developed (Figs. 990, 997, 1030); female *T9* short, reduced and often fused with cerci (Figs. 992, 1014, 1046). Body heavily pollinose, rather dull, mesonotum often somewhat opalescent . . 15. ***Opalimosina* gen. nov.** (p. 137)

18(17) Periandrium with lateral projection at ventral margin, male cerci fused with periandrium but rather projecting ventrally (Figs. 101, 102). Distiphallus extremely large, spoon-shaped, posteriorly with unique long ventral projection (Fig. 96). Postgonite with some longer setae on apex. Male *S4* and *S5* very peculiar, with various processes (Figs. 97, 98). Female postabdomen short, *T7* posteromedially prolonged and flattened, *T8* divided in 2 plates, *S8* simple and bare, female cerci long sinuate haired (Figs. 103—105). R_{4+5} sinuate . . . . . 3. *Apteromyia* VIMMER, 1929 (p. 15)

— Periandrium simple, without projections. Male *S4* without processes, male genitalia and female postabdomen different. R_{4+5} of various shape (even sinuate) 19

19(18) *C* distinctly produced beyond R_{4+5} 20

— *C* not or indistinctly produced beyond R_{4+5}, spectacles-shaped sclerite always present 24

20(19) Female postabdomen long, narrow, essentially narrower than preabdomen at 6th segment, gradually tapering apically and telescopically retractile. R_{4+5} sinuate or slightly bent up to *C*, telomere never long and slender 21

— Female postabdomen short, as wide as preabdomen at 6th segment and suddenly tapering apically, not telescopic. R_{4+5} either almost straight (rarely indistinctly sinuate or bent but then telomere long and slender) or strongly curved to *C* (Fig. 745) 23

21(20) t_3 with dorsopreapical bristle (Fig. 332). Phallophore large and with distinct pre-epiphallus (Fig. 322), distiphallus of complex form. R_{4+5} sinuate, wing large. Female cerci widely separated, female *T9* broad, *S9* large, with 2 anterior incisions (Fig. 330) . . . . . 7. ***Xenolimosina* gen. nov.** (p. 47)

— t_3 without such bristle. Phallophore without pre-epiphallus. Female cerci close to one another, female *T9* usually narrow, *S9* without anterior incisions . . . 22

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22(21) R_{4+5} distinctly sinuate (Figs. 138, 152, 170), discal cell with rounded posterior outer corner, alula large and broad. Periandrium with dorsolateral bristle. Telomere internally with a comb of spines. Phallophore short, reduced, frame-shaped . . . . . 5. ***Terrilimosina* gen. nov.** (p. 21)

— R_{4+5} usually slightly bent up to C or very slightly sinuate, posterior outer corner usually not rounded, alula small, narrow and pointed. Periandrium without dorsolateral bristle, uniformly shortly haired. Telomere without internal comb of spines. Phallophore larger, compact . . . . 6. ***Minilimosina* gen. nov.** (p. 27)

23(20) R_{4+5} almost straight or very slightly sinuate or indistinctly bent (Figs. 918, 951, 969), wing never reduced. Scutellum without additional setae. Eye small (its diameter less than 2.5 times the narrowest genal width — Fig. 917), frons with numerous *ads*. Subanal plate and intraperiandrial sclerite not developed. Telomere very long and slender (Fig. 920, 954). Postgonite finely haired, distiphallus simple. Spectacles-shaped sclerite not developed . . . . . 14. ***Telomerina* gen. nov.** (p. 129)

— R_{4+5} curved up to C and ending farther from the apex of wing than projection of M_{1+2} would (Figs. 727, 776) or the wing reduced (Figs. 790, 791) and R_{4+5} straighter. Rarely R_{4+5} more straight (Fig. 711) but then scutellum with some additional setulae (Fig. 710). Eye larger (more than 3 times as long as the genal width). Frons with fewer *ads*. Subanal plate and intraperiandrial sclerite present. Telomere roughly quadrate to triangular (Figs. 713, 747, 778). Postgonite not finely haired or pubescent. Spectacles-shaped sclerite well developed . . . . . 10. ***Pullimosina* gen. nov.** (p. 98)

24(19) R_{4+5} sinuate (Figs. 339, 381, 408) or strongly bent (Fig. 807) to C. Periandrium without any longer bristle or hair, or with 1 long robust dorsolateral and 2—3 laterocaudal spine-like bristles (Figs. 810, 811). Telomere of more complex form 25

— R_{4+5} straight (or apically slightly recurved); when apically slightly bent then telomere with robust ventral spine and t_2 with *av* below middle. Periandrium normally with a long dorsolateral hair-like bristle (absent only in *S. villosa*) and telomere always simple . . . . . 9. *Spelobia* SPULER, 1924 (p. 59)

25(24) R_{4+5} very strongly bent up to C (Fig. 807) ending very far from the apex of wing. t_2 with *av* below middle. Periandrium with robust spine-like bristles. Male *S5* with postero-medial comb of spines. Telomere with external and internal lobe (Fig. 809). Female *T8* not divided, *S8* of complex form (Fig. 817); posteriorly to it there is a small additional sclerite. Spermathecae dish-shaped (Fig. 813) . . . . . 11. ***Spinilimosina* gen. nov.** (p. 110)

— R_{4+5} not as strongly bent up to C (Figs. 339, 408) or sinuate and apically straight (Figs. 381, 393). t_2 always without *av* below middle. Periandrium simply and uniformly short haired. Male *S5* without posteromedial comb of spines. Telomere short, with anterior and posterior lobe (Figs. 341, 395, 410). Female *T8* divided into 2 plates, *S8* simple and long; no additional sclerite behind it. Spermathecae never dish-shaped . . . 8. *Paralimosina* PAPP, 1973 (p. 49)

A practical key to species of the previous genus *Limosina* of Europe without identification of the genera

Because of the difficulty of identification of genera of the previous genus *Limosina*, based mainly on characters of the male and female terminalia, a more practical key to all species included in the present paper and belonging to the previous genus *Limosina* (beginning from couplet 10 of the foregoing key) was constructed. To make identification as easy as possible, unambiguous external features were selected. However, it is advisable to check identification by examination of the genitalia.

1 Cs_1 basally with a single long bristle (Figs. 1073, 1089) 2

— Cs_1 basally with 2 shorter paired bristles 3

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2(1) R_{4+5} doubly sinuate (Fig. 1089), prescutellar *ac* pair slightly enlarged; periandrium finely haired, female cerci sinuate haired . . . . . *Halidayina spinipennis* (HALIDAY)

— R_{4+5} simply slightly bent to *C* (Fig. 1073), prescutellar *ac* pair very long, as long as *dc*. Periandrium with 3—4 long lateral bristles, female cerci spine-like and curved . . . . . *Rudolfia rozkosnyi* (ROHÁČEK)

3(1) Scutellum velvety black dusted; mt_2 with distinctive *av* (Fig. 820) . . . . . *Chaetopodella scutellaris* (HALIDAY)

— Scutellum never velvety black dusted; mt_2 at most with a small ventral setula (Figs. 379, 840) 4

4(3) t_3 with 3 bristles (Fig. 68), male t_2 strongly modified (Fig. 69). Large species (2.8—3.6 mm) . . . . . *Limosina silvatica* (MEIGEN)

— t_3 at most with 1 dorsopreapical bristle; male t_2 different 5

5(4) Cs_2 1.8—2.2 times as long as Cs_3, R_{2+3} very long (Fig. 80), R_{4+5} sinuate. Facial cavity yellow to orange. Large species (2.7—3.5 mm) . . . . . *Gigalimosina flaviceps* (ZETTERSTEDT)

— Cs_2 at most 1.7 times as long as Cs_3 but then either the facial cavity is dark or the species is much smaller or R_{4+5} is straight. *C*-index usually lower than 1.5 6

6(5) t_a—t_p shorter than t_p (Figs. 300, 727), wing never reduced 7

— t_a—t_p at most as long as t_p or the wing is reduced 8

7(6) *C*-index lower than 0.6 (Fig. 300), only 1 *dc* . . . . . *Minilimosina* (*A.*) *alloneura* (RICHARDS)

— *C*-index larger than 0.8 (Fig. 727), 2 *dc* and often a shorter seta between them . . . . . *Pullimosina* (*P.*) *heteroneura* (HALIDAY)

8(6) Scutellum with at least one additional setula besides the 2 long *sc* (Fig. 710) . . 9

— Scutellum with only 2 usual *sc* 10

9(8) Scutellum with a single small seta in front of basal *sc*. Male cerci projecting ventrally (Fig. 1012); female cerci with very short setulae (Fig. 1015) . . . . *Opalimosina* (*D.*) *denticulata* (DUDA)

— Scutellum with some minute setulae between basal and apical *sc* and in front of basal *sc* (Fig. 710). Male cerci simple; female cerci sinuate long haired (Fig. 718) . . . . . *Pullimosina* (*D.*) *dahli* (DUDA)

10(8) *C* distinctly extended beyond R_{4+5} 11

— *C* not or indistinctly extended beyond R_{4+5} 21

11(10) Wing reduced, shorter than abdomen and often also narrowed 12

— Wing normal, longer than abdomen 14

12(11) 3 *dc*, wing broad (Fig. 841), t_2 with proximal *pd*, male t_2 ventrally with double row of short spines (Fig. 840) . . . . . *Kimosina* (*C.*) *spinosa* (COLLIN)

— 2 *dc* but often 1—2 shorter bristles in front of them; wing narrower (Figs. 152, 790), t_2 without proximal *pd*, male t_2 with a small *av* below middle (Fig. 775) 13

13(12) Facial cavity yellow. *T1+2* with simple pigmentation . . . . . *Pullimosina* (*P.*) *meijerei* (DUDA) f. brach.

— Facial cavity black. *T1+2* characteristically pigmented (Fig. 159) . . . . . *Terrilimosina sudetica* (ROHÁČEK)

14(11) R_{4+5} strongly bent up to *C*, ending farther from apex of wing than unpigmented fold of M_{1+2} (Figs. 727, 745) . . . . . continued by couplet 3 in key on p. 100 (*Pullimosina*)

— R_{4+5} slightly bent to *C*, straight or sinuate, ending nearer the apex of wing than unpigmented part of M_{1+2} 15

15(14) t_3 with a dorsopreapical seta (Fig. 332) . . *Xenolimosina setaria* (VILLENEUVE)

— t_3 without dorsopreapical seta 16

16(15) t_2 with proximal *pd*, in male with ventral double row of short spines, 3 *dc* . . . . . *Kimosina* (*C.*) *spinosa* (COLLIN)

— t_2 without proximal *pd*, 1—3 *dc* 17

17(16) R_{4+5} sinuate and with large alula (Figs. 138, 153); posterior outer corner of discal cell rounded . . . . continued by couplet 1 in key on p. 23 (*Terrilimosina*)

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— R_{4+5} straight, slightly curved or sinuate but with small alula; discal cell with posterior outer corner usually not rounded and with short appendage of M_{3+4} 18

18(17) R_{4+5} regularly s-shaped (Figs. 93, 94). Male *S4* with large flat posterior projection (Fig. 98). Female with posteriorly prolonged and tapered *T7* (Figs. 103, 104) . . . . . *Apteromyia claviventris* (Strobl)

— R_{4+5} very slightly sinuate, bent or straight. Male *S4* and female *T7* different 19

19(18) Pleurae usually with large to small shining spots (Figs. 179, 191, 224), mesonotum more or less shining. R_{4+5} slightly bent or very slightly sinuate. Female postabdomen telescopically retractile. Male genitalia without epiphallus and without long slender telomeres . . . . . continued by couplet 1 in key on p. 28 (*Minilimosina*)

— Pleurae completely dull and densely dusted, mesonotum subshining, dull or opalescent. R_{4+5} slightly bent, straight or indistinctly sinuate. Female postabdomen short, not retractile. Male genitalia with epiphallus or with very long slender telomeres 20

20(19) Epiphallus developed, telomere never long and slender. Female *T9* reduced, often fused with cerci. Female *S8* small and variously modified; R_{4+5} slightly curved . . . . . continued by couplet 2 in key on p. 138 (*Opalimosina*)

— Epiphallus not developed, subanal plate and intraperiandrial sclerite absent. Telomere very long and slender. Female *S8* large and convex (Figs. 926, 961). R_{4+5} usually straight, more rarely very slightly curved or indistinctly sinuate . . . . . continued by couplet 1 in key on p. 130 (*Telomerina*)

21(10) 3 or more *dc* 22

— 2 or 1 *dc* (sometimes 1—2 enlarged microsetae in front or between them in addition) 23

22(21) R_{4+5} apically slightly recurved (Fig. 695). t_2 without proximal *pd* (Fig. 692). 2 basal antennal segments pale yellowish brown . . . . . *Spelobia* (*B.*) *bifrons* (Stenhammar)

— R_{4+5} slightly sinuate, slightly curved or almost straight. t_2 with proximal *pd* (Figs. 838, 855). 2 basal antennal segments dark . . . . . continued by couplet 1 in key on p. 116 (*Kimosina*)

23(21) R_{4+5} sinuate (Figs. 93, 114, 352, 381, 632, 658) or apically very strongly bent up to *C* (Fig. 807) 24

— R_{4+5} straight (Figs. 423, 439, 456, 522) or slightly bent (Figs. 536, 667, 996, 1036) 29

24(23) t_2 with proximal long *pd* 25

— t_2 without proximal long *pd* 26

25(24) R_{4+5} slightly sinuate (Fig. 632), t_2 besides the proximal *pd* with *pd* also near middle (Fig. 627) . . . . . *Spelobia* (*S.*) *nana* (Rondani)

— R_{4+5} more sinuate or apically strongly curved, t_2 without *pd* near middle (Figs. 334, 405) . . . . . continued by couplet 1 in key on p. 50 (*Paralimosina*)

26(24) R_{4+5} strongly curved up to *C* (Fig. 807), 1 *dc* . . . . . *Spinilimosina brevicostata* (Duda)

— R_{4+5} more or less sinuate, 2 *dc* 27

27(26) *av* below middle of t_2 present. Alula large. 3 *if*, the middle very long and crossing . . . . . **S. (S.) belanica spec. nov.**

— t_2 without *av* below middle, in male with a ventral row of short black spines. Alula small. 4—5 *if* of about equal length, only the anterior shorter 28

28(27) Male *S4* with large posterior projection (Fig. 98); male postabdomen not curved (Fig. 95). Female postabdomen short, *T7* prolonged and tapered posteriorly . . . . . *Apteromyia claviventris* (Strobl)

— Male *S4* simple. Male postabdomen strongly down curved (Fig. 106) and *S1+2* with a convex bulge. Female postabdomen long, telescopically retractile, *T7* simple (Fig. 119) . . . . . continued by couplet 1 in key on p. 19 (*Herniosina*)

29(23) Alula large, R_{4+5} more or less straight. t_2 chaetotaxy rich. Phallophore simple. Usually larger species (1.3—2.7 mm). Wing sometimes reduced . . . . . continued by couplet 1 in key on p. 61 (*Spelobia*)

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— Alula small, R_{4+5} slightly but distinctly curved. t_2 chaetotaxy poor. Phallophore with epiphallus. Small species (0.9—1.7 mm). Wing never reduced . . . . . continued by couplet 2 in key on p. 138 (*Opalimosina*)

1. Genus ***Limosina*** MACQUART, 1835

Limosina MACQUART, 1835: 571; RICHARDS, 1930: 291 (as subgen.); DUDA, 1938: 101 (as subgen.); HARRISON, 1959: 265 (as subgen.); VANSCHUYTBROECK, 1962a: 474; HACKMAN, 1969a: 203; PAPP, 1973c: 38; RICHARDS, 1973: 370 (as subgen.) (part.)
Type species: *Borborus silvaticus* MEIGEN, 1830 (des. by WESTWOOD, 1840: 154).

Trichogaster LIOY, 1864: 1116 (part.), nom. preocc. by *Trichogaster* BLOCK & SCHNEIDER, 1801 (fide RICHARDS, 1930: 265).
Type species: *Borborus silvaticus* MEIGEN, 1830 (orig. des.).

Scotophilella DUDA, 1918: 34 (as subgen.); DUDA, 1925: 75 (key, as subgen.); SPULER, 1925b: 70 (as subgen.) (part.).
Type species: *Borborus silvaticus* MEIGEN, 1830 (des. by DUDA, 1924a: 6).

Diagnosis: The genus can be characterized as follows.
(1) *pvt* small but distinct (see Fig. 33)
(2) 4—6 (usually 5) *if*, 1—2 most anterior shorter
(3) 6—8 small *ads* inside and below *ors*
(4) *g* comparatively small
(5) 2 *hu*, the external large, also the internal rather long
(6) 2 *dc*, the prescutellar long
(7) 10—12 (rarely 8) rows of *ac* hairs
(8) 2 *stpl*, the anterior reduced to a minute seta
(9) scutellum large, long, *sc* long
(10) male femora thickened, f_2 characteristically bristled
(11) t_2 chaetotaxy (Figs. 69—71) different in males and females
(12) t_3 with 3 strong bristles (Fig. 68)
(13) *C* not extended beyond R_{4+5}
(14) R_{4+5} distinctly sinuate but its apical part almost straight
(15) discal cell long, with posterior outer corner usually rounded
(16) alula large, broad and rounded
(17) female postabdomen wide and short, not retractile
(18) male *S5* smaller than *S4*, characteristically shaped and very long sinuate haired
(19) periandrium with 3 very long hair-like bristles
(20) male cerci somewhat reduced, each carrying a long caudal hair
(21) hypandrium rod-like, unusually long and slender
(22) telomere relatively small, lobe-shaped, with only a few bristles
(23) phallophore slender, rather long; epiphallus not developed
(24) distiphallus dorsally tuberculate and shortly spinose
(25) postgonite large, with a long hair besides some short setulae
(26) ejaculatory apodeme absent
(27) female *T8* divided into 2 lateral sclerites
(28) female *T9* comparatively short, with a pair of dorsal setae
(29) female *S8* small, roundly cordate
(30) female *S9* short, band-shaped
(31) spermathecae elongately pear-shaped, with short sclerotized parts of ducts
(32) female cerci each with 2 short, thick bristles (dorsopreapical and apical).

Discussion: The genus *Limosina* MACQUART, 1835, is clearly related to the genus *Gigalimosina* gen. nov. having similarly formed aedeagal complex, dorsal t_2 chaetotaxy (especially in female), wing venation and large body size but differing from it as well as from all other genera of Limosininae by its peculiar chaetotaxy of t_3 (Fig. 68), distinct

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sexual dimorphism in the legs (especially the second pair), characteristic male *S5*, periandrium and shortly bristled female cerci. *Limosina* forms with *Gigalimosina*, *Apteromyia* and *Herniosina* a group of genera which is, despite some heterogeneity, probably monophyletic (see chapter "Phylogeny").

Limosina was described by MACQUART (1835) including 9 species the first of which (*Borborus silvaticus* MEIGEN) was subsequently designated as type-species by WESTWOOD (1840). All the species placed by MACQUART (1835) in *Limosina* are now in various genera of the subfamily Limosininae. A rather similar situation occurred with the genus *Trichogaster* LIOY, 1864. On the contrary, *Scotophilella* DUDA, 1918, described originally as a subgenus of *Limosina*, had already contained only those species (including *Borborus silvaticus*) which were recently placed in the genus *Limosina* in a narrower sense (HACKMAN, 1969a; PAPP, 1973c). Since *Limosina silvatica* (MEIGEN) alone represents a distinct genus, both these taxa (i.e. *Trichogaster* LIOY, *Scotophilella* DUDA) must be retained in the synonymy of the genus *Limosina* because they have the same type-species, while some other taxa which have been synonymized with *Limosina* but based on different type-species are to be reinstated as valid (*Apteromyia* VIMMER, *Halidayina* DUDA, *Spelobia* SPULER).

Thus the genus *Limosina* MACQUART includes only its type-species, *Limosina silvatica* (MEIGEN, 1830) at present time. No other described species seem to belong here.

Limosina silvatica (MEIGEN, 1830)

(Figs. 1, 32, 33, 38–50, 68–75)

Borborus silvaticus MEIGEN, 1830: 207
Limosina silvatica: MACQUART, 1835: 572; HALIDAY, 1836: 326; ZETTERSTEDT, 1847: 2500, 1860: 6411; STENHAMMAR, 1854: 362; PAPP, 1973c: 45 (key)
Copromyza silvatica: ZETTERSTEDT, 1838: 771
Limosina sylvatica: RONDANI, 1880: 28
Limosina (*Scotophilella*) *silvatica*: DUDA, 1918: 105
Leptocera (*Scotophilella*) *silvatica*: DUDA, 1925: 154 (key)
Leptocera (*Scotophilella*) *sylvatica*: SPULER, 1925b: 257
Leptocera (*Limosina*) *silvatica*: RICHARDS, 1930: 291
Leptocera silvatica: SÉGUY, 1934: 470; NARTSHUK, 1970: 345 (key)
Limosina (*Limosina*) *silvatica*: DUDA, 1938: 146

Type material: Lectotype ♂ (des. by ROHÁČEK in 1978) labelled: "Paris" and "*sylvaticus*, Coll. WINTH."; paralectotypes 1♂ 1♀ labelled "*sylvaticus*, Coll. WINTH."; paralectotype ♂ labelled: "*sylvaticus*" (? MEIGEN's handwriting) and "*sylvaticus*, Coll. WINTH" (NMW). All specimens in good condition.

Material examined (besides "Type material"): 144 ♂ 157 ♀

Spain: 6♂ 8♀ (JRO) — Sierra Nevada Mts.-Llano Prado, Güejar Sierra nr. Granada, Grazalema nr. Ronda (ROHÁČEK leg.).

Italy: 1♂ (MCV) — Prealpi Venete Mts.-Bus de Barba Checchi (PAOLETTI leg.).

Romania: 1♀ (JRO) — Transsylv. Alp. (STROBL leg.).

Czechoslovakia: 134 ♂ 140 ♀ (NMP, MMB, VUP, PFB, SMO, JRO, MHK). — Bohemia: Cheb (GRADL leg.), Doupov Mts.-Lochotín, Nečemice nr. Rakovník (ROHÁČEK leg.), Svádov (PAWLIK leg.), Vrané n. Vlt. (ZEMAN leg.), Praha-Kunratice (KOVÁŘ leg.), Zásmuky (VALEŠOVÁ, LAŠTOVKA leg.), Hluboká (KOVÁŘ leg.), Dačice (ROHÁČEK leg.), Pardubice-Svítkov, Choltice (MOCEK leg.); Moravia: Třešť, Řásná nr. Telč, Brno-Soběšice, Mor.kras-Babice, Šošůvka, Býčí skála, Holštýn, Pekárna (cave) (ROHÁČEK leg.), Mor.kras-Ochozská jeskyně, Výpustek (CZIŽEK leg.), Vršovice nr. Opava, Hnězošice, Hradec n. M., Klokočov (distr. Opava), H. Jeseník Mts.-V. Kotlina, peat-bog Skřítek, Zámčisko (ROHÁČEK leg.), and localities given by ROHÁČEK (1980); Slovakia: Kremnické poh. Mts.-Turček env., V. Fatra Mts.-Suchá dolina, Lubochňa, Kečovo, Zadiel, Belanské Tatry Mts.-Biele pleso, Monkova dolina, Tristárska dolina, Tatranská Kotlina (ROHÁČEK leg.).

Denmark: 3 ♂ 8 ♀ (ZMK) — EJ: Mols, Strandkaer (LYNEBORG leg.); WJ: Blåvand (MORTENSEN leg.); NWJ: Agger (MORTENSEN leg.), Nors, Ørgård (LYNEBORG leg.); F: Humble, Langel. (MARTIN leg.); NEZ: Boserup (HANSEN leg.); B: Balka Strand (MORTENSEN leg.), Almindingen (L. L., O. M. & B. V. P. leg.).

Description:

Male. Total body length 2.86–3.61 mm, general colour black, sparsely greyish brown dusted. Head (Figs. 32, 33) brown (anteriorly) to blackish (posteriorly). Frons posteriorly and occiput blackish brown or black, anterior part of frons brown to reddish, sparsely dusted and shiny. Frontal triangle shiny, interfrontalia and orbits sparsely grey dusted. *pvt* present though small, hair-like. 4–6 *if*, 1–2 most anterior usually smaller; 6–8 minute *ads*. Frontal lunule, face and anterior part of gena reddish brown to orange or yellowish brown, also facial cavity medially pale yellowish brown, laterally darker brown. *g* relatively small; behind it a short row of additional setulae. Some minute hair-like setulae also on face. Postocular and peristomal hairs well developed. Eye of normal size, its diameter about 3.2 times the smallest genal width. Antennae black, 3rd segment often paler brown and yellowish pubescent. Arista about 3.7 times as long as antenna, relatively long ciliate (longer than on 3rd segment).

Thorax black, sparsely greyish brown pollinose; mesonotum comparatively shiny, pleurae more heavily dusted and dull. Thoracic chaetotaxy as in Figs. 38, 39 — 2 *dc*, 10–12 (rarely 8) rows of *ac* hairs between anterior *dc*. Besides the strong external *hu* also an internal *hu* well developed. Sutures between pleural sclerites yellowish brown. 2 *stpl*, the anterior reduced to a minute seta. Scutellum large, long, roundly triangular, with long *sc*. Legs black, trochanters, knees and tarsi brown. All femora somewhat thickened, f_1 basally with long, pale, fine hairs; also mt_1 posteriorly long finely haired. Mid leg very peculiar (Fig. 69). f_2 ventrally with dense group of bristles, t_2 curved and ventrally bearing a number of distinctive bristles and 2 striking tufts (*av* and *pv*) of long sinuate hairs; also mt_2 curved and posteroventrally long, finely haired. f_3 ventrally with 1–2 strong bristles before half, t_3 (Fig. 68) with characteristic chaetotaxy. Ratio t_2: mt_2 = 1.90–2.13. Wing (Fig. 40) with yellowish brown membrane, veins brown. *C* hardly overpassing R_{4+5}, the latter distinctly sinuate but apically almost straight. Discal cell long, with hind outer corner rounded; anterior outer corner with short appendage of M_{1+2} con-

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tinued by colourless venal fold. Alula large, broad. Wing measurements: length 2.68–3.18 mm, width 1.07–1.27 mm, *C*-index = 1.04–1.17, $t_a - t_p$: t_p = 4.26–4.85. Halteres with orange stem and black knob.

Abdomen (Figs. 41–43) black, dorsally sparsely haired and dusted, rather shiny; preabdominal terga with longer bristles on lateral margins. Preabdominal sterna more densely haired, *S1+2* with medial pair of long bristles on posterior margin. *S5* (Fig. 72) very peculiar, with lateral lobes densely overgrown by tufts of long, wave-shaped hairs and with a medial bifurcate projection. In front of the latter projection 2 small finger-like processes – all these structures with some fine hair-like setulae.

Genitalia. Periandrium (Fig. 75) shortly cylindrical, with extremely long hair-like bristles (dorsolateral longest, 2 shorter laterocaudal) besides a number of shorter bristles. Cerci reduced, each carrying a long, curved caudal bristle. Hypandrium very long, rod-like. Telomere (Fig. 73) lobe-shaped, with sparse bristles. Aedeagal complex (Fig. 74) relatively small. Phallophore slender and comparatively long. Distiphallus long, with heavily sclerotized ventral fork, membraneous and dorsally tuberculate apex. Also a protuberance situated in the middle of the distiphallus has dorsally tubercles or short spines. Postgonite large compared to other parts of aedeagal complex, and in addition to some short setulae with one long posterior hair in apical third. Ejaculatory apodeme not found.

Female (Fig. 1). Similar to male except for the peculiarities mentioned below. Total body length 3.02–3.73 mm. Femora slender, f_1 and mt_1 without long fine pilosity, mid leg unmodified. t_2 chaetotaxy as in Fig. 70, 71. f_3 ventrally without stronger bristles. t_3 with same chaetotaxy as in male. mt_2 long and slender, ratio t_2: mt_2 = 1.64–1.78. Wing measurements: length 2.82–3.29 mm, width 1.15–1.33 mm, *C*-index = 0.92–1.16, $t_a - t_p$: t_p = 3.73–4.87. Abdomen as in Figs. 44–46, *S1+2* with enlarged medial pair of bristles on posterior margin.

Postabdomen (Figs. 47–49) short, wide. *T6* and *T7* simple oblong. *T8* divided in two lateral, widely separated plates. *T9* shortly triangular, with a pair of dorsal setae. *S6* and *S7* with some longer bristles on posterior margins, otherwise shortly densely haired. *S8* reduced to an oval or roundly cordate plate with a few setae. *S9* short, inverse widely V-shaped, rather band-like, with 2 longer setulae. Spermathecae (Fig. 50) pear-shaped, with short sclerotized parts of ducts. Cerci medium long, each with 2 thick, relatively short bristles (dorsopreapical and apical) and some short hairs.

Preimaginal stages: GODDARD (1938: 239, Fig. 1 A–F) figured the egg, cephalopharyngeal skeleton of larva and puparium, but described only the egg and puparium. The anterior spiracular process of the puparium resembles that of *Herniosina bequaerti* (VILLENEUVE).

Discussion: The species is easily recognizable by its large size, chaetotaxy of t_3 and secondary sexual features of the male, particularly its modified mid leg, as well as the very characteristic male *S5*, armature of periandrium and female cerci. The only European species – *Gigalimosina flaviceps* (ZETTERSTEDT) – which reaches the same length differs from it in its very large *C*-index, simply haired t_3 and completely different male and female terminalia.

L. silvatica is one of a few species of Sphaeroceridae which cannot be confused with other species even by non-specialists.

Biology: Predominantly a phytosaprophagous species developing in decayed vegetable refuses in woodland areas. It is very common on decaying wet leaves by streams in deciduous forests but also in caves (BEZZI, 1907, 1911; CZIŽEK, 1916; ARNDT, 1921; DUDA, 1928, 1938; PAPP, 1973c, 1978b; PAPP & PLACHTER, 1976). However, it was also bred from cow dung (LAURENCE, 1955) and GODDARD (1938) found puparia in cattle droppings. The life-history of *L. silvatica* was studied by GODDARD (1938) who reared it on boiled cut grass. Under laboratory conditions the female laid some 100 eggs and the whole life-history lasted 44 days, but in natural circumstances 76–212 days (LAURENCE, 1955). RICHARDS (1930) had observed that it does not occur on excrement but only on manure with mixed straw. It is very probable that owing to its obligatory phytosaprophagity the species can develop only in the excrement of herbivorous animals. LAURENCE (1955) found that adults occur on cattle droppings only during winter (XI–II) and supposed that they live in different habitats during the rest of year. This is certainly correct because imagoes were collected during the whole year (RICHARDS, 1930).

Distribution: The species is widespread throughout Europe (from Spain to Finnish Lapland and Faeroe Is.) but reported also from Tunisia (PAPP, 1977b) and North America (USA – SPULER, 1925b). The species is probably Holarctic in distribution although no data are available from Asia up to the present.

2. Genus *Gigalimosina* gen. nov.

Type species: *Limosina flaviceps* ZETTERSTEDT, 1847

Diagnosis: The genus is defined as follows.

(1) *pvt* very minute, hidden among postocellar hairs
(2) 3–4 *if*, the most anterior small
(3) 7–8 very minute *ads* inside and below *ors*
(4) *g* small

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(5) 2 *hu*, the internal hardly longer than *ac* microsetae
(6) 2 *dc*, a shorter postsutural and a longer prescutellar
(7) 8 rows of *ac* hairs
(8) 2 *stpl*, the anterior reduced to a minute hair
(9) t_2 chaetotaxy as in Figs. 77—79, different ventrally in the male and female
(10) male f_1 and f_3 thickened
(11) *C* not producing beyond R_{4+5}
(12) Cs_2 very long, *C*-index oscillating round 2
(13) R_{2+3} unusually long
(14) R_{4+5} sinuate, apically almost straight
(15) discal cell long, with long process of M_{1+2}
(16) alula small and narrow
(17) male *S3* to *S5* with a deep anterior incision
(18) female postabdomen wide and short, not telescopic
(19) male *S5* large and long
(20) male *S6* and *S7* large and therefore the anal fissure oriented ventrally
(21) periandrium short, with 1 longer dorsolateral and 2 laterocaudal bristles
(22) male cerci well developed
(23) telomere large, with some projections and long haired internally
(24) phallophore simple, rather long, epiphallus not developed
(25) distiphallus slender and well sclerotized
(26) postgonite large, with some long hairs
(27) ejaculatory apodeme absent
(28) female *T6*—*T8* strikingly short, band-shaped
(29) female *T9* long, with a pair of dorsal bristles
(30) female *S6* very large in comparison with *T6*
(31) female *S7* long, tapering anteriorly, triangular; *S8* oblong
(32) female *S9* short, V-shaped
(33) spermathecae ball-shaped with cylindrical bases of ducts
(34) female cerci with long sinuate hairs.

Discussion: The very high *C*-index (long R_{2+3}), male *S3*—*S5* with anterior incision, short periandrium with anal fissure oriented ventrally in consequence of strongly developed *S6* and *S7*, very characteristic aedeagal complex (mainly the long haired postgonite and unusually shaped distiphallus), very short female *T6* — *T8* etc. are considered as the most diagnostic features of the genus *Gigalimosina* gen. nov.

The genus belongs to the *Limosina* genera-group and resembles *Limosina* MACQUART, especially in the formation of the male aedeagal complex, dorsal chaetotaxy of t_2 and wing venation (except for the very long R_{2+3}) but the simple t_3, modified male sterna, wholly different male *S5* and periandrium, very short female postabdominal terga and differently haired female cerci do not allow one to conclude that these genera are very closely related. The genera *Herniosina* and *Apteromyia* also show some affinities to *Gigalimosina*, at least as to some features. See discussion under *Herniosina*, *Apteromyia* and in the chapter "Phylogeny").

Gigalimosina gen. nov. includes only species in the Palaearctic Region, viz. *G. flaviceps* (ZETTERSTEDT, 1847).

Gigalimosina flaviceps (ZETTERSTEDT, 1847), **comb. nov.**

(Figs. 76—88)

Limosina flaviceps ZETTERSTEDT, 1847: 2501, 1860: 6412; STENHAMMAR, 1854: 360; PAPP, 1973c: 46 (key)
Limosina (Scotophilella) flaviceps: DUDA, 1918: 104
Leptocera (Scotophilella) flaviceps: DUDA, 1925: 154 (key)
Leptocera (Limosina) flaviceps: RICHARDS, 1930: 292
Leptocera flaviceps: SÉGUY, 1934: 466; NARTSHUK, 1970: 348 (key)
Limosina (Limosina) flaviceps: DUDA, 1938: 121

Type material: Described from male(s) originating from South Sweden, Scania (ZETTERSTEDT, 1847). No syntype is located in the ZETTERSTEDT's collection (ZIL) but KIM (1972) refers to 4 syntypes in the collection of STENHAMMAR (ZIU). However, these specimens (examined!) cannot be syntypes — they are unlabelled and all (1 ♂ 2 ♀, 1 specimen without abdomen) belong to *Coproica lugubris* (HALIDAY, 1836), a different species which is unlikely to have been confused with *Limosina flaviceps* by ZETTERSTEDT or STENHAMMAR. Possibly these specimens were erroneously pinned under the label „*Limosina flaviceps*" in STENHAMMAR collection by a person other than STENHAMMAR, who knew *L. flaviceps* and described it correctly in his monograph (STENHAMMAR, 1854). The true types are apparently lost.

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Material examined: 124 ♂ 112 ♀

Denmark: 2 ♂ 2 ♀ (ZMK) — NEZ: Dyrehaven, Ermelund, Bøllemose, Ordrup Mose (LUNDBECK leg.).

Czechoslovakia: 120 ♂ 109 ♀ (SMO, JRO) — Moravia: Třešť, Hradec n. M., Hněvošice, Klokočov (distr. Opava), H. Jeseník Mts.-V. Kotlina, peat-bog Skřítek, Keprník Mt., peat-bog Rejvíz (ROHÁČEK leg.), and localities given by ROHÁČEK (1980); Slovakia: Kremnické poh. Mts.-Turček, V. Fatra Mts.-Krížná Mt., cave Tufna, Lubochňa, Belanské Tatry Mts.-Monkova dolina (ROHÁČEK leg.).

Austria: 2 ♂ 1 ♀ (NMA) — Steiermark: Steierische Alpen Mts., Admont (STROBL leg.).

Description:

Male (Fig. 76). Total body length 2.78—3.50 mm, general colour black, sparsely pollinose, shiny except for the pleurae. Head with occiput, ocellar triangle and hind part of orbits black to dark brown; frons yellowish brown, interfrontalia darker, frontal lunule, face, facial cavity and gena yellow to orange. Very small convergent *pvt* present; 3 *if* as a rule, the most anterior the smallest. *g* small, not longer than peristomal hairs. A long row of about 7—8 *ads* inside and below *ors*. Eye diameter 3 times the smallest genal width. Antennae yellowish brown, 3rd segment darker and densely ciliate. Arista about 4 times as long as antenna, with medium long pubescence.

Thorax with rather shiny mesonotum and more heavily dusted and dull pleurae. Thoracic chaetotaxy as defined for the genus — 2 *dc*, 8 rows of *ac* hairs, 2 *stpl* (the anterior minute); scutellum large, with long *sc*. Pleurae black, but sutures between particular pleural sclerites yellowish brown. Legs black, coxae and trochanters yellow to yellowish brown, tarsi and knees brown. f_1 and f_3 thickened (Fig. 76), t_2 chaetotaxy as in Fig. 79, ventrally with a row of short thick spines and cluding one larger situated more distally and a very small *va*. mt_2 very long, ratio $t_2 : mt_2 = 1.38—1.58$. Wing (Fig. 80) with brownish yellow membrane, veins dark brown. *C* not overpassing $R_{4+5} \cdot R_{2+3}$ very long. R_{4+5} sinuate, apically straighter. Discal cell long, with posterior outer corner usually rounded and fore outer corner with long venal process of M_{1+2} beyond t_p. Alula small and narrow. Wing measurements: length 2.46—3.22 mm, width 0.94—1.20 mm, *C*-index = 1.81—1.96, $t_a - t_p : t_p = 3.68—4.31$. Halteres with black knob sharply contrasting with orange stem.

Abdomen black, shiny, dorsally and ventrally very sparsely haired. *T1+2* normal, without any desclerotization. *S3—S5* (see Fig. 81) of distinctive form, anteriorly broadly and rather deeply incised. *S5* large, long, prolonged posteromedially; this medial prolongation finely spinulate.

Genitalia. Periandrium short (Fig. 83), anal fissure oriented ventrally because of strongly developed *S6* and *S7* (see Figs. 76, 81). Periandrium with a longer dorsolateral hair and 2 laterocaudal bristles, otherwise shortly haired. Cerci distinctly developed and densely haired. Hypandrium slender and rather long. Telomere (Fig. 82) with 2 posterior processes, a flat proximal and a finger-like distal. Ventrally also with a flat process, long wavy haired internally. Aedeagal complex (Fig. 85) with large, compact phallophore and slender, heavily sclerotized distiphallus. Postgonite with 2 short setae on anterior tubercle proximally and 4 long hairs on slender distal part ... Ejaculatory apodeme not found.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 2.66 to 3.18 mm. Legs with f_1 and f_3 simple, slender. Ventral chaetotaxy of t_2 differing from that of the male, with only long *va* (Figs. 77, 78). All bristles of dorsal side of t_2 somewhat longer. Ratio $t_2 : mt_2 = 1.47—1.67$. Wing measurements: length 2.86—3.27 mm, width 1.07—1.30 mm, *C*-index = 1.94—2.17, $t_a - t_p : t_p = 3.88—4.56$. Preabdominal sterna of normal shape, without anterior incisions.

Postabdomen (Figs. 86—88) with very short, band-shaped *T6—T8* in comparison with much longer associated sterna. *T9* long, with a pair of dorsal setae. *S6* large and long. *S7* tapering anteriorly, rather triangular. *S8* transversally oblong, *S9* short, V-shaped. In the natural position the postabdomen is dorsally contracted and its apex with cerci is directed dorsally. Spermathecae (Fig. 84) ball-shaped, with cylindrically dilated terminal portions of spermathecal ducts. Cerci each with 2 long sinuate hairs and some small hairs.

Discussion: The species is easily recognized by its large size, very high *C*-index, partly yellow head and many features in the male abdomen and genitalia (modified *S3—S5*, large *S6* and *S7*, characteristic telomere and aedeagal complex) as well as the female postabdomen (shortened *T6—T8*, triangular *S7*, spermathecae). Also the chaetotaxy of t_2 and bulbously thickened male f_1 and f_3 are characteristic.

The identity of the species has not been confirmed by examination of the type material (lost, see "Type material"), but it can be easily identified from the original description (ZETTERSTEDT, 1847). It is not surprising that all subsequent authors recognized it correctly.

Biology: The species has hitherto been considered rare but recently its habitat was discovered (ROHÁČEK, 1980) and the species proved to be much more common than it had been assumed before. It lives in shady woods on wet decayed leaves, chiefly in ravines, rock slots and caves (see e.g. VANSCHUYTBROECK, 1943 b) and seems to be associated with highlands. However, I have collected it repeatedly also on decayed fungi, HACKMAN (1967 a) recorded it from a mole nest and RICHARDS (1930) even from dung. It has been obtained by the soil trap method, too (ROHÁČEK, 1980). Adults are known to occur in I—XI (combined data of the authors cited above and the material examined).

Distribution: Probably a Central European (s. lat.) species. There are records from Spain (BEZZI, 1911 as *Limosina ? coxata* STENHAMMAR), France (SÉGUY, 1934), England and Scotland (RICHARDS, 1930, 1976), FRG (PAPP & PLACHTER, 1976), GDR (DUDA, 1918, 1938), Poland (DUDA, 1918), Czechoslovakia (DUDA, 1918; ROHÁČEK, 1978 b, 1980), Austria (DUDA, 1918), Italy (DUDA, 1918), Roumania (VANSCHUYTBROECK, 1943 b), Denmark (material examined, new), South Sweden (ZETTERSTEDT, 1847; STENHAMMAR, 1854; HACKMAN, 1967 a), USSR-Estonia (HACKMAN, 1972).

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3. Genus *Apteromyia* Vimmer, 1929, gen. restit.

Apteromyia Vimmer, 1929: 66
Type species: *Apteromyia Všetečkai* Vimmer, 1929 (orig. des.) = *Limosina claviventris* Strobl, 1909

Aptilomyia Vimmer, 1929: 67 (key) (lapsus), **syn. nov.**
Všetečkiella Vimmer, 1931: 334 (key) (nom. nud.), **syn. nov.**
Group of *L. claviventris* Strobl: Richards, 1930: 299

Diagnosis: The genus is characterized by the following features.
(1) *pvt* absent
(2) 4 *if* (the anterior small)
(3) 2—6 small *ads*
(4) *g* very small and thin
(5) 2 *hu*, the internal small, hair-like
(6) 2 *dc*
(7) *ac* hairs in 8—10 rows between anterior *dc*
(8) 2 *stpl*, the anterior reduced to a minute setula
(9) scutellum relatively short, rounded trapezoid
(10) t_2 chaetotaxy (Figs. 89—92). t_2 in female ventrally with only *va*, in male with a row of short spines in apical fourth
(11) *C* not (or very slightly) produced beyond R_{4+5}
(12) R_{4+5} s-shaped
(13) discal cell relatively long, outer corners never rounded
(14) alula small, pointed
(15) male *S4* and *S5* with large posterior projections
(16) male *S6* and *S7* large, *T5* shortened
(17) periandrium with a row of lateral bristles at lower margin and peculiar lateral projection
(18) cerci fused with periandrium, projecting ventrally, each carrying a robust spine
(19) hypandrium of medium length
(20) telomere bipartite (proximal and distal part articulated)
(21) phallophore short, tapering distally
(22) distiphallus large, with a long posteroventral process
(23) postgonite long, with some longer apical bristles
(24) ejaculatory apodeme present, small
(25) female postabdomen short, wide; *T7* posteromedially prolonged
(26) female *T8* divided into 2 lateral sclerites
(27) female *T9* short, with a pair of dorsal bristles
(28) female *S8* reduced to a small, rounded plate
(29) female *S9* short, transverse, ribbon-shaped
(30) spermathecae roughly pear-shaped
(31) female cerci slender, long, long wavy haired.

Discussion: The genus *Apteromyia* Vimmer is defined by many apparently autapomorphic features, the formation of the male abdomen especially being unlike that of any other genus. The most characteristic features are the strongly modified male *S4* and *S5*, peculiar periandrium, bipartite telomere and aedeagal complex with posteriorly projecting distiphallus. Female postabdomen is also rather specific, particularly the widely separated lateral plates of divided *T8*, prolonged *T7* and reduced *S8*.

Apteromyia belongs to the *Limosina* genera-group but its real position remains unclear. There are two possible phylogenetic relationships: 1. *Apteromyia* is more closely related to *Limosina* and *Gigalimosina* (synapomorphies: long and long haired postgonite, short female postabdomen), 2. *Apteromyia* is closest to *Herniosina* (synapomorphies: male cerci, bristles at lower margin of periandrium, and the posterior projection of distiphallus if we accept a theory that it is derived from phallophore). For further details see chapter "Phylogeny" and the respective cladograms (Figs. 61, 62).

DOI: 10.21248/contrib.entomol.33.1.3-195

Apteromyia was originally described by VIMMER (1929) as a monotypic genus containing an apterous species *A. vseteckai* VIMMER, 1929. However, RICHARDS (1951) revised the type specimen and found it to be a male *Limosina claviventris* STROBL with both wings missing. Therefore, he placed *Apteromyia* VIMMER as a synonym of *Limosina* MACQUART. Now that *L. claviventris* is recognized to represent a distinct genus, *Apteromyia* VIMMER, 1929, must be used as its name. In his key to genera of Sphaeroceridae, VIMMER (1931) has introduced for unknown reasons the new name *Vseteckiella* (instead of *Apteromyia*) without description or designation of type species. Thus, it is nomen nudum and syn. nov. of *Apteromyia* (see synonymy).

Besides *A. claviventris* (STROBL, 1909) no other Palaeartic species seem to belong to the genus *Apteromyia*.

Apteromyia claviventris (STROBL, 1909), **comb. nov.**

(Figs. 19–24, 89–105)

Limosina claviventris STROBL, 1909: 299; PAPP, 1973c: 44 (key)
Limosina (Scotophilella) claviventris: DUDA, 1918: 145
Leptocera (Scotophilella) claviventris: DUDA, 1925: 159 (key)
Leptocera (Limosina) claviventris: RICHARDS, 1930: 299
Leptocera claviventris: SÉGUY, 1934: 465; NARTSHUK, 1970: 348 (key)
Limosina (Limosina) claviventris: DUDA, 1938: 113
Limosina brevispina DAHL, 1909: 376
Apteromyia Všetečkai VIMMER, 1929: 65

Type material:
Limosina claviventris STROBL: Lectotype ♂ (des. by ROHÁČEK in 1980), pinned together with 1 ♂ 1 ♀ paralectotypes on the same bricked from elder pith and labelled: "Admont Steierm. STROBL" and "*Limosina claviventris* m. II ♂ I ♀ 30/10 (hand-written), Styria STROBL" (printed). The lectotype is marked by a small red rectangle on minutia pin below specimen (NMA).
Limosina brevispina DAHL: Holotype ♂ labelled: "Zool. Mus. Berlin, F.: Grunewald, Erlenlaub 16. 8. 08, S.: DAHL 1652". Very faded specimen (preserved in alcohol) with all left legs, left wing and terminalia detached and mounted on a slide labelled: "*Limosina brevispina* F. DAHL" and „DAHL 1652" (ZMB) (examined).
Apteromyia Všetečkai VIMMER: Holotype ♀ "Vranné n. Vlt., IV. 1926, u *Lasius fuliginosus*" (VIMMER, 1929) (not examined). The holotype had been studied in 1939 by O. W. RICHARDS (see RICHARDS, 1951) and still that year returned to VIMMER (letter communication by Dr. B. H. COGAN, 1979). It has not been rediscovered in VIMMER's collection (NMP) and was probably destroyed by VIMMER himself when he heard from RICHARDS that it is only *Limosina claviventris* with both wings torn off.

Material examined (besides "Type material"): 171 ♂ 157 ♀
GB: 5 ♂ 3 ♀ (BML, UMO) – England: Cambs: Chippenham, Kirtling (COLLIN leg.), Berks: Windsor Forest (DONISTHORPE leg.), Herts: Cuttley, Trent Park (COLYER leg.).

Czechoslovakia: 166 ♂ 150 ♀ (JRO, SMO, MMB, NMP, PFB, VUP, JZP, RMM, MHK) – Bohemia: Doupovské hory Mts.-Lochotín (ROHÁČEK leg.), Krušné hory Mts.-Celná (MOCEK leg.), Svádov (PAWLIK leg.), Zichovec nr. Slaný (KOVÁŘ leg.), Lužná, Líšany nr. Rakovník (RAMBOUSEK leg.), Praha-Modřany, Praha-Krč (ZEMAN leg.), Praha-Ruzyně (ŠKALOUDOVÁ leg.), Vranné n. Vlt. (RAMBOUSEK leg.), Nová Hlína nr. Třeboň (ZUSKOVÁ leg.), Planá n. L. (MÁCA leg.), Zásmuky (VALEŠOVÁ, LAŠTOVKA leg.), Palupín nr. Strmilov, Třeboň (ROHÁČEK leg.), Opočno, Hor. Jelení, Uhersko (MOCEK leg.); Moravia: Třešt, Otín nr. Stonařov, Řásná nr. Telč, Slavonice-Janov (ROHÁČEK leg.), Lednice (OBRTEL leg.), Milovice nr. Mikulov, Mušov (POKORNÝ leg.), Pálava, Valtice, Brno-Soběšice, Mor. Kras-Pekárna, Babice (ROHÁČEK leg.), Mor. Kras-Býčí skála (CZIŽEK leg.), Mor. Kras-Evina díra (MOCEK leg.), Jehnice (MOCEK leg.), Zastávka nr. Brno, Hradec n. M., Brumovice, Hněvošice, Vršovice, Nová Lublice, Jánské Koupele, Úvalenské louky (distr. Opava), H. Jeseník Mts.-peat bog Skřítek, Rejvíz (ROHÁČEK leg.) and localities given by ROHÁČEK (1980); Slovakia: Belanské Tatry Mts. – Tristárská dolina, Vihorlat Mts.-Stakšín env. (ROHÁČEK leg.).

Austria: 1 ♀ (NMA) – Steiermark: Admont (STROBL leg.).

Hungary: 1 ♀ (TMB) – Börzsöny hg. Magyarkút (BAJZA & PAPP leg.).

Denmark: 1 ♀ (ZMK) – NEZ: Holte (LUNDBECK leg.).

Finland: 1 ♀ (ZMH) – Ab: Nystad (HELLÉN leg.).

Description:
Male. Total body length 1.49–2.08 mm, general colour black, sparsely brownish grey pollinose, subshiny. Head black, subshiny. Frons black, sparsely blackish grey pollinose, frontal triangle more shining. *pvt* not developed, 3 strong and usually 1 minute (most anterior) *if*, 2–6 small *ads* inside and below *ors*, and about 4 minute hairs on face in addition. A narrow anterior margin of frons and face sometimes brown. Frontal lunule and facial cavity black to blackish brown, the latter rather shiny. Gena black, greyish black pruinose, *g* small, hardly longer than peristomal hairs. Eye normal, its diameter about 3.0 times the narrowest genal width. Antennae black, 3rd segment dark brown and rather long pale ciliate, this pilosity longer than that of arista. Arista about 3.6 times as long as antenna, relatively shortly ciliate.

Thorax black, greyish brown pruinose, mesonotum despite pruinosity shiny, pleurae more dusted and duller. Mesonotal chaetotaxy – 2 *dc*, the anterior short; 8–10 rows of *ac* hairs, the medial prescutellar *ac* pair enlarged. Sutures between pleural sclerites paler brown; 2 *stpl*, the anterior reduced to a minute hair. Scutellum large, wide, rounded trapezoid, with fine dorsal microsculpture. Legs blackish brown to black, trochanters, knees and tarsi pale brown. f_2 basally with distinctive row of bristles (Fig. 89). t_2 chaetotaxy as in Figs. 89, 90, ventrally with a short row of short spines in apical fourth and reduced *va*. Ratio t_2: $mt_2 = 1.76–1.94$. Wing (Figs. 93, 94) with brown membrane and darker brown veins, *C* the darkest. Venation rather variable. *C* not or very slightly (Fig. 93) produced beyond R_{4+5}. R_{4+5} more or less regularly sinuate, apically distinctly upcurving to *C*. Discal cell with well developed pigmented appendages of M_{1+2} and M_{3+4} beyond t_p as a rule, fore outer corner highly variable (acute to obtuse-angled, see Figs. 93, 94). Alula small, narrow, acute. Wing measurements: length 1.23–2.06 mm, width 0.54–0.83 mm, *C*-index = 0.92–1.23, $t_a–t_p : t_p = 2.47–3.22$. Halteres with blackish brown knob and yellow stem.

Abdomen (Fig. 95) black, sparsely greyish brown pollinose, rather shiny. Terga and sterna very sparsely haired. *S1+2* and *S3* with a pair of long hairs on posterior margins. *S4* (Fig. 98) characteristically modified, with very large, flat, somewhat bifurcate posterior projection, carrying a pair of long basal bristles and a pair of robust subapical spines. *S5* of complex form

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(Fig. 97), membraneous centrally. It carries two robust lateral projections on posterior margin (each consisting of a rounded process and smaller hook-like projection); between them, in the middle of posterior margin, arises a long, double, arch-shaped, backwardly directed projection with finely haired apex. *S6* relatively large, flat. *S7* unusually long, with a fissure in sclerotization, bare.

Genitalia. Periandrium (Figs. 101, 102) rather large, very shortly haired, with small anal opening, distinctive lateral projection and a row of 3 strong lateral bristles near lower margin. Cerci large, fused with periandrium, each forming a projection carrying robust blunt spine, otherwise finely pubescent. Hypandrium medium sized, laterally widened, rod-like sclerite. Telomere (Fig. 100) bipartite; proximal part bare, more or less quadrate, with 2 distal projections articulating with distal part which carries a number of bristles and has peculiar shoe-shaped apex. Aedeagal complex (Fig. 96) large. Phallophore small, its distal, stem-like part contacting with extremely large distiphallus which is composed of a unique, robust, posteroventrally projecting process and spoon-shaped apex. Postgonite also of complex form, proximally with anterior tubercle-shaped appendage, centrally with a flat posterior projection and apically with 4 relatively long bristles. Ejaculatory apodeme present, partly hidden in the phallophore opening.

Female. Head, thorax, legs and wing as in male unless mentioned otherwise. Total body length 1.47–2.50 mm. f_2 without short basal comb of bristles; t_2 ventrally with only *va* (Figs. 91, 92) and *pd* situated usually more proximally than *d* (see Fig. 91). Ratio $t_2 : mt_2 = 1.74–1.85$. Wing measurements: length 1.19–2.20 mm, width 0.48–0.95 mm, *C*-index = 0.98 to 1.28, $t_a–t_p : t_p = 2.42–3.50$. Abdomen with normally developed, unmodified preabdominal terga and sterna. Terga very sparsely haired (mainly laterally), also sterna rather scarcely and shortly haired.

Postabdomen (Figs. 103–105) short, wide. *T7* much narrower than *T6*, prolonged and tapering posteriorly in a flat projection. *T8* divided into two widely separated lateral plates. *T9* short, basally more pigmented, with 2 dorsal hairs. *S7* large, long but narrower than *S6*. *S8* reduced to a small, rounded and bare plate with very narrow medial posterior incision. *S9* short, stripe-shaped, with some hairs posteriorly. Spermathecae pear-shaped, flattened from the side (Fig. 99), ducts relatively short. Cerci long and slender, each with 2 long sinuate hairs (apical and dorsopreapical), shorter sinuate ventropreapical hair and 2 small hairs.

Preimaginal stages: RICHARDS (1930, Plate I, Figs. 7, 8) figured the puparium. However, this illustration had been made from a defective specimen. OKELY (1974: 51, Fig. 32) remedied this mistake giving a new illustration and description. The puparium has the anterior spiracular process spine-like, somewhat resembling that of *Pullimosina moesta* or *Pull. pullula* but shorter (Figs. 19, 20). Some other structures of the puparium are shown in Figs. 21–24.

Discussion: A very distinctive species, at least in the male sex, easily identifiable by its peculiar abdominal structures (*S4*, *S5*, periandrium, aedeagal complex). Female differs from the species with similar wing venation (e.g. some *Paralimosina* spp.) by the t_2 chaetotaxy and postabdomen (*T7*, reduced *S8*).

Aptéromyia vseteckai VIMMER, 1929, has been described from one male with both wings broken as new apterous genus. This mistake was shown by RICHARDS (1951) who synonymized this species with *A. claviventris* (STROBL).

The original description of *Limosina curtiventris* STENHAMMAR, 1854, partly corresponds to *A. claviventris* but the differences are such (cf. DUDA, 1918: 147) that we are obliged to suppose that *L. curtiventris* STENHAMMAR was described from a mixture of species (*Aptéromyia claviventris*, *Terrilimosina schmitzi*, *T. racovitzai* ?). Unfortunately the type material is not preserved (KIM, 1972) and, consequently, *Limosina curtiventris* is considered as "species dubia" (see p. 158).

Biology: A common species in damp, shady habitats, especially in shady woods, caves, cellars, burrows of various small mammals, nests of ants etc. (RICHARDS, 1930; PAX & MASCHKE, 1935; HACKMAN, 1963a, b, 1967a; PAPP, 1973c, 1976a; PAPP & PLACHTER, 1976). The populations living in cellars and similar dark rooms of human dwellings would be regarded as hemisynanthropic.

The species is rather eurycoenic not only with regard to habitats but also as to feeding substrate. It is apparently polysaprophagous as it was reared from decayed vegetation (RICHARDS, 1930; HACKMAN, 1963b; OKELY, 1974), fungi (HACKMAN & MEINANDER, 1979), excrement of voles and insect carrion (HACKMAN, 1963b) and from ant nest (RICHARDS, 1930). I have collected it in numbers in compost heaps, on decayed fungi, in leaf-litter, on decayed potatoes in cellars etc. It is interesting that it does not occur on the excrement of larger mammals. Thus, the only factors limiting the occurrence of this species are sufficiently high humidity and low light-intensity. Adults were found during the whole year, chiefly in caves, cellars, mole nests etc. where it develops continuously.

Distribution: Europe — GB: England (RICHARDS, 1930, 1976; OKELY, 1974); France (SÉGUY, 1934), Belgium (VANSCHUYTBROECK, 1942), FRG (DUDA, 1918; PAPP & PLACHTER, 1976), GDR (DAHL, 1909; DUDA, 1918), Poland (PAX & MASCHKE, 1935); Czechoslovakia (many records, summarized by ROHÁČEK, 1978b); Austria (STROBL, 1909; DUDA, 1918); Hungary (PAPP, 1973c, 1976a; PAPP & PLACHTER, 1976); Denmark (material examined, new); Sweden (HACKMAN, 1967a); Finland (FREY, 1941; HACKMAN, 1963a, b), USSR: Estonia (HACKMAN, 1972). The only non-European record (Central Africa — VANSCHUYTBROECK, 1950a) needs revision.

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4. Genus *Herniosina* gen. nov.

Limosina bequaerti-group: ROHÁČEK, 1978a: 49
Type species: *Leptocera* (*Limosina*) *Bequaerti* VILLENEUVE, 1917

Diagnosis: The genus is defined by the following complex of characters.
(1) *pvt* absent
(2) 4—5 *if*, the most anterior shorter
(3) 2—5 small *ads* inside and below *ors*
(4) *g* small
(5) 2 *hu*, the internal reduced to a minute setula
(6) 2 *dc*, the anterior short
(7) *ac* in 6—8 rows, the medial prescutellar pair enlarged
(8) 2 *stpl*, the anterior very small, hair-like
(9) scutellum large, rounded triangular
(10) t_2 chaetotaxy as in Figs. 111—113, in male ventrally with a row of short spines, in female with a long anteroapical and *va* bristle
(11) *C* not extending beyond R_{4+5}
(12) R_{4+5} sinuate, apically almost straight
(13) discal cell long, its outer posterior corner often rounded
(14) alula relatively small, narrow
(15) female postabdomen narrow, telescopically retractile
(16) male abdomen apically strongly down-curved in consequence of extreme development of *T5* and *S7* (Fig. 106)
(17) male *S1+2* protruding in a convex bulge
(18) male *S5* reduced, transverse, band-shaped
(19) periandrium with a row of long lateral bristles at lower margin and a longer dorsolateral bristle
(20) male cerci modified in long, slender and pointed processes below anal opening
(21) phallophore long and rather projecting down and backwards, though not forming true epiphallus
(22) postgonite relatively short and short haired
(23) ejaculatory apodeme absent
(24) distiphallus apically funnel-shaped
(25) female *T8* not divided but medially often paler pigmented
(26) female *T9* as long as wide, triangular, with a pair of hairs
(27) female *S8* reduced to a small, more or less rounded plate
(28) female *S9* short, horseshoe-shaped or divided into 2 sclerites
(29) spermathecae roughly pear-shaped
(30) female cerci long, slender, with 2 long wavy hairs and some shorter hairs.

Discussion: The most significant and probably autapomorphic features distinguishing the genus *Herniosina* gen. nov. from all related genera are: male *S1+2* with convex bulge, strongly reduced male *S5*, male cerci modified in long and slender projections, backwards projecting phallophore and (plesiomorphic) narrow, retractile female postabdomen. The genus *Herniosina* belongs to the *Limosina* genera-group but formation of its female postabdomen indicate the relationship also to *Minilimosina* genera-group. Therefore *Herniosina* is thought to be an important group demonstrating the evolution of the *Limosina* genera-group and *Minilimosina* genera-group from common ancestor. For a more detailed analysis see the chapter "Phylogeny". *Herniosina* shares with *Limosina* and *Gigalimosina* a similarly shaped R_{4+5} not overpassed by *C*, long phallophore, reduced female *S8* and *S9* and similar spermathecae. With *Apteromyia*, the remaining genus of the above group, it has a similarly formed periandrium, male cerci and t_2 chaetotaxy in addition.

The genus *Herniosina* includes two species in Europe, viz. *H. bequaerti* (VILLENEUVE, 1917) and *H. horrida* (ROHÁČEK, 1978). As far as other Palaearctic species are concerned, none of them seems to belong to this genus. The same applies to all described Nearctic species.

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Key to European species

1 Male *S5* (Fig. 108) with robust, apically bifurcate projection, in lateral view s-shaped (see Fig. 106). Male cerci modified in slender processes about half length of telomere, each carrying short bristle (Fig. 117). Aedeagal apodeme extremely enlarged. Postgonite shorter (Fig. 115), telomere as in Fig. 118. Female *S9* divided into 2 lateral plates (Fig. 121) . . . . . *H. bequaerti* (VILLENEUVE)

— Male *S5* (Fig. 110) with only 2 small, finger-like processes. Male cerci modified in very long, slender processes, nearly as long as telomere (Fig. 129), each carrying a long, downward curved bristle. Aedeagal apodeme not enlarged. Postgonite longer (Fig. 126), telomere as in Fig. 127. Female *S9* horseshoe-shaped (Fig. 132) . . . . . *H. horrida* (ROHÁČEK)

Herniosina bequaerti (VILLENEUVE, 1917), **comb. nov.**

(Figs. 106–108, 111–121)

Leptocera (*Limosina*) *Bequaerti* VILLENEUVE, 1917: 143; RICHARDS, 1930: 292
Leptocera (*Scotophilella*) *Bequaerti*: DUDA, 1925: 154, 157 (key)
Leptocera Bequaerti: SÉGUY, 1934: 464; NARTSHUK, 1970: 348 (key)
Limosina (*Limosina*) *Bequaerti*: DUDA, 1938: 110
Limosina bequaerti: PAPP, 1973c: 46 (key); ROHÁČEK, 1978a: 55
Limosina (*Scotophilella*) *herniata* DUDA, 1918: 108

Type material:
Leptocera (*Limosina*) *Bequaerti* VILLENEUVE: Described from a series of specimens taken by M. BEQUAERT in St. Pieterst berg (Holland) in company with *Terrilimosina racovitzai* (BEZZI) (VILLENEUVE, 1917). Location of types unknown (no-examined).
Limosina (*Scotophilella*) *herniata* DUDA: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "Styriae Alpes STROBL", "*L. rufilabris* STENH. ♂ 23/9", "52 138" and "nova spec. *herniata* mihi det DUDA" (pink label), deposited in ZMB; Paralectotypes 2♀ labelled: "No. 200 Wypustek" and "*herniata* ♀ det DUDA" (MMB).

Material examined (besides "Type material"): 32 ♂ 34 ♀

Belgium: 5 ♂ 5 ♀ (IRB) — localities given by ROHÁČEK (1978a).

Czechoslovakia: 26 ♂ 28 ♀ (JRO, SMO, NMP) — Bohemia: localities given by ROHÁČEK (1978a); Moravia: Hradec n. M., H. Jeseník Mts.-Rejvíz (ROHÁČEK leg.) and localities given by ROHÁČEK (1978a, 1980); Slovakia: Belanské Tatry Mts.-Šarpanec (ROHÁČEK leg.).

Italy: 1 ♂ (MCV) — Prealpi Venete Mts.-col. Visentin (PAOLETTI leg.).

Finland: 1 ♀ (ZMH) — N: Helsinki (HELLÉN leg.).

Description:
Male. Total body length 2.26–2.70 mm, general colour blackish brown to black, shiny. Head brownish black. Anterior margin of frons yellowish brown, the rest of frons blackish brown. Frontal triangle narrow, prolonged anteriorly and blackish dusted, dull. Ocellar triangle, occiput, orbits and the rest of frons shining, somewhat silvery dusted. *pvt* absent; 4 (rarely 5) *if*, the most posterior and anterior usually shorter; 3–5 small *ads* inside and below *ors*. Frontal lunule basally, face and anterior part of gena pale or yellowish brown; frontal lunule anteriorly dark brown and greyish dusted, facial cavity blackish brown, shiny. *g* relatively small. Eye rather small, its diameter about 2.3 times the smallest genal width. Antennae blackish brown; arista about 3.8–4.0 times as long as antenna and relatively long ciliate.

Thorax brownish black, sparsely dusted and shiny, only pleurae more heavily pruinose and duller. 2 *dc*, the anterior short; *ac* hairs in 8 rows between anterior *dc*, the medial prescutellar *ac* pair distinctly enlarged and about 3 times as long as other *ac* microsetae. Sutures between pleural sclerites yellowish brown. 2 *stpl*, the anterior reduced to a minute, almost indistinct hair. Scutellum large, rounded triangular, *sc* long. Legs blackish brown, trochanters, knees and tarsi pale yellowish brown. t_2 chaetotaxy as in Fig. 113, ventrally with a regular row of short, black spines, the most distal of which is the reduced *va*. Some additional curved short spines round the last mentioned bristle. Ratio $t_2 : mt_2 = 2.08–2.19$. mt_3 with a small ventroapical hook hidden in the hairs. Wing (Fig. 114) with pale brownish membrane, veins brown, *C* darkest. *C* not extending beyond R_{4+5}. R_{4+5} slightly sinuate, apically almost straight. Discal cell long, its anterior outer corner with very short pigmented process of M_{1+2} beyond t_p, hind corner usually more or less rounded and without venal appendage. Alula narrow but not pointed. Wing measurements: length 1.87–2.34 mm, width 0.79–0.99 mm, *C*-index = 0.87–1.23, $t_a – t_p : t_p = 3.77–4.90$. PAPP & PLACHTER (1976) refer to a specimen with distinctly reduced wings. Halteres with yellowish brown stem and blackish brown knob.

Abdomen very sparsely haired (including sternal part) and glabrous, shiny. *T1+2* simply pigmented and sclerotized, *T3*, *T4*, *S3*, *S4* without any pruinosity, other sclerites scarcely pruinose. *S1+2* of form typical for the genus, thus convex, bulge-like (Fig. 106). *S5* (Fig. 108) reduced to a short, transverse band and only laterally weakly sclerotized. The middle membraneous part carrying a robust projection, in lateral view s-shaped, with shortly bifurcate apex. On each of its apical processes 3 small setulae. Apex of abdomen strikingly down curved in consequence of the very strongly developed *T5* and *S7*.

Genitalia. Periandrium (Figs. 116, 117) relatively shortly haired, with a longer dorsolateral hair and a row of long lateral bristles ventrally. Cerci each modified in slender and pointed projection, about half length of telomere, and carrying a short bristle. Hypandrium very long, slender, rod-like. Telomere (Fig. 118) rather large, more or less oblong in profile, sparsely haired. Aedeagal complex (Fig. 115) with gigantic aedeagal apodeme extending very far into abdomen. Aedeagus short compared with aedeagal apodeme. Phallophore long, projecting back and downwards. Distiphallus apically funnel-shaped, postgonite robust, short, with a tubercle on anterior margin overgrown by 4 minute setulae; pointed apex of postgonite with some small tubercles. Ejaculatory apodeme not observed.

Female. Head, thorax, legs and wing as in the male unless mentioned otherwise. Total body length 2.22–3.05 mm, t_2 with all bristles of dorsal side somewhat longer (Figs. 111, 112) and ventrally with only a long *va*. The anteroapical bristle (marked by arrow on Fig. 112) much longer than in male. Ratio $t_2 : mt_2 = 1.68–1.89$. Wing measurements: length 2.02 to 2.50 mm, width 0.83–1.07 mm, *C*-index = 1.08–1.27, $t_a – t_p : t_p = 3.55–4.33$. Preabdomen different to that of the male. Terga sparsely haired, scarcely pollinose (*T3* and *T4* entirely without pruinosity) and shiny. Sterna (including *S1+2*) unmodified, greyish brown pollinose, more densely haired and slightly shiny.

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Postabdomen (Figs. 119–121) more pruinose, subshiny. *T8* with more or less distinctly incised anterior margin. *T9* triangular, pigmented only basally, finely pubescent and with a pair of dorsal hairs. *S7* with medial incision on posterior margin (a small, darkly pigmented structure in this incision as figured in Fig. 121, is only sometimes developed). *S8* reduced to a small, roundly trapezoid plate with some minute setulae. *S9* divided into 2 lateral, strongly sclerotized, darkly pigmented and finely pubescent sclerites. The membrane connecting these sclerites also finely haired. Spermathecae (Fig. 107) of about pear-shaped form, with short sclerotized ducts. Cerci long, slender, each with 2 long sinuate hairs (apical and dorsopreapical) and some shorter hairs.

Preimaginal stages: GODDARD (1938: 240, Fig. 2) described and figured the puparium of this species. It somewhat resembles that of *Limosina silvatica*, especially in its shortly palmate anterior spiracles. The described puparia probably actually belong to *H. bequaerti* and not to *H. horrida* as they were reared from larvae collected in a mouse run.

Discussion: VILLENEUVE (1917) stated that his type series was found together with *Terrilimosina racovitzai* (BEZZI). This is, in my opinion, enough reason for considering *H. bequaerti* to be identical with the above described species, though the type material has not been examined. Occurrence with *T. racovitzai* indicates that the type series was collected in a cave, thus it cannot be *H. horrida* which has quite different biology (see below).

Limosina herniata DUDA is synonymous with *H. bequaerti* (VILLENEUVE). I have examined 3 syntypes of it; the syntypic male, perfectly agreeing with the original description, was designated as the lectotype. Although all 3 revised syntypes are conspecific, it is possible that some other syntypic specimens of *L. herniata* DUDA belong to *H. horrida* (ROHÁČEK). However, DUDA's (1918, 1938) descriptions of the male external genitalia corresponds perfectly with that of *H. bequaerti* (cf. ROHÁČEK, 1978a: 57). Moreover, DUDA (1924b) stated that VILLENEUVE had studied his types of *L. herniata* and found them to be identical with *H. bequaerti* (VILLENEUVE).

Biology: The species occurs mainly in caves (CZIŽEK, 1916; DUDA, 1918, 1938; PAPP & PLACHTER, 1976) and cellars (PAX & MASCHKE, 1935; ROHÁČEK, 1978a), more rarely in burrows of rabbits, rats (*Rattus norvegicus*), moles (*Talpa europaea*) and *Arvicola terrestris* (DUDA, 1918; RICHARDS, 1930; ROHÁČEK, 1978a). I have some records also from nests of *Microtus* sp. ROHÁČEK (1980) found some specimens by soil traps.

PAPP & PLACHTER (1976) found it only in the largest caves (in their inner aphotic parts) and classified it as troglophilous species. However, a relatively common occurrence of *H. bequaerti* in cellars (accompanied similarly as in caves by *Terrilimosina racovitzai* and *Apteromyia claviventris* — cf. ROHÁČEK, 1978a) would be considered as a special case of the synanthropy and the species (more exactly its cellar populations) classified as hemisynanthropic one (see the chapter "Biology"). It is not quite impossible that the synanthropic populations of this obviously originally cave-dwelling species have an old (prehistorical) origin.

According to the study of PAPP & PLACHTER (1976) the species is obviously polysaprophagous without any special preference of feeding substrate. Larvae consume dead animals, rotten wood, decayed vegetation or mycelia of fungi. Duration of the life-history (from egg to imago) is 70–90 days; the imago lives an average of 38 days. Puparium lasted 16–18 days (GODDARD, 1938). In caves and cellars the species develops continuously during the whole year.

Distribution: Hitherto only in Europe — GB: England (RICHARDS, 1930, 1976; GODDARD, 1938) and Scotland (PAPP, 1978b); The Netherlands (VILLENEUVE, 1917; DUDA, 1918); Belgium (VANSCHUYTBROECK, 1942; ROHÁČEK, 1978a); FRG (PAPP & PLACHTER, 1976); GDR (DUDA, 1918); Czechoslovakia (CZIŽEK, 1916, 1925; DUDA, 1918; PAX & MASCHKE, 1935; ROHÁČEK, 1978a, b, 1980); Austria (DUDA, 1918), Hungary (PAPP, 1973c; PAPP & PLACHTER, 1976); Italy (material examined, new); Finland (FREY, 1941).

Herniosina horrida (ROHÁČEK, 1978), **comb. nov.**

(Figs. 109, 110, 122–132)

Limosina horrida ROHÁČEK, 1978a: 51

Type material: Holotype ♂: Czechoslovakia, Slovakia, Velká Fatra Mts., Suchá dolina (valley), 27. 6. 1975, on decayed hay, J. ROHÁČEK leg. (JRO); allotype ♀ and 7 ♂ 11 ♀ paratypes: same data as for holotype (2 ♂ 3 ♀ deposited in TMB); other paratypes: 1 ♀ Czechoslovakia, Moravia, Hynčice pod Sušinou (distr. Šumperk), 13. 5. 1973, sifting leaves, B. MOCEK leg. (JRO); 2 ♀ Moravia, Nýznerov env., 25. 5.–6. 7. 1977, soil trap (SMO); 2 ♂ 12 ♀ Moravia, Nová Lublice env. (distr. Opava), 30. 4. 1977, sifted from decayed hay in wood; 1 ♀ Moravia, Jánské Koupele (distr. Opava), 30. 4. 1977, sifting drifted vegetable refuse by Moravice-river, all J. ROHÁČEK leg.; 2 ♀ Moravia, Tišnov-Květnice, 31. 3. 1973, sifting leaves, B. MOCEK leg.; 1 ♂ Slovakia, Slovenský Kras, Zadielský kaňon (valley), 30. 7. 1974, sifting leaves in deciduous

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forest; 4 ♂ Slovakia, Vysoké Tatry Mts., Mengusovská dolina (valley), 7. 5. 1977, on decayed grass by small stream, all J. ROHÁČEK leg. (JRO).

Material examined (besides „Type material"): 1 ♂ 6 ♀

Czechoslovakia: 1 ♂ 6 ♀ (JRO, SMO) – Moravia: H. Jeseník Mts.-Skřítek, Dol.Bušínov (ROHÁČEK leg.); Slovakia: Branisko Mts. (BENEŠ leg.), Belanské Tatry Mts.-Tristárska dolina, Dolina siedmi prameňov (ROHÁČEK leg.).

Description:

Male. Total body length 2.06–2.46 mm (in alcohol). General colour blackish brown, shiny, only slightly pollinose. Head blackish brown, frons yellowish brown anteriorly, also anterior part of gena paler. Frontal triangle narrow, prolonged anteriorly, interfrontalia distinct. *pvt* absent; 4–5 *if*, 3 posterior strong, 1–2 anterior small; 1–4 small *ads* inside *ors*. Frontal lunule and facial cavity dark brown. Genal width about half of the eye diameter, *g* weak. Antennae brown, arista about 4.7 times as long as the antenna, medium long ciliate.

Thorax blackish brown, mesonotum shiny, sparsely pollinose. Thoracic chaetotaxy as defined for the genus. 2 *dc*; 6–8 rows of *ac* hairs, the innermost prescutellar *ac* pair about twice as long as other *ac* hairs. Pleurae blackish brown, more pruinose and duller. Scutellum rounded triangular. Legs blackish brown, trochanters, knees and tarsi paler. t_2 chaetotaxy as in Fig. 124, ventrally with a comb-like row of short spines, terminated by very reduced *va*. Ratio $t_2 : mt_2 = 1.77–2.05$. mt_3 ventrally with a minute ventroapical hook, hidden in hairs. Wing (Fig. 125) pale yellowish brown, veins brown. *C* not extending beyond R_{4+5}. R_{4+5} slightly sinuate, apical part almost straight, ending nearer the apex of wing than unpigmented part of M_{1+2}. Discal cell rather long, with both outer corners obtuse-angled, hind corner usually less rounded than in *H. bequaerti*. Coloured venal process of M_{1+2} very short, that of M_{3+4} not developed. Alula small and narrow. Wing measurements: length 1.91–2.14 mm, width 0.79–0.91 mm, *C*-index = 0.73–1.02, $t_a – t_p : t_p = 3.07–3.83$. Halteres brown, stem paler.

Abdomen blackish brown, shiny, dorsally and ventrally only sparsely haired. *T1+2* simply pigmented and very sparsely pollinose, *T3* and *T4* entirely shiny and glabrous. Sterna also strikingly glabrous and shiny. *T5* and *S7* very large and hence the apex of abdomen strongly down-curved. *S1+2* similarly as in *H. bequaerti* with large convex bulge and a pair of long bristles on hind margin. Similar long bristles also on posterior margins of *S3* and *S4*. *S5* (Fig. 110) very short, transversely band-shaped, weakly sclerotized, medially in front of posterior margin with a pair of short, apically haired projections, and some longer bristles in both lateral, more sclerotized parts.

Genitalia. Periandrium (Figs. 128, 129) with a longer dorsolateral bristle and a row of long, backwardly directed bristles near lower margin. Cerci modified in strikingly long, slender, double processes, each carrying a long curved bristle. Hypandrium simple rod-like, considerably shorter than that of *H. bequaerti*. Telomere (Fig. 127) with a long bristle arising on pointed process at its fore margin and with a slender, downwardly curved interior projection. Aedeagal complex (Fig. 126). Aedeagal apodeme in comparison with that of *H. bequaerti* short, not enormously enlarged. Phallophore back and downwardly curved, hook-like; distiphallus generally similar to that of *H. bequaerti*, apically funnel-shaped, but differing in details. Postgonite wholly differently formed compared to that of *H. bequaerti*, longer and more slender, with 2 setulae on projection in basal third of anterior margin, another minute setulae on anterior as well as posterior margins. Ejaculatory apodeme not found.

Female. Head, thorax, legs and wing as in the male unless mentioned otherwise. Total body length 2.34–2.90 mm (in alcohol). t_2 chaetotaxy as in Figs. 122, 123, thus ventrally with only a long *va*. All bristles of t_2 somewhat longer than in male, especially the anteroapical bristle much longer (Fig. 123). Ratio $t_2 : mt_2 = 1.61–1.94$. Wing measurements: length 1.98–2.42 mm, width 0.79–0.95 mm, *C*-index = 0.73–1.03 mm, $t_a – t_p : t_p = 3.08–3.83$. Preabdomen not modified in comparison with the male, with shiny, sparsely haired terga of which *T3* and *T4* entirely glabrous, without pruinosity; *T1+2* and *T5* very sparsely pruinose but shiny. Sterna more densely haired and pruinose.

Postabdomen (Fig. 130–132) long, retractile, narrow. *T6–T8* shiny, *T9* densely pubescent and pollinose. *T8* medially usually distinctly paler pigmented. *T9* with a pair of hair-like dorsal bristles. *S7* simple, with a pair of longer medial bristles in front of posterior margin. *S8* small, transversely oval, compared with *S7* relatively larger than that of *H. bequaerti*, with a pair of thin bristles at posterior margin. *S9* horseshoe-shaped, not separated into 2 sclerites, finely pubescent and bearing some longer hairs on posterior margin. Spermathecae (Fig. 109) similar to those of *H. bequaerti*, roughly pear-shaped, but the sclerotized parts of their ducts distinctly longer (cf. the distance between spermatheca and fusion of ducts of the paired spermathecae). Cerci long, slender, haired as in *H. bequaerti*, the dorsopreapical sinuate hair somewhat longer.

Discussion: *H. horrida* (ROHÁČEK) is very closely related to *H. bequaerti* (VILLENEUVE) and differs from it mainly in details of the male genitalia and female postabdomen (see key). Besides this, there are also distinct differences in the biology of these species.

Because of great similarity of these species, it is possible that DUDA (1918) included in his series of *Limosina herniata* (syn. of *H. bequaerti*) some specimens of *H. horrida*, though his description of the male genitalia is unambiguously that of *H. bequaerti* (cf. ROHÁČEK, 1978a). On the other hand, *H. bequaerti* was probably described from a series collected in cave (see discussion under this species) and therefore it seems to highly improbable to include *H. horrida*, which has not been found in caves up to the present.

Biology: Almost all the material examined was caught on decayed hay, grass or sifted from leaves in deciduous forests (ROHÁČEK, 1978a). Some specimens were obtained also by the soil traps (ROHÁČEK, 1980). Adults were recorded for months III–VII. It is interesting that *H. horrida* was never found in company with *H. bequaerti* in caves, cellars or burrows of small mammals. The exclusive occurrence of this species in decaying herbaceous material is thought to be a good reason for considering it as phytosaprophagous species.

Distribution: Czechoslovakia (ROHÁČEK, 1978a, 1980).

5. Genus *Terrilimosina* gen. nov.

Group of *L. schmitzi* DUDA: RICHARDS, 1930: 292
Type species: *Limosina Racovitzai* BEZZI, 1911

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Diagnosis: The genus can be defined as follows.
(1) *pvt* absent
(2) 4—5 *if*
(3) 2—7 small *ads* inside and below *ors*
(4) *g* short, weak
(5) arista long ciliate
(6) 2 *hu*, the internal hardly longer than *ac* microsetae
(7) 1—2 *dc* (if 2 *dc* present then the anterior very short)
(8) 8—10 rows of *ac* hairs in front of suture
(9) 2 *stpl*, the anterior minute, hair-like
(10) scutellum long, rounded triangular, *sc* long
(11) t_2 chaetotaxy (see Figs. 167—169), in *T. racovitzai* somewhat aberrant (Figs. 135—137)
(12) *C* extending far beyond R_{4+5}
(13) R_{4+5} sinuate, almost straight apically
(14) discal cell long, posterior outer corner rounded, always without pigmented process of M_{3+4} beyond t_p
(15) alula large with rounded apex
(16) female postabdomen distinctly narrower than preabdomen, long, telescopically retractile
(17) male *S5* simple or with prominent structures
(18) periandrium with a long dorsolateral hair-like bristle
(19) male cerci well developed, each with one longer hair
(20) hypandrium always short
(21) telomere with a comb of blunt spines internally
(22) phallophore strongly reduced, frame-like
(23) epiphallus not developed
(24) postgonite and distiphallus rather variable
(25) ejaculatory apodeme absent
(26) female *T8* not divided but with a tripartite pigmentation
(27) female *T9* long and narrow as a rule, with exception of that of *T. racovitzai*
(28) female *S8* relatively little reduced
(29) female *S9* large, broad, wider than *T9*
(30) spermathecae conical to cylindrical, with impressed tips
(31) female cerci long, with long undulating hairs.

Discussion: The genus *Terrilimosina* gen. nov. belongs to the *Minilimosina* genera-group. There is a number of features which it shares with the remaining genera of *Minilimosina* genera-group, e.g. similar t_2 chaetotaxy in *T. racovitzai*, *C* extending far beyond R_{4+5}, retractile female postabdomen, long and narrow female *T9*, large female *S9* and large and long haired female cerci.

On the other hand, *Terrilimosina* appears to be rather aberrant member of the above group being distinguished by some fairly progressive features (strongly reduced phallophore, short hypandrium, enlarged alula, dorsolateral hair on periandrium) combined with apparently plesiomorphic characters (relatively large female *S8*, well differentiated male cerci, t_2 chaetotaxy — *av* below middle in more primitive species). Although *Terrilimosina* indicates some affinities to *Herniosina*, it cannot be regarded as its direct ancestor because of the strongly reduced phallophore, hypandrium, and enlarged alula, i.e. apomorphic characters not occurring in *Herniosina*. For further details of the relationships of *Terrilimosina* see chapter "Phylogeny".

The genus *Terrilimosina* includes 3 species in Europe — *T. racovitzai* (BEZZI, 1911), *T. sudetica* (ROHÁČEK, 1975) and *T. schmitzi* (DUDA, 1918). On the basis of the descriptions, it is hardly possible to place any other Palaearctic or Nearctic species in this genus. DEEMING (1969) recorded 2 uncertainly determined species near to *T. schmitzi* — they are probably valid species and appear to be *Terrilimosina*. An examination of the male genitalia is necessary to demonstrate their affinity with *Terrilimosina* without doubts.

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Key to European species

1 Eye small (Fig. 134), its diameter less than 1.5 times the smallest genal width. t_2 without *av* in apical two-fifths, in male with double row of short spines ventrally (Figs. 136, 137). Male *S5* simple but *S6* with a deeply bifurcate projection (Fig. 144); genitalia with very short postgonite, large and partly membraneous distiphallus (Fig. 139); also telomere rather characteristic (Fig. 140). Female *T9* broad (Fig. 146) . . . . . *T. racovitzai* (BEZZI)

— Eye normal (Fig. 133), its diameter usually more than 3 times the smallest genal width. t_2 with *av* in apical two-fifths in both sexes (Figs. 168, 169). Male *S6* simple. Genitalia with long postgonite, smaller distiphallus and different telomere. Female *T9* long and narrow (Figs. 161, 164) 2

2(1) Wing short, more or less distinctly reduced, in dry specimens always shorter than total body length. Alula smaller (Figs. 152, 153). *T1+2* with tripartite pigmentation (Fig. 159). Male *S5* with a distinctive medial structure on posterior margin (Fig. 160), telomere (Figs. 155, 156) bilobed, aedeagal complex as in Fig. 154. Female *T9* unhaired, *S9* characteristically widened posteriorly (Fig. 162), spermathecae conical (Fig. 163), cerci very robust (Fig. 161) . . . . . *T. sudetica* (ROHÁČEK)

— Wing long, always longer (in dry specimens) than total body length. Alula larger (Fig. 170). *T1+2* simply pigmented. Male *S5* without any medial structure posteriorly, telomere simple, subquadrate (Figs. 171, 172), aedeagal complex as in Fig. 175. Female *T9* with a pair of dorsal bristles, *S9* not widened posteriorly, spermathecae cylindrical, cerci longer and more slender (Fig. 164—166) . . . . . *T. schmitzi* (DUDA)

Terrilimosina racovitzai (BEZZI, 1911), comb. nov.

(Figs. 134—148)

Limosina Racovitzai BEZZI, 1911: 66
Limosina (*Scotophilella*) *Racovitzai*: DUDA, 1918: 113
Leptocera (*Scotophilella*) *Racovitzai*: DUDA, 1925: 155 (key)
Leptocera racovitzai: SÉGUY, 1934: 469; NARTSHUK, 1970: 346 (key)
Limosina (*Limosina*) *Racovitzai*: DUDA, 1938: 142
Limosina Rakovitzai: PAPP, 1973c: 49 (key)
Limosina mikrops DUDA in CZIŽEK, 1916: 49
Limosina (*Scotophilella*) *Racovitzai* var. *microps* (emend.): DUDA, 1918: 36 (key)
Leptocera (*Scotophilella*) *Racovitzai* var. *microps*: DUDA, 1925: 155 (key)
Leptocera (*Limosina*) *Racovitzai* var. *microps*: RICHARDS, 1930: 292
Limosina (*Limosina*) *Racovitzai* var. *microps*: DUDA, 1938: 143
Limosina (*Scotophilella*) *Racovitzai* var. *Pokornyi* DUDA, 1918: 113

Type material:
Limosina Racovitzai BEZZI: Described from a long series of specimens collected by M. RACOVITZA from localities: Grotte de la Garosse à La-Bastide-de-Sérou; Ruisseau souterrain d'Aulot à Saint-Girons; Grotte de Neuf-Fonts à Aulus; Grotte d'Izeste ou d'Arudy à Arudy; Baoumo de Pasques à Collias; Gouffre de Padivac à Padivac; Catacombes de Bicêtre au Kremlin-Bicêtre (BEZZI, 1911) (not examined). No types are preserved in the BEZZI's collection (MCM) (Dr. C. LEONARDI, letter communication, 1979) and depository of the collection of M. RACOVITZA has not been discovered.
Limosina mikrops DUDA: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "140. 25. V. 1915 Ochoser Höhle", "*mikrops* m ♂ det. DUDA" and "*Limosina racowitzai* BEZZI ♂ J. ROHÁČEK det." (MMB, inv. no. 1624/Ent.); Paralectotype ♀ labelled: "151. 25. V. 1915 Ochoser Höhle", "*mikrops* m ♂ ♀ det. DUDA" and "*Limosina racowitzai* BEZZI ♀ J. ROHÁČEK det." (inv. no. 1623/Ent., MMB).
Limosina (*Scotophilella*) *Racovitzai* var. *Pokornyi* DUDA: Lectotype ♂ (designated by ROHÁČEK in 1979) labelled: „Agtelbarlg" (on green label) and "*mikrops* ♂ det. DUDA"; paralectotype ♀ with same locality label but without determination label (both TMB). The specimens were originally identified by DUDA as "*mikrops*" but described as variety of *L. Racovitzai* (cf. DUDA, 1918: 115).

Material examined (besides "Type material"): 29 ♂ 41 ♀

FRG: 2 ♂ 2 ♀ (ZMB) — Klutert (cave), Wihl Höhle (DUDA leg.).

Czechoslovakia: 26 ♂ 37 ♀ (JRO, SMO, PFB, NMP) — Bohemia: Palupín nr. Strmilov (ROHÁČEK leg.); Moravia: Otín nr. Stonařov, Valtice (ROHÁČEK leg.), Komorní Lhotka (HETSCHKO leg.).

Hungary: 1 ♀ (ZMB) — Bp. Hárshegy (BOKOR leg.).

Bulgaria: 1 ♀ (IZS) — Pest. Ruschova (cave) nr. Gradeschniza (TRANTEEV leg.).

USSR: 1 ♂ (ZMH) — Ib: Hogland (HELLÉN leg.).

Description:
Male. Total body length 1.35—1.79 mm, general colour dark brown. Head (Fig. 134). Frons blackish brown, with paler anterior margin; frontal triangle large, shiny. Interfrontalia and narrow orbital stripes finely silvery dusted. *pvt* absent; 4 (rarely 5) *if*, the most anterior shorter; 5—6 *ads*. Frontal lunule pale brownish yellow, grey dusted; facial cavity brown, shiny. Gena large, with a small *g* and shiny triangular spot below eye, otherwise brown dusted. Eye reduced (Fig. 134), its diameter about 1.4 times the smallest genal width. Some small hairs on face and gena below eye. Antennae strongly diver-

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gent, blackish except for the 3rd segment being brown and rather long pubescent. Arista about 3.8—4.0 times as long as antenna, very long ciliate.

Thorax dark brown, subshiny, pleurae heavily dusted and dull. Thoracic chaetotaxy as defined for the genus; 1 *dc* in prescutellar position, *dc* microsetae in front of it somewhat longer than *ac* hairs. Usually 8 rows of *ac* microsetae, the medial prescutellar *ac* pair enlarged. Sutures between pleural sclerites paler yellowish brown. Scutellum rounded triangular, with long *sc*. Legs brown, tibiae paler brownish, fore coxae, trochanters, knees and tarsi brownish yellow. t_2 chaetotaxy as in Fig. 137, ventrally with double row of short spines, *va* reduced. Ratio $t_2 : mt_2 = 1.60-1.82$. Wing (Fig. 138) with pale brownish membrane, veins brown. *C* extending beyond R_{4+5}. R_{4+5} sinuate, almost straight apically. Discal cell rather long, with posterior outer corner rounded (rarely obtuse-angled), anterior corner with a minute pigmented appendage of M_{1+2} beyond t_p continued by colourless fold. Alula large, rounded. Wing measurements: length 1.32—1.82 mm, width 0.53 to 0.79 mm, *C*-index = 0.92—1.05, $t_a-t_p : t_p = 3.25-4.62$. Halteres yellowish brown, stem paler yellowish, knob darker brownish.

Abdomen brown, somewhat weakly sclerotized, brownish dusted, subshiny. Terga sparsely, sterna more densely haired. *S5* simple, without prominent structures, rather densely haired. On the other hand, *S6* (Fig. 144) with distinctive bifurcate projection, situated medially behind posterior margin of *S5* and evidently functionally replacing the specialized structures being normally developed on this sternum.

Genitalia. Periandrium (Fig. 142, 143) of medium size, sparsely haired, with a long dorsolateral hair. Cerci distinct, not large, each with a longer bristle and some small hairs. Hypandrium small, flat (Fig. 141). Telomere (Fig. 140) relatively long, bilobed. Its anterior lobe slender, with about 4 spines at apex; the posterior lobe larger, with some longer bristles and ventrally with a comb of 4 blunt, slightly curved spines and one long spike. Aedeagal complex with extremely reduced frame-like phallophore (Fig. 139), large and only dorsally and ventrally sclerotized distiphallus with finely haired apex and unusually short postgonite with some minute setulae subapically. Ejaculatory apodeme not found.

Female. Similar to male but differs as follows. Total body length 1.63—2.22 mm. t_2 chaetotaxy (Fig. 135, 136) ventrally different, with only *va*. Ratio $t_2 : mt_2 = 1.56-1.76$. Wing measurements: length 1.51—2.03 mm, width 0.62—0.79 mm, *C*-index = 0.87—1.11, $t_a-t_p : t_p = 4.33-5.25$. Abdomen (Fig. 145) with somewhat reduced terga and sterna and very extensible pleural membraneous parts making possible a large distension of abdomen in gravid females. Thus, the so-called "physogastrous" abdomen of females of this species is due to its numerous and relatively large-sized eggs.

Postabdomen (Figs. 146, 147) retractile into preabdomen. *T8* not divided but dorsally with tripartite pigmentation. *T9* in comparison with related species wide (about as long was wide), with a pair of dorsal hairs. *S8* relatively large, posteriorly slightly emarginate. *S9* large, transversely oblong, with a pair of longer ventral bristles. Spermathecae (Fig.148) roughly conical, their tips (bases of cones) impressed. Sclerotized spermathecal ducts slender and somewhat dilated at the point of their fusion with membraneous ducts. Cerci robust, each with a long sinuate apical and shorter ventropreapical hair; similar sinuate dorsointernal hair situated unusually close to base of cercus.

Discussion: The species is a rather aberrant representative of *Terrilimosina* and is considered to be the most phylogenetically advanced species of the genus. To demonstrate this assertion, the following (apparently apomorphic) features can be noted: absence of *av* below middle of t_2 in female and ventral double row of short spines in male, male *S6* with peculiar bifurcate projection, extremely reduced phallophore, enlarged distiphallus and short postgonite, reduced female abdominal terga and broad female *T9*. Besides this, *T. racovitzai* (BEZZI) is easily recognizable by its reduced eyes. On the contrary, there is a number of characters demonstrating its relationship with the remaining species of the genus, especially with *T. sudetica* (ROHÁČEK) — e.g. bilobed telomere, haired apex of distiphallus, almost identical spermathecae, wing venation.

T. racovitzai was described from a series originating from caves and containing females with dilated abdomina (BEZZI, 1911). DUDA in CZIŽEK (1916) described *Limosina mikrops* which he later (DUDA, 1918) considered to be a darker colour variety of *Limosina racovitzai* and described another paler brown variety (var. *Pokornyi*) in addition. However, in 1938 he wholly omitted the last mentioned variety and applied the name var. *microps* to non-cavernicolous and non-physogastric specimens, thus stressing his previous supposition (DUDA, 1918) that the "physogastry" is limited to only the cave-dwelling typical form. However, as was described above (Fig. 145), only the gravid females have distinctly enlarged abdomina and the partial reduction of terga is visible after maceration also in non-physogastric specimens. In my opinion, DUDA had examined material from caves preserved in alcohol and thus with swollen female abdomina, while his pinned dry specimens (with unnaturally contracted abdomina) had originated from another habitats. Both *Limosina mikrops* DUDA, and *Limosina racovitzai* var. *Pokornyi* DUDA are intraspecific variability of *T. racovitzai* (BEZZI) and hence they were synonymized with this species by ROHÁČEK (1981).

Biology: A common cave-dwelling species (BEZZI, 1911, 1914; DUDA, 1918, 1928, 1938; RICHARDS, 1961; BESHOVSKI, 1972; PAPP, 1973c) classified by PAPP & PLACHTER (1976) as troglophilous. According to PAPP & PLACHTER (1976), the species lives in the inner aphotic parts of caves, often in company with *Herniosina bequaerti* (VILLENEUVE). Larvae were found to be polysaprophagous, feeding in carrion, rotten wood, decayed vegetation and mycelia of fungi. Females lay 50—60 eggs, duration of the life-history is 70—90 days. The species develops continuously during the whole year, and its abundance depends on the quantity of suitable decaying matter in cave.

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In addition, *T. racovitzai* was caught rarely in the mole (*Talpa europaea*) nests, once in nest of *Vespa* sp. (RICHARDS, 1930) and in cellars and mine-galleries (PAX & MASCHKE, 1935). I have also discovered several populations of this fly in country cellars developing in decayed potatoes and other vegetables. I consider these populations as hemisynanthropic and similar to those I have described of *Herniosina bequaerti*. It is necessary to mention that the cellar populations are mostly more numerous and their density is always much higher than that of wild cave populations as they are concentrated in relatively small spaces containing as a rule abundant feeding substrate for larvae.

Distribution: The species is widespread in Europe. Recorded from GB: England (RICHARDS, 1930, 1976), France (BEZZI, 1911, 1914; SÉGUY, 1934), The Netherlands (DUDA, 1918; VILLENEUVE, 1917); Belgium (BEZZI, 1914; VANSCHUYTBROECK, 1942), FRG (DUDA, 1918; PAPP & PLACHTER, 1976); GDR (DUDA, 1918), Poland (PAX & MASCHKE, 1935), Czechoslovakia (CZIŽEK, 1916; DUDA, 1918; PAX & MASCHKE, 1935; ZUSKA & LAŠTOVKA, 1969; ROHÁČEK, 1978b), Austria (DUDA, 1918), Hungary (DUDA, 1918, 1928; PAPP, 1973c; PAPP & PLACHTER, 1976), Jugoslavia (BEZZI, 1911, 1914), Bulgaria (BESHOVSKI, 1972), USSR: Ib (material examined, new). The only non-European record is from Afghanistan (RICHARDS, 1961) but it would need re-examination.

Terrilimosina sudetica (ROHÁČEK, 1975), **comb. nov.**

(Figs. 149–163)

Limosina sudetica ROHÁČEK, 1975c: 121

Type material: Holotype ♂ Czechoslovakia, Moravia, Hrubý Jeseník Mts., Kouty n. D. env., 7. 10. 1974, sifting leaves in beech forest, J. ROHÁČEK leg. (JRO); allotype ♀ same data as for holotype (JRO).

Material examined (besides "Type material"): 2 ♂ 4 ♀

Czechoslovakia: 2 ♂ 4 ♀ (JRO, SMO, TMB, IZS) – Bohemia: Doupovské hory Mts.-Lochotín, Doupov (ROHÁČEK leg.), Šumava Mts.-Boubín Mt. (BESHOVSKI leg.); Moravia: H. Jeseník Mts.-Skřítek (ROHÁČEK leg.).

Description:

Male. Total body length 1.75–2.07 mm. General colour brownish black. Head black, subshiny. Frons black pollinose, only a narrow frontal triangle shiny. Interfrontalia indistinctly separated from the rest of frons. *pvt* absent; 4 *if*, becoming shorter anteriorly; 3–5 small *ads*. Frontal lunule greyish pollinose, facial cavity black, rather shiny. Gena blackish brown, *g* short, about twice as long as peristomal hairs. Eye normal, its diameter about 3.5 times the smallest genal width. Antennae black, 3rd antennal segment brown, strikingly paler than preceding two, finely pubescent. Arista about 4 times as long as antenna, long ciliate.

Thorax blackish brown, brown dusted. Mesonotum sparsely pollinose, more shiny. Pleurae duller. Mesonotal chaetotaxy as in *T. schmitzi* – 2 *dc*, the anterior short; *ac* hairs in 8 rows. Sutures between pleural sclerites paler brown. Scutellum rounded triangular, somewhat wider than long. Legs black, coxae dark brown, trochanters and tarsi light brownish yellow, also knees paler brown. t_2 chaetotaxy as in Fig. 151, ventrally with a small *av* below middle. mt_2 with *pv* row of small spines. Ratio $t_2 : mt_2 = 1.94–2.30$. Wing somewhat reduced (Figs. 152, 153), usually not reaching beyond apex of abdomen. Membrane infuscate, veins brown. *C* distinctly overpassing R_{4+5}. R_{4+5} very slightly sinuate, almost straight apically. Discal cell long, with indistinct process of M_{1+2} beyond t_p and posterior outer corner always rounded. Alula smaller than that in *T. schmitzi*. Wing measurements: length 1.03–1.15 mm, width 0.46–0.55 mm, *C*-index = 1.08–1.15, $t_a–t_p : t_p = 3.04–3.14$. Halteres brown, stem paler.

Abdomen blackish brown, sparsely pollinose. Terga sparsely haired, rather shiny, sterna more dusted, haired and duller. *T1+2* with distinctive tripartite pigmentation (Fig. 159), twice as long as *T3*. *S5* (Fig. 160) short, transverse, medially on posterior margin with striking structure consisting of accumulated fine cuticular projections, otherwise sparsely haired.

Genitalia. Periandrium (Figs. 157, 158) slightly longer than in *T. schmitzi*, with a rather short dorsolateral bristle, otherwise shortly haired. Cerci distinctly developed, each with one long hair and 3 short setulae. Anal opening oval, small. Hypandrium short. Telomere (Figs. 155, 156) divided by ventral incision in two lobes; hind lobe posteriorly and internally, fore lobe only on inner side with a group of strong bristles and spines. Also the curved comb of blunt spines on inner side of telomere characteristic. Outer side of telomere partly finely pubescent. Aedeagal complex (Fig.154). Phallophore reduced, frame-like, produced ventrally. Distiphallus with finely spinulate apex. Postgonite proximally with 2 small setulae on anterior margin and with an interiorly haired process in the middle; several hairs also on inner side of rounded apex. Ejaculatory apodeme not observed.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 2.05 to 2.12 mm (in alcohol), 1.78–2.02 mm (dry specimens). t_2 chaetotaxy (Figs. 149, 150) as in male but bristles somewhat longer (especially *av* below middle of t_2 and *va*). Ratio $t_2 : mt_2 = 2.03–2.07$. Wing somewhat variable in length (see Figs. 152, 153) but always shorter than total body length of respective (dry) specimen. Wing measurements: length 1.13–1.70 mm, width 0.46–0.77 mm, *C*-index = 1.03–1.36, $t_a–t_p : t_p = 3.00–4.45$. Abdomen with *T1+2* pigmented as in male. *T4* distinctly narrower than *T5*.

Postabdomen (Figs. 161, 162) narrow, telescopically retractile. *T8* with tripartite pigmentation. *T9* very long and narrow, without dorsal hairs. *S8* smaller than preceding and following sterna, semicircular, with 4 long ventral bristles. *S9* very large and characteristically widened posteriorly, with some longer bristles on posterior margin. Spermathecae (Fig. 163) conical, very similar to those of *T. racovitzai*. Cerci unusually robust, as wide as *T9*, each with a long sinuate apical hair, shorter dorso- and ventropreapical hair and a small curved lateral hair.

Discussion: The species is related to *T. schmitzi* (DUDA) most closely and resembles it by t_2, head and thoracic chaetotaxy, long and internally haired postgonite, narrow female *T9* etc. However, its bilobed telomere, finely spinulate distiphallus and spermathecae also indicate its affinity to *T. racovitzai* and hence its rather intermediate position between this species and *T. schmitzi*. From these three species, *T. schmitzi* appears to be the most primitive (e.g. simple telomere, distiphallus, the least reduced phallophore, relatively

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simple female postabdomen) and *T. racovitzai* the most progressive species (see discussion under this species). *T. sudetica* is easily distinguishable from related species by features given in the key and many other details of the male genitalia and female postabdomen (Figs. 154–163).

Biology: As far as is known, this rare species seems to be terricolous and probably phytosaprophagous. Besides the types, which were sifted from leaves in beech forest, 2 ♂ were collected in decayed hay in wood, 1 ♀ under clumps of *Carex* spec., 1 ♀ in runs of *Arvicola terrestris* and 1 ♀ swept on peat-bog meadow. Occurrence dates are in months VI and X. All specimens were found at higher altitudes (700–900 m).

Distribution: Hitherto only in Czechoslovakia (Moravia – ROHÁČEK, 1975c, 1978b, Bohemia – material examined, new.).

Terrilimosina schmitzi (DUDA, 1918), **comb. nov.**

(Figs. 133, 164–176)

Limosina (*Scotophilella*) *Schmitzi* DUDA, 1918: 111
Leptocera (*Scotophilella*) *Schmitzi*: DUDA, 1925: 155 (key)
Leptocera (*Limosina*) *schmitzi*: RICHARDS, 1930: 292
Leptocera schmitzi: SÉGUY, 1934: 470; NARTSHUK, 1970: 347 (key)
Limosina (*Limosina*) *Schmitzi*: DUDA, 1938: 144
Limosina Schmitzi: PAPP, 1973c: 49 (key); ROHÁČEK, 1975c: 123
Leptocera (*Scotophilella*) *curtiventris*: SPULER, 1925b: 73 (key) nec STENHAMMAR, 1854

Type data: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "8 5 15", "Ilfeld S.-Harz DUDA" and "*Schmitzi* D. ♂ d. DUDA" (ZMB). – Paralectotypes: 5 ♂ with same labels as lectotype; 1 ♂ with same locality and determination labels but with "9 8 15" label (ZMB).

Material examined (besides "Type material"): 302 ♂ 252 ♀

Austria: 28 ♂ 14 ♀ (JRO, IZI) – Tyrol: Obergurgl Mt., Hohe Tauern-Badgastein (TROGER, STOCKNER leg.).

Czechoslovakia: 271 ♂ 231 ♀ (JRO, PFB, SMO, MHK) – Bohemia: Doupovské hory Mts.-Lochotín (ROHÁČEK leg.) Orlické hory Mts.-Říčky (MOCEK leg.); Moravia: Třešť, Mor. Kras-Býčí skála, Skalní mlýn, Holštýn, Brno-Soběšice, Hradec n. M., Klokočov, Úvalenské louky (distr. Opava), H. Jeseník Mts.-Skřítek, Kouty n. D., Hukvaldy (ROHÁČEK leg.) and localities given by ROHÁČEK (1980); Slovakia: Kremnické pohorie Mts.-Turček, V. Fatra Mts.-Krížná Mt., Suchá dolina, Belanské Tatry Mts.-Biele pleso, Dolina siedmi prameňov, V. Tatry Mts.-Mengusovská dolina, Zadiel, Kečovo (ROHÁČEK leg.).

Denmark: 2 ♂ 7 ♀ (ZMK) – EJ: Grejsdalen (MARTIN leg.); SZ: Suserup (LUNDBECK leg.); NEZ: Ordrup Mose, Holt (LUNDBECK leg.).

Finland: 1 ♂ (ZMH) – Om: Nykarleby (JUNGERSTEN leg.).

Description:

Male. Total body length 1.47–1.71 mm, general colour brownish black, sparsely greyish brown dusted, subshiny. Head almost black. Frontal triangle long, shiny black, interfrontalia very thin, silvery dusted; rest of frons blackish brown dusted and subshiny, a narrow anterior margin of frons mostly paler brown. *pvt* not developed; 4 *if*, the most anterior and sometimes the most posterior shorter; 4–7 *ads*. Frontal lunule paler brown, yellowish grey dusted; facial cavity blackish brown, shiny. Gena brownish black, with exception of small triangular spot below eye pruinose; *g* small. Eye of normal size (Fig. 133), its diameter about 3.2 times the smallest genal width. Antennae blackish, 3rd segment paler. Arista about 3.8 times as long as antenna and very long ciliate.

Thorax blackish brown, brown dusted. Mesonotum more shining, pleurae and scutellum duller. 2 *dc*, the anterior very short, only slightly longer than *ac* microsetae, the posterior about as long as basal *sc*. 8 rows of *ac* hairs, the medial prescutellar *ac* pair somewhat enlarged. Pleurae with yellowish brown sutures between pleural sclerites. Scutellum roundly triangular. Legs blackish brown, femora almost black, trochanters, knees and tarsi pale brownish yellow. t_2 chaetotaxy (Fig. 169) similar to that of *T. sudetica*, a small *av* in lower half of t_2 present. Ratio $t_2 : mt_2 = 2.00–2.15$. Wing (Fig. 170) with pale brownish membrane, veins brown. *C* extending far beyond R_{4+5}. R_{4+5} sinuate, almost straight apically. Discal cell large, rather long, tapering distally, with posterior outer corner rounded, the anterior corner with minute process of M_{1+2} continued by colourless venal fold. Alula large and rounded. Wing measurements: length 1.55–1.94 mm, width 0.67–0.79 mm, *C*-index = 0.83–0.94, $t_a – t_p : t_p = 3.07–4.50$. Halteres with yellow stem and brown knob.

Abdomen blackish brown, terga very sparsely haired and despite some pruinosity shiny, sterna more densely haired and dusted. *T1+2* normally pigmented and sclerotized. *S5* (Fig. 176) simple, with a dense row of bristles arising on paler pigmented transverse stripe in front of posterior margin. *S6* and particularly *S7* large (long) and therefore apex of male abdomen swollen though the periandrium is relatively short.

Genitalia. Periandrium (Figs. 173, 174) high but relatively short, with a long dorsolateral bristle, otherwise shortly haired. Cerci large, well differentiated, each with one longer and 2 short bristles. Hypandrium reduced. Telomere (Figs. 171, 172) large, more or less quadrate, with a number of robust bristles and spines on anterior and posterior margins and on inner side; outer side finely pubescent. The most characteristic is a comb of spines on inner side of telomere. Aedeagal complex (Fig. 175) relatively simple, phallophore short, frame-like, distiphallus consisting of two parts, the larger proximal with a ventral posterior projection, the smaller distal simply dilated apically. Postgonite with an internal, anteriorly projecting process which is, besides some setulae, finely pubescent. Ejaculatory apodeme not found.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.59 to 2.22 mm. t_2 chaetotaxy (Figs. 167, 168) corresponding with that of male but bristles (especially as regards *av* below middle of t_2) somewhat longer. Ratio $t_2 : mt_2 = 1.85–1.94$. Wing measurements: length 1.67–2.30 mm, width 0.69–1.05 mm, *C*-index = 0.82 – 0.94, $t_a – t_p : t_p = 3.85–4.73$.

Postabdomen (Figs. 164, 165) long, formed by relatively long, telescopically retractile segments. *T6* and *T7* widened posteriorly, *T8* with tripartite pigmentation, *T9* long, very narrow, with a pair of dorsal bristles. *S8* transversely oval, relatively large, with 4 long ventral bristles. *S9* large, much wider than *T9*, with some hairs and wholly different from that of *T. sudetica*. Spermathecae (Fig. 166) cylindrical, distinctly different from those of *T. sudetica*, with somewhat dilated ducts subterminally. Cerci long and more slender than in *T. sudetica*, with 3 long sinuate hairs (apical, dorso- and ventropreapical), 1 shorter sinuate lateral hair and 1 small curved hair.

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Discussion: *T. schmitzi* (DUDA) is very closely related to *T. sudetica* (ROHÁČEK) but differs from it in having wings always longer than the body length (in dry specimens), larger alula, simple *T1+2* and male *S5* without prominent structures, simple (not bilobed) telomere, differently formed distiphallus, postgonite, female *S9*, spermathecae etc. On the contrary, there are many features demonstrating the affinity of these species, e.g. t_2, head and thoracic chaetotaxy, telomere with internal comb of spines, finely haired inner side of postgonite, narrow female *T9*.

Limosina curtiventris STENHAMMAR, 1854, might be a related species though probably not conspecific with *T. schmitzi* (cf. DUDA, 1918, 1938). Unfortunately, the description of *L. curtiventris* (see STENHAMMAR, 1854: 365) is inadequate for correct recognition of the species (it might also be *Apteromyia claviventris*, *Terrilimosina racovitzai* etc.) and the type material was not found (KIM, 1972). Therefore, it seems to be most reasonable to consider it a species dubia.

Biology: A common species in woodlands (DUDA, 1918, 1938), especially in damp forests. It seems to be associated with higher altitudes (up to 1950 m in Alps — TROGER & ROHÁČEK, 1980) and was found to be eudominant species in wooded submountaine to mountaine valleys near streams, in swamps etc. (ROHÁČEK, 1980). Adults were collected in numbers by soil trap method (ROHÁČEK, 1980), on decayed leaves and other vegetation and in small mammal burrows (RICHARDS, 1930; HACKMAN, 1963a, b), only accidentally on excrement in woods. I have often sifted it from leaf litter, decayed moss and grass etc. It is interesting that RICHARDS (1930) recorded it only from rabbit and mouse runs (in small numbers). According to my experiences it is not a typical microcavernicolous species; also HACKMAN (1963b) classified it as merely tychocoenic in small mammal burrows. Thus, the species is terricolous (s. lat.) and very probably phytosaprophagous. Occurrence of the adults is throughout all the vegetation period (III—XII).

Distribution: Probably Holarctic species. Besides a number of records from Europe (GB: England, Wales — RICHARDS, 1930, 1976; GDR — DUDA, 1918; Poland — DUDA, 1918, 1938; Czechoslovakia — PAPP, 1973c, ROHÁČEK, 1978b, 1980; Austria — DUDA, 1918, TROGER & ROHÁČEK, 1980; Roumania — DUDA, 1918; Denmark — material examined, new; Finland — HACKMAN, 1963a, b, PAPP, 1973b) it is known also from Mongolia (PAPP, 1973a) and North America (SPULER, 1925b; RICHARDS, 1965).

6. Genus *Minilimosina* gen. nov.

Group of *L. fungicola* HALIDAY: RICHARDS, 1930: 293 (part.)
Type species: *Limosina fungicola* HALIDAY, 1836

Diagnosis: The genus is characterized by the following features.
(1) *pvt* distinctly developed, reduced or absent
(2) 2—5 small *if* of about equal length
(3) 2—6 minute *ads* inside and below *ors*
(4) *g* short or of medium length
(5) 2 *hu*, the internal small
(6) 1—2 short *dc*
(7) 4—8 rows of *ac* microsetae in front of suture
(8) 2 *stpl*, the anterior small
(9) mesopleuron and sternopleuron pollinose but often with shining spots
(10) scutellum rounded triangular or trapezoid, relatively short
(11) t_2 chaetotaxy (see Figs. 246—248), *av* below middle of t_2 always absent
(12) *C* extending far beyond R_{4+5}
(13) Cs_2 more or less shorter than Cs_3
(14) R_{4+5} slightly bent up to *C* or very slightly sinuate
(15) discal cell of medium length to very short, its posterior outer corner only rarely rounded
(16) alula small, narrow, acute

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(17) female postabdomen long, narrow, telescopically retractile into preabdomen (Fig. 186)
(18) male *S5* with peculiar structures on posterior margin (combs, processes)
(19) periandrium uniformly shortly haired
(20) male cerci each with 1 or more longer hair-like setae
(21) hypandrium long in most primitive groups (*Svarciella*) to reduced in the most advanced group (*Allolimosina*)
(22) telomere of various shapes
(23) phallophore not reduced, compact, rarely bipartite, always without epiphallus or pre-epiphallus
(24) distiphallus simply shaped and sclerotized
(25) postgonite usually slender and fairly long, with some minute setulae
(26) ejaculatory apodeme developed or absent
(27) female *T7* and *T6* often dorsally medially shortened or weakly sclerotized
(28) female *T8* long, with tripartite pigmentation
(29) female *T9* long, narrow, with 2 dorsal setulae
(30) female *S8* little reduced in primitive group (*Svarciella*) to strongly reduced or absent in progressive groups (*Minilimosina* s. str., *Allolimosina*)
(31) female *S9* large and broad
(32) spermathecae vesiculate, cylindrical to oval. An internal sclerite (homologous with the spectacles-shaped sclerite in more progressive genera) developed in some species
(33) female cerci long, with long sinuate hairs.

Discussion: The genus *Minilimosina* gen. nov. forms with *Xenolimosina* gen. nov. and *Terrilimosina* gen. nov. a group of genera probably of monophyletic origin. The shared features are discussed under the genus *Terrilimosina* and in the chapter "Phylogeny" (Part I). *Minilimosina* gen. nov. occupies a rather intermediate position between *Terrilimosina* and *Xenolimosina* and differs from them mainly by the small-size of the species, t_2 chaetotaxy (absence of *av* below middle of t_2), small alula combined with low *C*-index, uniformly shortly haired periandrium, compact phallophore without pre-epiphallus, simple distiphallus, presence of internal sclerite in female postabdomen (at least in some species) etc.

The genus is divided into 3 subgenera, *Svarciella* subgen. nov., *Minilimosina* s. str. and *Allolimosina* subgen. nov. The subgenus *Svarciella* with accumulated plesiomorphic features is thought to be the most primitive and *Allolimosina*, having a number of specialized structures, the most progressive group (see the chapter "Phylogeny"). *Minilimosina* gen. nov. includes 22 Palaearctic species, 13 of which occur in Europe. Four Nearctic species also belong to this genus. They are fully enumerated under the respective subgenera.

Key to European subgenera and species

1 2 *dc*, only 4—6 rows of *ac* microsetae between anterior *dc*. *T1+2* longer than *T3* and *T4* together. Preabdominal terga scarcely but long pale haired. Telomere longer than wide, usually lobe-shaped, rarely bilobed. Female *S8* large, broad (*Svarciella* subgen. nov.) 2

— 1 *dc* in prescutellar position, 6 or more rows of *ac* hairs in front of suture. *T1+2* shorter or at most as long as *T3* and *T4* together. Preabdominal terga sparsely and very shortly haired. Telomere flat, shorter than wide, with internal processes and keels. Female *S8* reduced to a narrow sclerite or wholly absent . . . 6

2(1) 4 rows of *ac* microsetae. Frons, ocellar triangle, frontal lunule, face, facial cavity and gena silvery white to silvery blue dusted, only the shortly cordate frontal triangle shining blackish brown. Sternopleuron with shiny spot as in Fig. 179. Preabdominal terga weakly sclerotized and pale brown pigmented. Male genitalia (Figs. 181—184), male *S5* (Fig. 185), female postabdomen and spermathecae (Figs. 187—190) . . . . . *M.* (*S.*) *vitripennis* (ZETTERSTEDT)

— 6 (very rarely 4) *ac* microsetae. Head differently pollinose, facial cavity, face and gena always without silvery grey or white pruinosity; frontal triangle long and narrow. Pleurae with different pollinose pattern. Preabdominal terga heavily sclerotized and black 3

DOI: 10.21248/contrib.entomol.33.1.3-195

3(2) *Cs2* yellowish brown as is *Cs3*. Pleurae with large shining spots on mesopleuron and sternopleuron (Fig. 191). Male *S5* with bifurcate process on posterior margin and small row of cuticular tubercles in front of it (Fig. 200). Male genitalia (Figs. 196—199), female postabdomen and spermathecae (Figs. 201—204) . . . . . *M.* (*S.*) *splendens* (DUDA)

— *Cs2* blackish and sharply contrasting with pale yellowish brown *Cs3*. Pleurae more pollinose, shining spots smaller. Male *S5* with a comb of blunt spines on posterior margin 4

4(3) Male *t2* ventrally without double row of short black spines, also *f2* simply haired. Pleurae completely pruinose. Male genitalia (Figs. 206, 207) with extremely large lobe-shaped telomere; male *S5* with convex bulge in front of medial posterior comb (Fig. 208); phallophore simple (Fig. 209). Female unknown . . . . . *M.* (*S.*) *hackmani* (ROHÁČEK)

— Male *t2* ventrally with double row of short spines, similarly *f2* ventrally with basal double row of bristles (Fig. 213). Pleurae with small shining spots. Male genitalia with small, bilobed telomere bearing 3 enormously robust spines. Male *S5* without convex bulge but in front of posterior medial comb with a crown of thick bristles. Phallophore bipartite (Fig. 215) 5

5(4) Antennae (at least 2 basal segments) and anterior part of frons brown to black. *pd* on *t2* situated more distally (Fig. 211). Mesopleuron and sternopleuron with very small shining spots (Fig. 224). Male *S5* laterally without enlarged bristles (Fig. 219). Aedeagal complex (Fig. 215) with shorter distiphallus and postgonite. Telomere (Fig. 216) with larger external lobe and 3 differently situated robust spines. Female postabdomen and spermathecae (Figs. 220—223) . . . . . *M.* (*S.*) *v-atrum* (VILLENEUVE)

— Antennae and anterior margin of frons pale yellowish brown. *pd* on *t2* situated more proximally (Fig. 225). Mesopleuron and sternopleuron with larger shining spots (Fig. 228). Male *S5* (Fig. 234) with enlarged and thickened lateral bristles. Aedeagal complex (Fig. 230) with longer distiphallus and postgonite. Telomere with smaller external lobe and 3 differently arranged robust spines (Fig. 231). Female unknown . . . . . ***M. (S.) ismayi* spec. nov.**

6(1) Discal cell longer, with anterior outer corner acute-angled to rectangular, or rarely slightly obtuse-angled; posterior outer corner never acute-angled. *C*-index usually over 0.70. Male *f2* ventrally with a short row of basal bristles (see Figs. 246, 271). Hypandrium of medium length, telomere with posterior robust blunt spine. Aedeagal complex with shorter, compact phallophore. Female *S8* reduced to a long, narrow sclerite (sometimes divided into more small sclerites). (*Minilimosina* s. str.) 7

— Discal cell very short, with anterior outer corner obtuse-angled and posterior outer corner acute-angled. *C*-index always less than 0.70. Male *f2* simple. Hypandrium very short, reduced. Telomere without posterior robust spine. Phallophore longer and more slender. Female *S8* reduced to a minute, short sclerite or wholly absent (*Allolimosina* subgen. nov.) 11

7(6) Mesopleuron and sternopleuron with shining spot (Fig. 235). *C*-index very low (about 0.70); veins, except. for *C*, very pale yellowish white. *S5* of the male (Fig. 245) with peculiar fivefold comb of spines on posterior margin. Male cercus with 2 very long hair-like bristles (Fig. 240). Telomere as in Fig. 242, aedeagal complex (Fig. 243) with robust distiphallus and postgonite. Female unknown . . . . . ***M. (M.) tenera* spec. nov.**

— At most merely sternopleuron with shining spot (Fig. 238). *C*-index usually higher, veins darker yellowish brown to brown. Male *S5* differently armed. Male cercus with much shorter setae. Aedeagal complex with more slender distiphallus and postgonite 8

8(7) Apical *sc* shorter or as long as the scutellum. Sternopleuron with shining spot (Fig. 238). *t2* in apical fourth with *ad* larger than the adjacent *pd*. Postgonite more straight. Female *T6* and *T7* medially not weakly sclerotized 9

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— Apical *sc* considerably longer than the scutellum. Sternopleuron without shining spot. t_2 in apical third with *ad* smaller than the adjacent *pd*. Postgonite more s-shaped. Female *T6* and *T7* medially membraneous, pale pigmented 10

9(8) *C*-index higher (0.79—1.03) on the average. Male *S5* with small medial comb of spines on posterior margin, partly hidden in hairs (Fig. 254). Telomere (Fig. 251) ventrally without robust, short and blunt spine but with 4 thicker curved bristles. Aedeagal complex (Fig. 250), female postabdomen and spermathecae (Figs. 255—258) . . . . . *M.* (*M.*) *fungicola* (HALIDAY)

— *C*-index usually lower (0.71—0.89). Male *S5* (Fig. 260) with a robust medial posterior projection partly covered with a lobe being overgrown by dense rows of setulae. Telomere (Fig. 261) ventrally with a robust, short and blunt spine. Aedeagal complex as in Fig. 262. Female unknown . ***M. (M.) gemella* spec. nov.**

10(8) Male *S5* with fourfold comb of spines on medial posterior lobe and with a robust, long posterior projection protruding behind this lobe (Fig. 263). Telomere (Fig. 264) with short, external lobe anteriorly projecting ventrally, and longer, large internal lobe. Female *S8* less reduced (Fig. 269) and cerci with fine dorsopreapical sinuate hair (Fig. 268), spermathecae with longer sclerotized parts of ducts (Fig. 270) . . . . . ***M. (M.) trogeri* spec. nov.**

— Male *S5* with medial comb of blunt spines on posterior, darkly pigmented lamella (Fig. 279). Telomere (Fig. 276) with large external lobe being ventrally densely haired, internal lobe smaller. Female *S8* reduced to a very narrow T-shaped sclerite with 2 small anterior additional sclerites (Fig. 282) and cerci with thickened dorsopreapical sinuate hair (Fig. 281), spermathecae with shorter sclerotized parts of ducts (Figs. 283, 284) . . . . *M.* (*M.*) *parvula* (STENHAMMAR)

11(6) R_{2+3} apically strongly curved up to *C* (Fig. 313). Mesopleuron and sternopleuron with shining spots as in Fig. 311. Male unknown. Female postabdomen with relatively narrow *S9* with narrow and deep anterior incision (Fig. 316) . . . . . *M.* (*A.*) *secundaria* (DUDA)

— R_{2+3} apically almost straight (Figs. 290, 300). Mesopleuron and sternopleuron differently pruinose. Female postabdomen with much wider *S9* being also more broadly anteriorly incised 12

12(11) Discal cell very short, t_a—t_p shorter than t_p (Fig. 300); wing with pale brownish veins, *C* dark brown. Mesopleuron and sternopleuron with larger shining pattern (Fig. 312). Telomere (Fig. 302), distiphallus longer (Fig. 301), male cerci different (Fig. 304). Female postabdomen (Figs. 306—308) without *S8* and with larger and more narrowly incised *S9*. Spermathecae (Fig. 309) with longer sclerotized parts of ducts . . . . . *M.* (*A.*) *alloneura* (RICHARDS)

— Discal cell longer, t_a—t_p longer than t_p (Fig. 290); wing with whitish membrane and veins, *C* pale yellowish brown. Mesopleuron and sternopleuron with smaller shining spots (Fig. 289). Telomere (Fig. 292), distiphallus shorter (Fig. 291), male cerci as in Fig. 294. Female postabdomen (Figs. 296—298) with small relic of *S8* and smaller and more broadly incised *S9*. Spermathecae (Fig. 299) with shorter sclerotized parts of ducts . . . . . *M.* (*A.*) *albinervis* (DUDA)

Subgenus ***Svarciella* subgen. nov.**

Type species: *Limosina* (*Scotophilella*) *splendens* DUDA, 1928

Diagnosis: The subgenus is characterized as follows.

(1) *pvt* absent (instead a pair of small divergent postocellar hairs often developed)
(2) 2—4 small *if*
(3) 2—6 minute *ads* inside and below *ors*
(4) *g* short or of medium length
(5) 2 *hu*, the internal very minute
(6) 2 *dc*, the anterior short
(7) 4—6 rows of *ac* microsetae between anterior *dc*

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(8) 2 *stpl*, the anterior minute
(9) mesopleuron and sternopleuron usually with shining spots
(10) scutellum shortly triangular or trapezoid
(11) t_2 chaetotaxy (Figs. 192—194), ventrally with only *va* (in male sometimes with double row of short spines — *M. v-atrum*, *M. ismayi* spec. nov.)
(12) *C* distinctly overpassing R_{4+5}
(13) Cs_2 regularly shorter than Cs_3 (*C*-index less than 0.90)
(14) R_{4+5} very slightly bent up to *C* or indistinctly sinuate
(15) discal cell of medium length, with anterior outer corner acute or rectangular, posterior outer corner obtuse-angled but never rounded
(16) alula small, narrow, acute
(17) *T1+2* very long, longer than *T3* and *T4* together
(18) female postabdomen long, narrow, telescopically retractile
(19) male *S5* with peculiar medial structure on posterior margin (comb, process etc.)
(20) periandrium uniformly haired; each of the cerci with some longer hairs
(21) hypandrium slender, relatively long, rod-like
(22) telomere large, lobe-shaped, with internal projections and keels, rarely bilobed (*M. v-atrum* group)
(23) phallophore comparatively short but not reduced, compact or bipartite (*M. v-atrum* group), pre-epiphallus not developed
(24) distiphallus simply shaped and sclerotized; in *M. vitripennis* with dorsal flagellum
(25) postgonite slender, long, with some minute hairs on anterior margin
(26) small ejaculatory apodeme developed or absent
(27) female *T8* long, with tripartite pigmentation
(28) female *T9* long, narrow, with 2 dorsal setulae
(29) female *S8* large, not reduced
(30) female *S9* large, broad, as typical of the whole genus
(31) spermathecae more or less cylindrical or vesiculate with bulged tips
(32) female cerci long, slender, each with 3 longer sinuate and some shorter curved hairs.

Discussion: The subgenus is a distinct and apparently monophyletic group of the genus *Minilimosina*. It differs from the related subgenera *Minilimosina* s. str. and *Allolimosina* subgen. nov. by absence of *pvt*, presence of 2 *dc*, only 4—6 rows of *ac* hairs, low *C*-index combined with acute-angled anterior outer corner of discal cell, very long *T1+2*, long haired preabdominal terga, comparatively simple and long telomere and large female *S8*.

The position of the subgenus *Svarciella* in the genus *Minilimosina* is clearly confirmed by number of shared features (formation of aedeagal complex, periandrium, female *T8*, *T9*, *S9* and female cerci as well as t_2 chaetotaxy and wing venation) and it seems to represent the most primitive group of this genus in retaining 2 *dc*, long hypandrium, relatively simple telomere (at least in some species) and most important the non-reduced female *S8*.

The subgenus includes 8 species in the Palaearctic Region, 5 of which occur in Europe, *M. vitripennis* (ZETTERSTEDT, 1847), *M. splendens* (DUDA, 1928), *M. hackmani* (ROHÁČEK, 1977), *M. v-atrum* (VILLENEUVE, 1917) and *M. ismayi* spec. nov., *M. furculisterna* (DEEMING, 1969) comb. nov. was described from Nepal, *M. unica* (PAPP, 1973) comb. nov. and *M. paravitripennis* (PAPP, 1973) comb. nov. from Mongolia. As regards Nearctic species, *M. albifrons* (SPULER, 1925) comb. nov. without doubt belongs to *Svarciella* subgen. nov., and possibly also *M. mollis* (RICHARDS, 1963) comb. nov., *M. nigrifrons* (SPULER, 1925) comb. nov. and *M. nasuta* (SPULER, 1925) comb. nov. The latter species is more probably relegable to *Minilimosina* s. str.

Remarks: The subgenus is named in honour of Mr. JAROMÍR ŠVARC (Třeště, Czechoslovakia) my first teacher of biology and a good botanist who promoted my early interest in entomology.

Minilimosina (Svarciella) vitripennis (ZETTERSTEDT, 1847), comb. nov.

(Figs. 177—190)

Limosina vitripennis ZETTERSTEDT, 1847: 2505, 1860: 6416; STENHAMMAR, 1854: 418; COLLIN, 1956: 174; PAPP, 1973c: 42 (key)
Limosina (Scotophilella) vitripennis: DUDA, 1918: 118

DOI: 10.21248/contrib.entomol.33.1.3-195

Leptocera (Scotophilella) vitripennis: DUDA, 1925: 155, 157 (key)
Leptocera (Limosina) vitripennis: RICHARDS, 1930: 293
Leptocera vitripennis: SÉGUY, 1934: 471; NARTSHUK, 1970: 346 (key)
Limosina fungicola: RONDANI, 1880: 23 nec HALIDAY, 1836
Limosina (Limosina) fungicola: DUDA, 1938: 124

Type material: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "*L. vitripennis* ♂♀ Esp. un." and bearing a small greenish blue rectangle pinned below specimen. Abdomen detached and preserved in a plastic tube with glycerine, pinned on the same pin; paralectotype ♀ unlabelled (it shares the label with the lectotype) but with the same small greenish blue rectangle (ZIL).

Material examined (besides „Type material"): 13 ♂ 24 ♀

Spain: 2 ♀ (JRO) — Grazalema nr. Ronda (ROHÁČEK leg.).

Austria: 7 ♂ 5 ♀ (NMA, IZI, JRO) — Tyrol: Obergurgl Mt. (TROGER, STOCKNER leg.), Hohe Tauern-Badgastein (TECCER leg.); Steiermark: Bösenstein, Steierische Alpen Mts. (STROBL leg.).

Czechoslovakia: 2 ♂ 3 ♀ (NMP, JZP, JRO, SMO) — Bohemia: Cheb (KOWARZ leg.), Milá nr. Most (JEŽEK leg.), Krušné hory Mts.-Místo (MOCEK leg.); Moravia: Hrubý Jeseník Mts.-Skřítek (ROHÁČEK leg.); Slovakia: Slovenský Raj-Kysel (ŠKALOUDOVÁ leg.).

Bulgaria: 2 ♂ 6 ♀ (IZS) — Vihren, Vitoscha-Karkuma, Vitoscha -Kupena, Petritschko, Trojan, Pirin Mts.-Bansko, Korandlia (BESHOVSKI leg.).

Denmark: 1 ♂ 8 ♀ (ZMK) — SJ: Sønderborg, Madskov (WÜSTNEI leg.), Fanø (MORTENSEN leg.); EJ: Grejsdalen (MARTIN leg.); F: Veflinge (HANSEN leg.), Knagebjerg Skov, Arreskov Sø (KIRSTENSEN leg.); NEZ: Utterslev Mose (SCHLICK leg.), Bagsvaerd (LYNEBORG leg.).

Sweden: 1 ♂ (ZIL) — Ly. Lpm.: Tärna (ZETTERSTEDT leg.).

Description:

Male. Total body length 1.19—1.50 mm, general colour brownish black (except for the preabdomen), rather shining. Head dark brown, a narrow anterior margin of frons pale brown. Entire head, except for the wide, short and shiny frontal triangle dusted. Occiput greyish brown dusted, frons including the ocellar triangle silvery grey to blue dusted, frontal lunule, face, facial cavity and gena silvery grey to white pollinose. *pvt* absent, 2—3 weak *if*, 3rd pair very small or absent. 4—6 small *ads*. Face with some (4—5) minute hairs. Gena besides moderate *g* with 2 additional bristles. Eye of normal size, its largest diameter about 3.5 times the narrowest genal width. Antennae brownish black, 3rd segment a little longer pilose than arista. Arista about 3.2 times as long as antenna, rather shortly ciliate.

Thorax dark brown to blackish brown. Mesonotum despite brown pollination shining, pleurae duller. 2 *dc*, the anterior (postsutural) somewhat longer than *dc* microsetae; *ac* hairs in only 4 rows between anterior *dc*. Scutellum roundly triangular. Sternopleuron with shining spot (Fig. 179). 2 *stpl*, the anterior minute, hair-like. Legs brownish black, trochanters, knees and tarsi paler brown. t_2 chaetotaxy as in Figs. 177, 178, ventrally with only *va*. Ratio t_2: mt_2 = 1.78—2.07. Wing (Fig. 180) with very pale membrane, veins yellowish brown, except for Cs_2 being strikingly dark, blackish. *C* extending far beyond R_{4+5}. R_{4+5} very slightly bent. Discal cell of medium length, its anterior outer corner acute-angled or rectangular, posterior corner obtuse-angled, both carrying distinct, pigmented processes of M_{1+2} and M_{3+4}. Alula small, narrow. Wing measurements: length 1.31—1.50 mm, width 0.56—0.64 mm, *C*-index = 0.74—0.84, t_a—t_p: t_p = 2.33—3.00. Halteres pale brownish, knob darker, brown.

Abdomen with large *T1+2* being similarly as *T3—T5* simply but pale brown pigmented and distinctly weakly sclerotized contrary to dark pigmented and heavily sclerotized postabdomen. *S5* (Fig. 185) medially on posterior margin with a flat, posteriorly incised appendage being bent to ventral surface of abdomen in natural position and carrying some small setulae.

Genitalia. Periandrium (Figs. 183, 184) uniformly and sparsely haired, only hairs round the anal fissure somewhat longer. Cerci reduced and fused with periandrium, each bearing a stronger bristle. Subanal plate between cerci reduced to a narrow, stripe-shaped sclerite (intraperiandrial sclerite not figured in Fig. 184). Hypandrium slender, long, rod-like. Telomere (Fig. 182) large, with posterointeriorly curved apex. Inner side of telomere with a process carrying stout and blunt spine. Aedeagal complex (Fig. 181) large. Phallophore short, compact, simply shaped. Distiphallus composed of a ventral forked sclerite and very slender dorsal flagellum (often longer than in the figure), otherwise membraneous. Apical part of membrane of distiphallus finely spinulate. Postgonite long, slender, tapering distally, with some minute setulae. Ejaculatory apodeme probably absent.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.42 to 1.79 mm. t_2 chaetotaxy as in the male (Figs. 177, 178). Ratio t_2: mt_2 = 1.80—1.92. Wing measurements: length 1.42 to 1.91 mm, width 0.60—0.83 mm, *C*-index = 0.71—0.87, t_a—t_p: t_p = 2.00—2.60. Abdomen with weakly sclerotized and pale pigmented *T1+2—T5* (Fig. 186). *S1+2—S5* small, narrow.

Postabdomen (Figs. 188—190) very narrow, long, telescopic, in dry specimens retracted. Postabdominal sclerites dark pigmented and heavily sclerotized in contrast to preabdominal ones. *T6—T7* haired only on posterior margins. *T8* long, with tripartite pigmentation. *T9* long, narrow, with a pair of dorsal bristles. *S8* unusually large, posteromedially with a shallow impression. *S9* large, much wider than *T9* and carrying some longer hairs posterior margin. Spermathecae (Fig. 187) with protruding tips and bases of spermathecal ducts. Sclerotized parts of ducts relatively long. Cerci long, slender, each with a long apical, somewhat shorter dorso- and lateropreapical and short lateral and ventropreapical more or less sinuate hairs.

Discussion: *M. vitripennis* (ZETTERSTEDT) is an aberrant member of the subgenus *Svarciella* distinguished by its particularly pollinose head with short, cordate frontal triangle, only 4 rows of *ac* hairs and weakly sclerotized preabdomen. The genitalia are also characteristic (distiphallus with long dorsal flagellum, reduced subanal plate, distinctive telomere) as well as the female postabdomen (very slender segments, large *S8*, pilosity of cerci). However, the existence of intermediate species, as is for example the North American *Minilimosina albifrons* (SPULER, 1925) or *M. furculisterna* (DEEMING, 1969) from Nepal, general similarities in the structure of the male and female terminalia, t_2 chaetotaxy and wing venation confirm the placement of *M. vitripennis* to the subgenus *Svarciella*.

Minilimosina furculisterna (DEEMING) seems to be its closest Palaearctic relative, though its external genitalia resembles more that of *M. splendens* (DUDA) or *M. hackmani* (ROHÁČEK); a further related species is thought to be *M. paravitripennis* (PAPP, 1973) from Mongolia differing by its entirely dark brown *C*, yellow gena and anterior part of frons and

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pale halteres. Unfortunately, the internal male genitalia or female terminalia of these species are unknown so that it is difficult to discuss their relationships more precisely.

Biology: The species occurs in woodland meadows or in woods, usually in wet places under decaying vegetation (RICHARDS, 1930; DUDA, 1938; HACKMAN, 1969c). It was often found in runs and nests of small mammals (e.g. RICHARDS, 1930; HACKMAN, 1967a). The feeding substrate of larvae remains unknown but the species is probably phytosaprophagous, although it was also found very rarely on manure (RICHARDS, 1930; DUDA, 1938; PAPP, 1975a, 1976b). Adults were collected during the whole year (combined data of some authors and material examined), according to RICHARDS (1930) the peak occurrence may be in spring or towards the end of winter. The species is rather frequent in North Europe (and probably Palaearctic); in Central and South Europe it seems to be associated with mountains and is very rare in lowlands (cf. PAPP, 1973c, 1976a).

Distribution: Palaearctic species known besides Europe from Afghanistan (HACKMAN, 1969c; PAPP, 1976b, 1978a) and Mongolia (PAPP, 1973a, 1974d). The European records are from Spain (DUDA, 1918), France (SÉGUY, 1934), GB: England, Wales, Scotland (RICHARDS, 1930, 1976), Belgium (VANSCHUYTBROECK, 1943a), FRG, GDR, Poland (DUDA, 1918), Czechoslovakia (KOWARZ, 1894; BRANCSIK, 1910; VIMMER, 1913; ROHÁČEK, 1978b), Hungary (PAPP, 1973c, 1975a, 1976a), Austria (DUDA, 1918; TROGER & ROHÁČEK, 1980), Italy (RONDANI, 1880; DUDA, 1918), Jugoslavia (DUDA, 1918; COE, 1962a), Bulgaria (material examined, new), Denmark (material examined, new), Sweden (ZETTERSTEDT, 1847, 1852, 1855, 1860; STENHAMMAR, 1854; HACKMAN, 1967a), Finland (FREY, 1941), Faeroe Is. (LYNEBORG, 1968), Iceland (ANDERSSON, 1967).

Minilimosina (Svarciella) splendens (DUDA, 1928), **comb. nov.**

(Figs. 191–204)

Limosina (*Scotophilella*) *splendens* DUDA, 1928: 167
Limosina (*Limosina*) *splendens*: DUDA, 1938: 149
Limosina splendens: PAPP, 1973c: 53 (key); ROHÁČEK, 1977b: 118
Limosina nitens: COLLIN, 1956: 173 nec STENHAMMAR, 1854

Type material: Lectotype ♀ (des. by ROHÁČEK in 1979) labelled: "19 5 21", "Wustung b. Habelschwerdt, 1. DUDA" and "*S. splendens* n. sp. ♀ d. DUDA". Paralectotype ♀ labelled: "4 9 17", "Herten Westf. DUDA", "*Scotophilella splendens* ♀ d. DUDA" and "Flügel phot." (ZMB).

Material examined (besides "Type material"): 15 ♂ 8 ♀

GB: 1 ♂ (UMO) – England: Cambs: Chippenham Fen (COLLIN leg.).

Czechoslovakia: 12 ♂ 8 ♀ (JRO, SMO, JZP, MHK) – Bohemia: Kladno env. (ZUSKA leg.), Choltice (MOCEK leg.); Moravia: H. Jeseník-Mts.-Rejvíz, Úvalenské louky (distr. Opava) (ROHÁČEK leg.) and localities given by ROHÁČEK (1977a, 1980); Slovakia: Vihorlat Mts.-R. Hámre (ROHÁČEK leg.).

Poland: 1 ♂ (ZMB) – Rauden nr. Glivice (DUDA leg.).

USSR: 1 ♂ (ZMH) – Ib: S:t Andrae (FREY leg.).

Description:

Male. Total body length 1.15–1.37 mm, general colour black, shining, only scarcely pollinose. Head black; orbits, very narrow interfrontalia and ocellar triangle silvery pollinose; frontal triangle long, black, shining (mainly medially); stripes between orbits and interfrontalia blackish dusted, dull. True *pvt* absent. 3 small *if*, the medial usually a little longer. 2–4 small *ads*. Frontal lunule black or brown, densely grey dusted. Facial cavity, face and a spot below eye shining black. Rest of gena and lower margin of facial cavity greyish pollinose. *g* small. Eye diameter about 3.4 times the smallest genal width. Antennae brown, 3rd segment paler, shortly ciliate. Arista about 4 times as long as antenna, rather shortly ciliate.

Thorax black, shining. Mesonotum and scutellum brown pollinose but shining. Mesopleuron and sternopleuron (Fig. 191) with characteristic shiny spots, the rest and pteropleuron brownish grey pollinose. Mesonotal chaetotaxy: 2 short *dc*, 6 rows of *ac* microsetae. Scutellum short, rounded trapezoid, with short *sc*. 2 *stpl* as usual. Legs black, trochanters, knees and tarsi yellowish brown. t_2 chaetotaxy as in Fig. 194, ventrally with a short *va*. Ratio $t_2 : mt_2 = 1.73–1.83$. Wing (Fig. 195) very pale brownish, veins yellowish brown. *C* extended beyond R_{4+5}. R_{4+5} basally straight or slightly convex, apically very slightly bent to *C*. Discal cell rather broad, with more or less developed pigmented appendages of M_{1+2} and M_{3+4} beyond t_p; anterior outer corner acutely angled. Alula small, narrow, pointed. Wing measurements: length 1.15–1.37 mm, width 0.52–0.55 mm, *C*-index = 0.68–0.86, $t_a – t_p : t_p = 2.29–2.44$. Halteres with yellow stem and large black knob.

Abdomen black, brownish grey pollinose, subshining. *T1+2* long, longer than *T3* and *T4* together, simply pigmented. Terga sparsely but long haired on lateral and posterior margins. Sterna somewhat more densely haired. *S5* (Fig. 200) with a row of equally thick and long spines in the middle of posterior margin. A structure behind these spines (consisting of basal regular row of cuticular tubercles and an apical, dark, bifurcate process) is in the natural position bent at right angles to the ventral side of the abdomen.

Genitalia. Periandrium (Figs. 198, 199) smaller than in *M. hackmani*, shortly uniformly haired. Cerci fused with periandrium and bearing some longer hairs. Hypandrium relatively long, slender. Telomere (Fig. 197) large, shining, lobe-shaped, with uniformly bristled outer side. The inner side projecting in 2 flat processes (anterior and posterior) each carrying a robust spine and some smaller bristles. Aedeagal complex (Fig. 196) with simple distiphallus (almost identical with that of *M. hackmani*) and somewhat ventrally projecting phallophore. Postgonite slender, S-shaped, with rounded apex and 2 very small setulae on outer side. Ejaculatory apodeme not observed.

Female. Head, thorax, legs, wing and preabdomen as in the male, unless mentioned otherwise. Total body length 1.25 to 1.69 mm. t_2 chaetotaxy equal to that of male but *va* longer (Figs. 192, 193). Ratio $t_2 : mt_2 = 1.76–2.00$. Wing measurements: length 1.12–1.49 mm, width 0.52–0.67 mm, *C*-index = 0.64–0.84, $t_a – t_p : t_p$ ♀ = 2.15–2.50.

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Postabdomen (Figs. 202–204) narrow, retractile into preabdomen. *T6* and *T7* with a deep semicircular anterior incision. *T8* long, pigmented laterally and medially. *T9* long, narrow, with 2 dorsal setulae. *S8* much smaller than *S7*, with triangular pigmentation and 2 longer bristles. *S9* large, broad, twice wider than *T9*, finely pubescent and with some hairs on posterior margin. Spermathecae (Fig. 201) roughly cylindrical, with short sclerotized parts of ducts. Cerci long, slender, each with long, sinuate apical, dorsopreapical and ventropreapical hairs besides 2 short lateral hairs.

Discussion: The species is most closely related to *Minilimosina hackmani* (ROHÁČEK) having similarly shaped male genitalia (aedeagal complex, telomere) and almost identical t_2 chaetotaxy. However, there are distinct differences in the armature of telomere and male *S5*, in pollinose pattern on mesopleuron and sternopleuron etc. (see key). *M. furculisterna* (DEEMING, 1969) from Nepal has rather similar telomere (cf. DEEMING, 1969, Figs. 29, 30) but its weakly sclerotized preabdomen and only 4 rows of *ac* hairs indicate relationship with *M. vitripennis* (ZETTERSTEDT). Further related species, *M. v-atrum* (VILLENEUVE), *M. ismayi* spec. nov. and *M. unica* (PAPP) are much more different.

Limosina nitens of COLLIN (1956) (nec STENHAMMAR, 1854) was revised and found to be *M. splendens* (cf. ROHÁČEK, 1977b).

Biology: An uncommon species occurring in damp woods (DUDA, 1928, 1938); it was collected on decayed fungi (PAPP, 1973c), on roe excrement and by sweeping over undergrowth of wood (ROHÁČEK, 1977b). Some specimens have been caught by soil traps (ROHÁČEK, 1975a, 1980; PAPP, 1976a). The feeding substrate of the larvae remains still unknown. Adults were recorded from IV–X (according to material examined).

Distribution: Europe (probably Central European geoelement s. lat.) — GB:England (COLLIN, 1956; RICHARDS, 1976; ROHÁČEK, 1977b), FRG, Poland (DUDA, 1928, 1938), Czechoslovakia (ROHÁČEK, 1975a, 1977b, 1978b, 1980), Hungary (PAPP, 1973c, 1976a), USSR: Ib (material examined, new).

Minilimosina (Svarciella) hackmani (ROHÁČEK, 1977), comb. nov.

(Figs. 205–209)

Limosina hackmani ROHÁČEK, 1977b: 115

Type material: Holotype ♂: Finland, Ks: Kuusamo, without further data, R. FREY leg. (ZMH, Type No. 14280). Genitalia dissected and preserved in a microvial pinned below type specimen.

Description:

Male. Total body length 1.68 mm, general colour black, shining. Head black; orbits, ocellar triangle and occiput greyish pollinose; frontal triangle (except for the ocellar triangle) shining. Behind ocellar triangle a pair of minute divergent postocellar hairs, true *pvt* absent. 4 small *if*, all of equal length, 2–3 minute *ads*. Frontal lunule yellowish grey dusted, face brown, gena black, both sparsely grey dusted. Facial cavity black, shining. *g* weak, only as long as well developed peristomal hairs. Eye normal, its diameter more than 3 times the smallest genal width. Antennae black, with brown, yellowish pubescent 3rd segment. Arista 3.2 times as long as antenna, moderately long ciliate.

Thorax black, mesonotum despite some pollination shining, pleurae more densely pollinose, dull. 2 *dc*, the anterior only about twice as long as *dc* microsetae; *ac* hairs comparatively long, in 6 rows between anterior *dc*. Pleurae blackish brown, sutures between pleural sclerites paler. Mesopleuron and sternopleuron almost completely pruinose. Scutellum roundly, shortly triangular, with pruinose disc and shining hind margin. Legs blackish brown, trochanters, knees and tarsi yellowish brown. Chaetotaxy of t_2 as in *M. splendens* (cf. Figs. 192–194), the distal *pd* reduced, small; ventrally with only *va*. Ratio t_2: $mt_2 = 1.56$. Wing (Fig. 205) with light yellowish brown membrane, veins light brown, Cs_2 compared to Cs_3 strikingly darker, blackish brown; *C* overpassing R_{4+5}. R_{4+5} very slightly sinuate. Discal cell with anterior outer corner acute, posterior corner obtuse-angled. Both appendages of M_{1+2} and M_{3+4} beyond t_p developed but short. Alula small, acute. Wing measurements: length 1.58 mm, width 0.69 mm, *C*-index=0.82, $t_a - t_p$: $t_p = 2.67$. Halteres with orange stem sharply contrasting with black knob.

Abdomen black, shining. *T1+2* about 2.5 times as long as *T3* and longer than *T3* and *T4* together. *T3–T5* with long pale hairs on lateral and posterior margins. Sterna becoming wider posteriorly; then *S5* (Fig. 208) the widest and very characteristically shaped – the hind medial part (separated from both lateral parts by pale, narrow areas) protruding in convex bulge, densely overgrown by bristles. Posteromedial margin behind, this bulge with a regular comb of blunt spines.

Genitalia. Periandrium (Figs. 206, 207) large, moderately shortly haired, without any longer hair. Cerci fused with periandrium, each bearing some longer bristles. Hypandrium long, thin, rod-like. Telomere extremely large, lobe-shaped, similar to that of *M. splendens* but on inner side without internal projections with thick spikes but proximally with a small anterior projection and densely bristled in the middle of posterior margin. Aedeagal complex (Fig. 209) very similar to that of *M. splendens* but larger; postgonites somewhat thicker than in *M. splendens*, with 2 setulae on anterior margin. Phallophore rather different from that of *M. splendens* and ejaculatory apodeme present.

Female unknown.

Discussion: The species is most closely related to *M. splendens* (DUDA) having similar male genitalia (general shape of periandrium, telomere, almost equally formed aedeagal complex) and t_2 chaetotaxy, but differs from it in having fully pruinose pleurae, dark Cs_2, quite different male *S5* and some peculiarities on genitalia (inner side of telomere, phallophore). *M. v-atrum* (VILLENEUVE) and *M. ismayi* spec. nov. are also related species resembling *M. hackmani* in the external morphology (more pruinose pleurae, darkened C_{s2}, strikingly long haired terga) and might be easily mistaken for this species especially in

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the female sex. Males of *M. v-atrum* and *M. ismayi* spec. nov. are readily separable from *M. hackmani* by f_2 and t_2 chaetotaxy and genitalia. Unfortunately, the female of *M. hackmani* remains still unknown and therefore we cannot precise differences between it and that of *M. v-atrum*.

As mentioned by ROHÁČEK (1977b) *M. furculisterna* (DEEMING, 1969) from Nepal has similarly formed telomere but this species seems to be closer to *M. vitripennis* (ZETTERSTEDT) (see above). *M. unica* (PAPP, 1973) from Mongolia might be related to *M. v-atrum* or *M. hackmani* and probably actually belongs to the subgenus *Svarciella* but differs from these species by entire *C* dark brown.

Biology: Unknown.

Distribution: Finland (ROHÁČEK, 1977b).

Minilimosina (Svarciella) v-atrum (VILLENEUVE, 1917), **comb. nov.**
(Figs. 210–224)

Leptocera (*Limosina*) *v-atrum* VILLENEUVE, 1917: 142
Leptocera (*Scotophilella*) *v-atrum*: DUDA, 1925: 155 (key)
Limosina (*Limosina*) *v-atrum*: DUDA, 1938: 151
Leptocera v-atrum: NARTSHUK, 1970: 346 (key)
Limosina v-atrum: PAPP, 1973c: 42 (key); ROHÁČEK, 1977b: 119
Limosina (*Scotophilella*) *guestphalica* DUDA, 1918: 117
Leptocera (*Limosina*) *guestphalica*: RICHARDS, 1930: 293

Type material:
Leptocera (*Limosina*) *v-atrum* VILLENEUVE: Described by VILLENEUVE (1917) from 1 ♂ 1 ♀ originating from Berlin environment. Location of types unknown (not examined).
Limosina (*Scotophilella*) *guestphalica* DUDA: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "27 4 16", "Herten Westf. DUDA", "Westfalica ♂ det. DUDA", "*guestphalica*" and "phot" (ZMB). Paralectotype ♀ labelled: ,,27 4 16", "Herten Westf. DUDA" and "*guestphalica* ♀ d. DUDA" (ZMB).

Material examined (besides ,,Type material"): 10 ♂ 9 ♀

GB: 2 ♂ (BML) — Scotland: Inverness: Glen Einich (COE leg.); England: Ashperton Park (WOOD leg.).

Czechoslovakia: 6 ♂ 4 ♀ (JRO, SMO) — Moravia: Třešť, H. Jeseník Mts.-Skřítek, Rejvíz, Kouty n. D. (ROHÁČEK leg.); Slovakia: Kremnické pohorie Mts.-Turček env., Belanské Tatry Mts.-Šarpanec (ROHÁČEK leg.).

Denmark: 2 ♀ (ZMK) — SJ: Draved Skov (JENSEN leg.); B: Borrelyng (O. M. & B. V. P. leg.).

Finland: 2 ♂ 3 ♀ (ZMH) — N: Pusula (HELLÉN leg.) and localities given by ROHÁČEK (1977b).

Description:
Male. Total body length 1.20–1.50 mm, general colour black, slightly greyish brown dusted and shining. Head black, rather shiny. Frontal triangle long, blackish shining. Orbits and very narrow interfrontalia silvery dusted; anterior margin of frons more densely greyish dusted. Occiput and ocellar triangle greyish brown pruinose. *pvt* absent, instead of them a pair of divergent postocellar setulae developed. 3–4 small *if* (the anterior the smallest) and 2–4 minute *ads*. Frontal lunule grey pollinose, facial cavity and gena black, sparsely grey pollinose (with exception of small shining spot below eye), subshiny. *g* moderately long. Eye normal, its diameter 4 times the smallest genal width. Antennae blackish brown, 3rd segment often paler brown and fairly long pubescent. Arista about 3.9 times as long as antenna, relatively long ciliate.

Thorax black, mesonotum despite some pruinosity shining, pleurae more heavily dusted and duller. 2 *dc*, the anterior short; 6 rows of relatively long *ac* hairs, the medial prescutellar *ac* pair enlarged. Pleurae black, sutures between pleural sclerites brown. Mesopleuron with small shining spots (Fig. 224). Scutellum shortly triangular, *sc* somewhat short. Legs black, trochanters, knees and tarsi paler brown, all legs pale brown haired. f_2 ventrally with 2 rows (antero- and posteroventral) of stronger bristles; t_2 distinctly curved and ventrally bearing a double row of short black spines and very reduced *va* (Fig. 213). f_1 and f_3 somewhat thickened. Ratio $t_2 : mt_2 = 2.08–2.18$. Wing (Fig. 214) with pale brownish membrane, veins pale brown, Cs_2 strikingly dark, black. *C* extending beyond R_{4+5}. R_{4+5} very slightly bentup to *C* or indistinctly sinuate, not straight. Discal cell of medium length, with fore outer corner acute-angled, hind corner obtuse-angled; a small pigmented appendage of M_{1+2} and M_{3+4} usually developed, that of M_{1+2} continued by colourless venal fold. Alula small, narrow, acute. Wing measurements: length 1.23–1.53 mm, width 0.57–0.66 mm, *C*-index = 0.67–0.74, $t_a – t_p : t_p = 2.58–3.11$. Halteres with yellowish orange stem and large, shiny black knob.

Abdomen black and brilliant shining, dorsally besides triangular area on *T1+2* (Fig. 210) and periandrium completely without pruinosity. *T1+2* long, large. *T3–T5* with some strikingly long pale hair-like bristles on posterior margins. Also sterna relatively long and densely haired. *S5* (Fig. 219) large, wider than all preceding sterna, with medial comb of blunt spines on posterior margin, behind a crown of thick bristles. The medial part of *S5* separated from both lateral parts by narrow, non-sclerotized areas.

Genitalia. Periandrium (Figs. 217, 218) short, with rather short uniform hairs; cerci with somewhat longer hairs. Hypandrium simple, slender, rod-like. Telomere (Fig. 216) bilobed, the external lobe with several longer bristles on anterior margin, its posterior margin only finely pubescent. The internal lobe larger, bearing 3 enormously robust spikes on anterior margin of which the proximal is the largest and directed anterointernally, the middle anteroventrally and the smallest and distal ventroexternally. Aedeagal complex (Fig. 215) with bipartite phallophore and rather simple distiphallus. Postgonite slender, very slightly bent, with enlarged base and somewhat pointed apex. 3 small setulae on anterior margin in apical third and further one on outer side of postgonite. Small ejaculatory apodeme present.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.45–1.84 mm. t_2 and f_2 with different ventral chaetotaxy (without rows of specialized spines) and t_2 very slightly curved (Figs. 211, 212). Ratio $t_2 : mt_2 = 1.79–1.88$. Wing measurements: length 1.47–1.66 mm, width 0.65–0.73 mm, *C*-index = 0.72 to 0.80, $t_a – t_p : t_p = 2.29–2.79$. Preabdomen with *T1+2* as in the male, also terga similarly long bristled. Sterna long haired and sparsely dusted.

Postabdomen (Figs. 220–222) long, narrow, telescopically contractible into preabdomen. *T6* and *T7* relatively short. *T8* short mediodorsally, enlarged laterally, with tripartite pigmentation. *T9* rather long, with 2 dorsal setulae. *S7* wider than *T7*, sparsely and shortly haired. *S8* comparatively large, somewhat transverse, tapering posteriorly, with 2 longer curved ventral bristles. *S9* large, transversely oblong, wider than *T9*, finely pubescent and bearing 4 longer hairs on posterior margin. Spermathecae (Fig. 223) simply cylindrical, with short sclerotized ducts; the paired spermathecae may sometimes coalesce together (Fig. 223, A). Cerci long, relatively robust, each with a long sinuate apical, dorsopreapical and shorter ventropreapical hair and 2 short, curved lateral hairs.

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Discussion: *M. v-atrum* (VILLENEUVE) and *M. ismayi* spec. nov. form a distinctive species-group of the subgenus *Svarciella* with characteristically formed and armed male *S5* and telomere, curved male t_2 with ventral double row of short spines, male f_2 ventrally armed by 2 rows of bristles and shining black abdomen with strikingly long pale haired terga. Female postabdomen also rather diagnostic, especially the dorsally shortened *T8* and large *S8*. *M. ismayi* spec. nov. is the closest relative of *M. v-atrum* having very similar armature of male *S5* and telomere, bipartite phallophore etc. but differs from it by strikingly pale yellowish brown antennae and anterior margin of frons, by larger shining spots on pleurae and by some details in the aedeagal complex and telomere (see discussion under *M. ismayi* spec. nov.).

M. hackmani (ROHÁČEK) shows some affinity to *M. v-atrum* (generally similar male *S5*, black Cs_2, pruinose pleurae) but it is more closely related to *M. splendens* (DUDA). However, *M. unica* (PAPP, 1973) from Mongolia might be a rather closely allied species differing from *M. v-atrum* by entire *C* black, longer *if*, shorter haired terga and 8 rows of *ac* hairs. Because the genitalia of *M. unica* has not been described (PAPP, 1973a), it is impossible to recognize its relationships more exactly.

Limosina guestphalica DUDA, 1918, was synonymized with *M. v-atrum* (VILLENEUVE) by DUDA (1924b) who stated that VILLENEUVE had examined his types and found them to be identical with *M. v-atrum*. Therefore, although I have not been successful in finding VILLENEUVE's (1917) type material, I consider this synonymy to be correct.

Biology: The species occurs rarely in damp deciduous woods, especially boggy forests (DUDA, 1918, 1938; PAPP, 1973c). I have obtained 1 ♀ by sifting leaves in deciduous forest, 1 ♀ in runs of *Microtus arvalis*, 2 ♂ on excrement of red deer and 3 ♂ 3 ♀ by sweeping on peat-bog meadows, mostly at higher altitudes (above 600 m). Adults were recorded from IV—VII and X (combined data of authors mentioned below and material examined). The feeding substrate of the larva is unknown.

Distribution: North and Central Europe — GB: England (RICHARDS, 1930, 1976), Scotland (material examined, new), FRG (DUDA, 1918, 1938), GDR (VILLENEUVE, 1917), Czechoslovakia (ROHÁČEK, 1977b, 1978b), Hungary (PAPP, 1973c), Denmark (material examined, new), Finland (PAPP, 1973b; ROHÁČEK, 1977b), USSR: Estonia (HACKMAN, 1972).

Minilimosina (Svarciella) ismayi spec. nov.

(Figs. 225–234)

Type material: Holotype ♂: Spain, Grazalema nr. Ronda env., ca. 1000 m, 16.—17. 5. 1979, J. ROHÁČEK leg. (JRO).

Description:

Male. Total body length 1.37 mm, general colour black, comparatively shining, sparsely greyish brown dusted. Head black. Frons with reddish brown anterior margin, the rest black. Frontal triangle fairly broad and shining, orbits somewhat silvery dusted and shining, the rest of frons including ocellar triangle and very indistinct interfrontalia dusted, dull. 3 small *if*, the middle a little longer; 2 minute *ads*, *pvt* not found. Frontal lunule yellowish brown, face brown, gena and facial cavity brownish black. Eye large, its diameter 5.6 times the smallest genal width. Antennae pale yellowish brown, sharply contrasting with blackish facial cavity; 3rd segment apically a little darkened and comparatively long pilose. Arista about 3.7 times as long as antenna, medium long ciliate.

Thorax black, greyish brown pollinose, subshining. Mesonotum more shining, pleurae densely dusted and much duller. Thoracic chaetotaxy: 2 *hu*, the internal very minute, 2 short *dc*, 4—6 rows of *ac* hairs between anterior *dc*, the medial prescutellar *ac* pair somewhat enlarged. 2 *stpl*, the anterior minute and hair-like. Sutures between pleural sclerites yellowish brown. Mesopleuron and sternopleuron with pruinose pattern as in Fig. 228. Scutellum rounded triangular, *sc* relatively short. Legs black, trochanters, knes and tarsi yellow to yellowish brown. f_1 and f_3 slightly thickened. t_2 chaetotaxy as in Figs. 225, 226, ventrally with double row of short black spines and a distinct *va*. f_2 ventrally with 2 rows of bristles as in *M. v-atrum*. Ratio t_2: mt_2 = 1.79. Wing (Fig. 229) pale brownish, veins brown Cs_2 black. *C* overpassing R_{4+5}. R_{4+5} slightly bent up to *C*. Discal cell rather long, venal processes of M_{1+2} and M_{3+4} beyond t_p very minute. Alula small, pointed. Wing measurements: length 1.45 mm, width 0.62 mm, *C*-index = 0.76, t_a—t_p: t_p = 3.19. Halteres with yellow stem and black knob.

Abdomen black, dorsally except for the greyish pollinose periandrium and triangular area on *T1+2* lustrous; terga with sparse but long pale hairs, sterna more shortly haired. *T1+2* longer than *T3* and *T4* together. *S5* (Fig. 234) large, wide, with medial comb of blunt spines on posterior margin behind a crown of robust bristles as in *M. v-atrum*, but differs by thick and long lateral bristles. *S6* (Fig. 227) posteriorly with a band-shaped transverse appendage carrying 2 small processes, each with 3 small setulae.

Genitalia. Periandrium (Figs. 232, 233) uniformly shortly haired. Hypandrium comparatively long, slender, rod-like. Cerci well differentiated, each with 5 hair-like bristles. Telomere of complex form, bilobed (Fig. 231). External lobe smaller (in contrast to that of *M. v-atrum*) than internal lobe and bearing a group of longer bristles. The internal lobe with extremely robust spines, differently oriented than those of *M. v-atrum*. Aedeagal complex (Fig. 230) with bipartite phallophore, slender and simple distiphallus, longer than that of *M. v-atrum* and slender, dark pigmented postgonite of very characteristic form and with 2 setulae on anterior margin in apical third and 2 usual setulae on basal tubercle. Ejaculatory apodeme present but small.

Female unknown.

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Discussion: The species is very closely allied to *M. v-atrum* (VILLENEUVE) but is easily separable from it by paler antennae, larger shining spots on pleurae, armature of male *S5* and *S6*, differently situated spines and bristles on telomere, longer male cerci, longer distiphallus and differently shaped postgonite. *M. ismayi* spec. nov. and *M. v-atrum* form a separate group within the subgenus *Svarciella* (see discussion under *M. v-atrum*).

Biology: Unknown. The holotype was swept from vegetation by stream.

Distribution: South Spain (material examined).

Remarks: The species is dedicated to my friend, Dr. JOHN W. ISMAY (UMO) for his invaluable help in the preparation of this study and many years' kind improvement of the English of my articles.

Subgenus ***Minilimosina*** s. str.

Type species: *Limosina fungicola* HALIDAY, 1836

Diagnosis: The subgenus can be characterized as follows.

(1) *pvt* small or absent
(2) 3—4 small *if* about of equal length
(3) 4—6 minute *ads* inside and below *ors*
(4) *g* of medium length
(5) head with strongly protruding carina between antennae
(6) 2 *hu*, the internal very minute
(7) 1 *dc* in prescutellar position
(8) 6—8 rows of *ac* hairs in front of suture
(9) 2 *stpl*, the anterior small
(10) mesopleuron and sternopleuron pruinose, often with small shining spots
(11) scutellum rounded triangular
(12) t_2 chaetotaxy (Figs. 246—248), ventrally with only *va*; male f_2 with a short basal row of ventral bristles (Fig. 246)
(13) *C* extended far beyond R_{4+5}
(14) *C*-index usually over 0.70 (mostly 0.80—1.00)
(15) R_{4+5} slightly bent up to *C* or slightly sinuate
(16) discal cell of medium length, its posterior outer corner not acute
(17) alula small, narrow, pointed
(18) *T1+2* shorter than *T3* and *T4* together
(19) female postabdomen long, narrow, telescopically retractile
(20) male *S5* with medial comb(s) of spines on posterior margin
(21) periandrium small, uniformly haired; cerci often with some longer hair-like bristles
(22) hypandrium medium-sized, rod-like
(23) telomere flat, shorter than wide, with internal flat projections or lobes and always with posterior, short, robust and blunt spine
(24) phallophore shorter and compact
(25) distiphallus simply formed and sclerotized
(26) postgonite usually slender, its apex never pointed
(27) ejaculatory apodeme often developed but small
(28) female *T6* and *T7* dorsomedially shortened or membraneous; *T8* long, with tripartite pigmentation
(29) female *T9* long, narrow, with 2 dorsal setulae
(30) female *S8* reduced to a narrow sclerite, often of complex form
(31) female *S9* large, broad, with simple anterior margin
(32) an internal sclerite (homologous with the "spectacles-shaped sclerite") present in some species
(33) spermathecae oval to cylindrical
(34) female cerci slender, each with 3 long sinuate and 2 short curved hairs.

Discussion: The subgenus seems to be more closely related to *Allolimosina* subgen. nov. (shared features: 1 *dc*, shorter *T1+2*, shortly haired preabdominal terga, flat and low

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telomere, reduced female *S8*), but its wing venation is less modified, hypandrium and female *S8* less reduced and female *S9* simple. Therefore, *Minilimosina* s. str. is thought to be a more primitive group than subgenus *Allolimosina* and closer to their common ancestor (see chapter "Phylogeny"). Besides the above, apparently plesiomorphic features, *Minilimosina* s. str. differs from *Allolimosina* by two obviously autapomorphic characters — thick, short posterior spine on telomere and ventral basal row of bristles on male f_2.

The subgenus *Minilimosina* s. str. comprises 8 Palaearctic species, 5 of which were recorded from Europe, viz. *M. tenera* spec. nov., *M. fungicola* (HALIDAY, 1836), *M. gemella* spec. nov., *M. trogeri* spec. nov., and *M. parvula* (STENHAMMAR, 1854). 3 species were described by PAPP (1974d) from Mongolia — *M. meszarosi* (PAPP, 1974) comb. nov., *M. parafungicola* (PAPP, 1974) comb. nov. and *M. similissima* (PAPP, 1974) comb. nov. The subgeneric position of *M. microtophila* (PAPP, 1973) comb. nov. is not recognizable from the original description (PAPP, 1973a) but it might belong to subgenus *Minilimosina* s. str. Similarly the Nearctic *M. nasuta* (SPULER, 1925) possibly belongs to the above subgenus although its placement in subgenus *Svarciella* is not wholly impossible (see discussion under *Svarciella* subgen. nov.).

Minilimosina (Minilimosina) tenera spec. nov.

(Figs. 235–237, 239–245)

Type material: Holotype ♂: Czechoslovakia, Moravia, H. Jeseník Mts., peat-bog Skřítek, 16. 8. 1977, on decayed fungi, J. ROHÁČEK leg. Genitalia dissected and together with detached abdomen preserved in plastic tube with glycerine pinned below specimen (SMO).

Description:

Male. Total body length 1.07 mm, general colour blackish brown, subshining. Head brownish black. Frons with shining black, long frontal triangle; ocellar triangle, occiput, narrow interfrontalia and orbits silvery dusted and shining; narrow stripes between interfrontalia, orbits and frontal triangle dull, brownish black dusted. Cephalic bristles short. 4 small *if* of equal length, *pvt* very minute, *occe* and *occi* less reduced than those of *M. fungicola*, 4 minute *ads*. A narrow anterior margin of frons and frontal lunule brown. Carina strongly protruding from facial cavity, the latter relatively shining. Gena black, brown dusted, *g* well developed. Face with 3–4 small setulae below eye. Eye relatively small its largest diameter about 2.2 times the narrowest genal width. Antennae brownish black, 3rd segment comparatively long, pale yellowish white ciliate. Arista about 3.4 times as long as antenna, very long and densely ciliate.

Thorax blackish brown, brownish pruinose. Mesonotum relatively shining, pleurae more dusted and duller. Mesonotal Mesonotal chaetotaxy: 1 *dc* in prescutellar position, 6–8 rows of irregular *ac* microsetae, the prescutellar medial *ac* pair somewhat enlarged. Mesopleuron and sternopleuron with shining spot above fore coxa (Fig. 235). 2 *stpl*, the anterior very minute. Scutellum rounded triangular, apical *sc* longer than scutellum. Legs brown, trochanters and tarsi somewhat paler. f_2 ventrally with a short row of 3 short bristles. t_2 chaetotaxy as in Figs. 236, 237, ventrally with only *va*. Ratio t_2: mt_2 =1.78. Wing (Fig. 239) whitish, veins very pale with exception of brown *C*. *C* distinctly overpassing R_{4+5}. R_{4+5} slightly bent to *C*. Discal cell of medium length, the processes of M_{1+2} and M_{3+4} beyond t_p indistinct but its outer corners not rounded. Alula small, narrow. Wing measurements: length 1.01 mm, width 0.49 mm, *C*-index = 0.69, $t_a - t_p : t_p = 2.75$. Halteres brown, stem yellowish brown.

Abdomen with shining and sparsely haired terga; only *T1+2* basally with some pollination. All terga with fine transverse microsculpture as in related species. Sterna and periandrium distinctly pruinose and more haired. *T1+2* about as long as *T3* and *T4* together. *S5* (Fig. 245) with peculiar armature. In front of the usual posterior medial comb of spines there are 4 further combs of medially enlarged spines, the most posterior of them is composed of long spines overlapping the regular posterior comb (Fig. 244). Pigmentation of *S5* also rather characteristic.

Genitalia. Periandrium (Figs. 240, 241) uniformly shortly haired, pruinose. Cerci ventrally protruding and each carrying 2 very long hair-like bristles and a number of small setulae. Hypandrium of medium length. Telomere (Fig. 242) flat, low, with usual posterior robust, short and blunt spine and posteroventrally with 3 thick, sharp spines, the most posterior of which arising on rod-like projection. Aedeagal complex (Fig. 243) very characteristic. Phallophore and distiphallus unusually thick, but very simple. Postgonite robust, s-shaped, thus unlike that of related species. Ejaculatory apodeme present, very small.

Female unknown.

Discussion: *M. tenera* spec. nov. is an easily recognizable species of the subgenus *Minilimosina* s. str. differing from all the related species in having the largest shining spots on pleurae, very long ciliate arista, low *C*-index and number of peculiarities in the formation and armature of the male genitalia (*S5*, cercus with 2 very long bristles, telomere, robust aedeagal complex etc.). Its minute body and pale wings also rather characteristic.

Judging from the formation of the male aedeagal complex and wing venation, the species appears to be the most distant relative of the *M. fungicola* alliance. Its wing venation and armature of male *S5* indicate some similarities with the species of the subgenus *Svarciella*, but the formation of hypandrium, telomere and preabdominal terga places it unambiguously in *Minilimosina* s. str. *M. parafungicola* (PAPP, 1974) and *M. similissima* (PAPP, 1974) from Mongolia (both unfortunately insufficiently described) might be related species. They differ from *M. tenera* spec. nov. by larger body and wings, higher *C*-index, shortly haired genitalia and different male *S5*.

Biology: The holotype was caught on decaying fungi on peat-bog, ca. 820 m a.s.l.

Distribution: Czechoslovakia (material examined).

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Minilimosina (Minilimosina) fungicola (HALIDAY, 1836), comb. nov.

(Figs. 238, 246–258)

Limosina fungicola HALIDAY, 1836: 330; COLLIN, 1956: 174; PAPP, 1973c: 52 (key) (part.)
Leptocera (Limosina) fungicola: RICHARDS, 1930: 293 (?part.)
Leptocera fungicola: SÉGUY, 1934: 466 (part.)
Limosina exigua RONDANI, 1880: 24
Limosina (Scotophilella) exigua: DUDA, 1918: 120 (part.)
Leptocera (Scotophilella) exigua: DUDA, 1925: 155, 158 (key) (part.)
Limosina (Limosina) exigua: DUDA, 1938: 120 (part.)
Leptocera exigua: NARTSHUK, 1970: 347 (key) (part.)

Type material:
Limosina fungicola HALIDAY: Lectotype ♂ (des. by COLLIN in 1953) labelled: "Holywood" (green label), "HALIDAY 20. 2. '82" (registration number of museum), "Named by J. E. COLLIN" and "*fungicola* HAL. Lectotype COLLIN 1953" (in COLLIN's handwriting). Paralectotype ♀ glued on the same label as lectotype (NMI, examined). COLLIN (1956) designated as lectotype a pair of specimens glued on the same card. Although both the specimens are conspecific, it is necessary that only one of them be considered lectotype. Therefore I have designated the male as lectotype and the female as paralectotype.
Limosina exigua RONDANI: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "Asch 3 1872" and "1929" (a catalogue No. – red numeral on oval label); Paralectotypes 1 ♂ 1 ♀ labelled as lectotype (MSF).

Material examined (besides "Type material"): 93 ♂ 113 ♀

Spain: 5 ♂ 11 ♀ (JRO) – Güejar Sierra nr. Granada, Sierra Nevada Mts.-Llano Prado (ROHÁČEK leg.).

Ireland: 1 ♀ (BML, NMI) – Co. Clare: The Burren-Kilnaboy (COE leg.), Holywood (HALIDAY leg.),

GB: 16 ♂ 16 ♀ (BML) – England: Bristol-Redland (PONT leg.), Kirtling, Newmarket, Chippenham (VERRALL leg.) Oxford, Nuneham-Courtenay (PONT leg.); Essex: Shoeburyness (DEEMING leg.); Herts: Letchworth (EDWARDS leg.), Felden (PIFFARD leg.); Kent: Beckenham (VANE-WRIGHT leg.), Bickley (DEAR leg.); Berks: Bagley Wood, Windsor Pl. (RICHARDS leg.); Middlesex: Potters Park (DEEMING leg.); Ashperton Park (WOOD leg.) – Wales: Cardigan: Wandoe (RICHARDS leg.) – Scotland: Perths: Glendevon (DEAR leg.); Banff: Tomintoul (COE leg.); Aberdeen: Balmoral Forest (COE leg.).

FRG: 3 ♂ (ZMB) – Westfalen: Herten (DUDA leg.); Rheinland: St. Wendel (DUDA leg.).

GDR: 5 ♂ 2 ♀ (ZMB) – S. Harz-Ilfeld (DUDA leg.), Frankfurt an Od. (SCHUKATSCHEK leg.).

Poland: 1 ♂ (ZMB) – Wustung b. Habelschwerdt (DUDA leg.).

Czechoslovakia: 27 ♂ 51 ♀ (JRO, SMO, MHK) – Bohemia: Doupov Mts.-Lochotín (ROHÁČEK leg.), Malá skála (MOCEK leg.), Palupín nr. Strmilov (ROHÁČEK leg.); Moravia: Třešť, Řásná nr., Telč, Mor. Kras-Býčí skála, Hradec n. M., Brumovice, Klokočov (distr. Opava), H. Jeseník Mts.-Skřítek, Keprník Mt. (ROHÁČEK leg.); Slovakia: Kremnické poh. Mts.-Turček, Belanské Tatry Mts.-Zadné Meďodoly (ROHÁČEK leg.).

Bulgaria: 3 ♂ (IZS) – Sofia-Geleznitza (BESHOVSKI leg.).

Denmark: 24 ♂ 22 ♀ (ZMK) – SJ: Sønderborg (WÜSTNEI leg.); EJ: Ry (LUNDBECK leg.); NEJ: Løkken (MORTENSEN leg.); F: Taasinge (LUNDBECK leg.); LFM: Nysted (LUNDBECK leg.); SZ: Suserup Skov (LUNDBECK leg.);, NEZ: Holte (LUNDBECK, MORTENSEN leg.), Skodsborg, Hillerød, Ordrup Mose (LUNDBECK leg.), Bagsvaerd, Brordrup (LYNEBORG leg.), Hareskov (OVERGAARD leg.).

Finland: 9 ♂ 10 ♀ (ZMH) – Al: Saltvik (FREY leg.), Finnström (NORDBERG leg.); Ab: Lojo (HACKMAN leg.), Särkisalo, Petu (ORMIO leg.); N: Esbo, Hoplax, Helsinge-Linna (FREY leg.), Helsinge (FREY, HELLÉN leg.), Evitskog (HACKMAN leg.), Borgå-Seitlax (NORDMAN leg.).

Description:
Male. Total body length 1.03–1.33 mm, general colour brownish black, brown dusted, subshining. Head black. Frons with a narrow, long and shining frontal triangle, silvery pollinose interfrontalia, orbits and ocellar triangle and black pollinose, dull stripes between orbits, interfrontalia and frontal triangle. 3–4 short *if* of approximately equal length, 3–6 minute *ads*, very small *occi* and *occe*, *pvt* not developed. Frontal lunule dark brown, facial cavity shining black with strongly protruding carina; face and gena black but brown pollinose, the latter with a small shining spot below eye. *g* distinct. Eye of medium size, its diameter about 2.9–3.1 times the smallest genal width. Antennae black, 3rd segment dark brown and ciliate as long as arista. Arista 3.1 times as long as antenna, with rather long and dense (but shorter than in *M. tenera* spec. nov.) ciliation.

Thorax black, dark brown pollinose. Mesonotum scarcely pruinose and rather shining, pleurae densely pollinose and except for the shining spot on sternopleuron (Fig. 238) dull. Mesonotal chaetotaxy as defined for the subgenus, i.e. 1 short *dc*, 8 rows of *ac* hairs in front of suture, the prescutellar medial *ac* pair enlarged. Pleurae with yellowish brown sutures between pleural sclerites. 2 *stpl*, the anterior minute. Scutellum small, rounded triangular, with short *sc* (apical *sc* shorter or as long as the scutellum). Legs brown, trochanters, knees and tarsi pale brown. f_2 ventrally proximally with a short row of 3–4 bristles. t_2 chaetotaxy similar to that of related species (Fig. 246), *ad* in apical fourth longer than the adjacent *pd*. Ratio t_2: mt_2 = 1.62–1.83. Wing (Fig. 249) with pale brownish membrane, veins brown. *C* very far extended beyond R_{4+5}. R_{4+5} slightly (but most distinctly of all congeners) sinuate, apically almost straight. Discal cell relatively long, its anterior outer corner usually less acute angled than in *M. parvula*; the venal processes of M_{1+2} and M_{3+4} beyond t_p more or less developed, always short, sometimes that of M_{3+4} absent and the posterior corner almost rounded. Alula small, narrow, acute. Wing measurements: length 1.12–1.36 mm, width 0.52–0.64 mm, *C*-index = 0.79–1.02, t_a–t_p: t_p = 2.60–3.11. Halteres with blackish brown knob and yellowish brown stem.

Abdomen dark brown. Terga very sparsely haired, without pruinosity, very shining and with transverse microsculpture being rougher than that of *M. parvula*. *T1+2* slightly shorter than *T3* and *T4* together, basally narrowly pruinose. All sterna and periandrium pruinose and more densely haired. *S5* (Fig. 254) comparatively simple, with small medial comb of spines on posterior margin, partly covered by fine hairs and spines arising in front of it. The disc of *S5* rather long but simply haired.

Genitalia. Periandrium (Figs. 252, 253) small, smaller than that of *M. parvula*, sparsely and uniformly haired. Cerci each with one longer bristle and some shorter hairs. Hypandrium of medium length. Telomere (Fig. 251) of complex form, with internal projections but generally short and flat; ventrally with characteristic row of bristles (4 thicker strongly hook-like curved), posteriorly with a usual thick and short spine, outer side with a row of bristles, the most posterior the longest. Aedeagal complex (Fig. 250) with simple phallophore and rather characteristic distiphallus; postgonite slender, dark pigmented especially on posterior margin and with 3 small setulae in apical third on anterior margin. Ejaculatory apodeme not observed.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.14 to 1.61 mm. *ac* hairs in 8–10 rows in front of suture. f_2 basally without short row of *pv* bristles. All bristles on t_2 generally longer, especially the *va* (Figs. 247, 248). Ratio t_2: mt_2 = 1.66–1.72. R_{4+5} mostly more distinctly sinuate than in male. Wing measurements: length 1.12–1.55 mm, width 0.57–0.76 mm, *C*-index = 0.83–1.03, t_a–t_p : t_p = 2.46–3.30.

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Abdomen with shining terga and subshining, sparsely pollinose sterna. The transverse microsculpture on *T1+2 – T4* very strong.

Postabdomen (Figs. 255–257) pruinose, narrow, telescopically retractile. *T6* and *T7* dorsomedially shortened but not membraneous. *T8* long, with tripartite pigmentation. *T9* long, narrow, medially pale pigmented, with a pair of small dorsal setulae. *S6* and *S7* simple, relatively long. *S8* characteristically reduced to a long, narrow, medially darker pigmented sclerite with 2 longer setulae on posterior margin. *S9* large, broad, with some longer setulae on posterior margin. Spermathecae (Fig. 258) oval, with comparatively short sclerotized parts of ducts being enlarged subterminally. Cerci long, slender, each with 3 long sinuate hairs and some short curved ones. The dorsopreapical sinuate hair not thickened.

Preimaginal stages: GODDARD (1938: 242, Fig. 3) described and illustrated a puparium he found in a mouse burrow. This puparium is probably that of above described species although it is not impossible it is *M. parvula* (STENHAMMAR).

Discussion: The species is very closely allied to *M. gemella* spec. nov. and differs from it only by the usually higher *C*-index, armature of male *S5*, telomere and some details in aedeagal complex. The female of *M. gemella* spec. nov. is unknown but the form of its *S8* might be probably different. The other species are more different having no shining spot on sternopleura, longer apical *sc*, longer *pd* and short *ad* on t_2 apart from the peculiarities in the male and female postabdomina.

All previous authors (e.g. DUDA, 1918, 1938; RICHARDS, 1930; SÉGUY, 1934; PAPP, 1973c) mixed under *Limosina fungicola* HALIDAY (or *L. exigua* RONDANI) at least 2 commoner species, i.e. *M. fungicola* (HALIDAY) and *M. parvula* (STENHAMMAR). On the other hand, the identity of *Limosina exigua* RONDANI, 1880, with *M. fungicola* (HALIDAY) has been confirmed by examination of types of both these species. It is rather surprising that the above described species is really HALIDAY's *Limosina fungicola* because it was found to prefer decaying vegetation (see below) and to occur only occasionally on fungi whereas *M. parvula* (STENHAMMAR) is apparently associated with the latter habitat.

Biology: The species is in contrast with *M. parvula* associated mainly with decaying herbaceous matter (often on compost or dump heaps), though sometimes I have collected it on excrement, on carrion and in burrows of small mammals (*Microtus agrestis*, *Pitymys* spec., *Arvicola* spec.); I have seen only 2 specimens caught on decayed fungi. There are numerous records of the biology of this species in the literature (RICHARDS, 1930; DUDA, 1938; HACKMAN, 1967a; PAPP, 1973c etc.) but they cannot be used without revision of respective specimens. According to the material examined, adults occur during the whole year.

Distribution: Not precisely known. The only verified data are taken from the material examined; all recorded data need to be confirmed by examination of the specimens. The species is possibly widely distributed in Europe and Palaearctic. Positively known from Spain, Ireland, GB: England, Wales, Scotland, FRG, GDR, Poland, Czechoslovakia, Bulgaria, Denmark, Finland.

Minilimosina (Minilimosina) gemella spec. nov.

(Figs. 259–262)

Type material: Holotype ♂: Austria, Tyrol, Obergurgl Mt., 1, 980 m, 25. 8.–2. 9. 1977, H. TROGER leg.; Paratype ♂ with same data as for holotype (JRO).

Description:

Male. Total body length 1.27–1.31 mm, general colour brownish black, rather shining. Head brownish black. Orbits, interfrontalia, ocellar triangle and occiput silvery dusted and relatively shining, narrow and long frontal triangle shining black, the rest of frons black dusted and dull. *pvt* very minute, *occi* and *occe* small; 4 small *if* of equal length, 4–6 minute *ads*. Frontal lunule silvery grey dusted, facial cavity black and shining; gena black, brown dusted, only a small spot below eye shining. *g* distinct. Eye of medium size, its largest diameter about 3.0 times the narrowest genal width. Antennae blackish brown, 3rd segment pubescent as long as arista. Arista about 3.9 times as long as antenna, medium long ciliate.

Thorax black, greyish brown dusted, mesonotum more shining. 1 small prescutellar *dc*, 6–8 rows of *ac* hairs in front of suture, the prescutellar innermost pair a little enlarged. Pleurae more dusted and duller, sternopleuron with a shining spot like that of *M. fungicola*. 2 usual *stpl* present. Scutellum roundly triangular, *sc* short, apical *sc* not longer than scutellum. Legs brownish black, trochanters, knees and tarsi paler brown. f_2 and t_2 chaetotaxy quite similar to that of *M. fungicola*, including the small *pd* and longer *ad* in apical fourth of t_2. Ratio t_2: $mt_2 = 1.67–1.74$. Wing (Fig. 259) with very pale brown membrane, veins brown. *C* far overpassing R_{4+5}. R_{4+5} slightly sinuate, apically upcurving to *C*. Discal cell rather large, broad; its outer corners with processes of M_{1+2} and M_{3+4}, the latter may even absent. Alula small, pointed. Wing measurements: length 1.32–1.34 mm, width 0.63–0.64, *C*-index = 0.71–0.89, $t_a – t_p : t_p = 2.64–2.73$. Halteres with large blackish brown knob and pale yellowish brown stem.

Abdomen. Terga very shining, only laterally sparsely haired, with fine transverse microsculpture. *T1+2* not longer than *T3* and *T4* together. Sterna, *T5* basally and periandrium greyish brown pruinose. Sterna more densely haired. *S5* (Fig. 260) similar to that of *M. trogeri* spec. nov. but the medial posterior projection shorter and the lobe in front of it more densely and finely spinulate.

Genitalia. Periandrium similar to that of *M. fungicola*, uniformly shortly haired. Cerci each with a long hair-like bristle (longer than in *M. fungicola*) besides some small setulae. Telomere (Fig. 261) flat, with internal projections, somewhat similar to that of *M. fungicola* but ventrally differently armed – the middle ventral robust, short and blunt spine especially characteristic. Aedeagal complex (Fig. 262) also similar to that of *M. fungicola* but distiphallus and postgonite different in details. Ejaculatory apodeme relatively large in contrast to all allied species.

Female unknown.

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Discussion: The species is extremely closely related to *M. fungicola* (HALIDAY) having similarly pruinose pleurae, short *sc*, t_2 chaetotaxy, similar periandrium and aedeagal complex. It differs from it by usually lower *C*-index, *S5* with robust medial projection similar to that of *M. trogeri* spec. nov., telomere with characteristic blunt, short medioventral spine besides the usual posterior one, by somewhat different distiphallus and postgonite and by presence of comparatively large ejaculatory apodeme.

M. gemella spec. nov. cannot be identical with any of the species described by PAPP (1974d) from Mongolia all of which have differently formed male *S5*.

Biology: Type specimens were taken by photoeclector (emergence trap) in a manured alpine meadow at the valley floor in altitude 1,980 m.

Distribution: Austria (Central High Alps).

Minilimosina (Minilimosina) trogeri spec. nov.

(Figs. 263–270)

Type material: Holotype ♂: Austria, Tyrol, Obergurgl Mt., 1,950 m, 18. 9. 1975, H. TROGER leg. Abdomen detached and preserved in plastic tube with glycerine pinned below specimen. Allotype ♀ with same data but collected 12. 9. 1975. The specimen is preserved in plastic tube with glycerine pinned on a pin. Paratypes: 1 ♂ with same data as for holotype but collected 29. 8. 1975 (all JRO); 2 ♂ Finland, N: Helsinge, Linna, No. 1997 and 2105, R. FREY leg. (ZMH).

Description:

Male. Total body length 1.18–1.42 mm, general colour blackish brown, subshining. Head dark brown. Frons dusted and dull but a long frontal triangle shiny, interfrontalia and orbits silvery grey dusted, subshining; *pvt* very minute, *occi* and *occe* well developed as in *M. parvula*. 4 *if* of equal length, 4–5 minute *ads*. Facial cavity, face and gena dark brown, facial cavity and a small spot below eye shining. *g* distinct. Eye normal, its diameter about 3.7 times the smallest genal width. Antennae brown, 3rd segment longer ciliate than arista. Arista about 3.5 times as long as antenna.

Thorax blackish brown, brown dusted. Mesonotum subshining, pleurae completely, more densely dusted and duller. Mesonotal chaetotaxy: 1 *dc* in prescutellar position, 6 rows of *ac* hairs, the medial prescutellar *ac* pair a little longer than others. 2 *stpl*, the anterior minute. Scutellum roundly triangular, apical *sc* much longer than scutellum. Legs brown, trochanters, knees and tarsi rather paler. f_2 and t_2 chaetotaxy as in *M. parvula*, thus *ad* in apical fourth of t_2 shorter than the adjacent *pd*. Ratio t_2: $mt_2 = 1.67–1.81$. Wing (Fig. 266) very pale brownish, veins brown, *C* the darkest and considerably extended beyond R_{4+5}. R_{4+5} very slightly bent up to *C*, its apical part almost straight. Discal cell relatively long, its anterior outer corner acute, posterior one obtuse-angled, both with minute processes of M_{1+2} and M_{3+4}. Alula small, narrow, pointed. Wing measurements: length 1.15–1.39 mm, width 0.53–0.62 mm, *C*-index = 0.78–1.05, $t_a–t_p$: $t_p = 2.50–3.40$. Halteres with yellow stem and brown knob.

Abdomen sparsely haired, terga almost without pruinosity, shiny, with very fine transverse microsculpture. Sterna more heavily dusted and densely haired. *T1+2* shorter than *T3* and *T4* together. *S5* (Fig. 263) with fourfold comb of spines on medial posterior lobe and with a robust, heavily sclerotized projection (longer than that of *M. gemella* spec. nov.) protruding behind this lobe, otherwise rather long and densely setose.

Genitalia. Periandrium as in related species (e.g. *M. parvula*), uniformly shortly haired. Cerci each with one longer and some short hairs. Hypandrium of medium length. Telomere very characteristic (Fig. 264), flat, externally with low lobe projecting anteroventrally, internally with flat, longer lobe carrying 2 curved spines and some thicker setulae. The usual posterior spine very robust. Aedeagal complex (Fig. 265) similar to that of *M. parvula* but differing in details (e.g. postgonite, phallophore).

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.47 mm. f_2 ventrally without a basal row of bristles, t_2 chaetotaxy corresponding with that of male but all bristles somewhat longer. Ratio t_2 : $mt_2 = 1.65$. Wing measurements: length 1.34 mm, width 0.63 mm, *C*-index =1.03, $t_a–t_p$: $t_p = 2.45$. Abdomen with *T1+2* shorter than *T3* and *T4* together, *T5* large, longer than *T4*.

Postabdomen (Figs. 267–269) pruinose, long, narrow, telescopically retractile but generally shorter than that of *M. parvula*. *T6* and *T7* dorsomedially weakly sclerotized and pale pigmented as in *M. parvula*. *T8* with usual tripartite pigmentation. *T9* long, narrow, medially pale pigmented. *S6* and *S7* simple, relatively long, haired only on posterior margin. *S8* reduced to a long, narrow sclerite of characteristic shape (a little resembling that of *M. fungicola*). *S9* large, wide, with some longer setulae on posterior margin. Inside postabdomen there is an internal sclerite as in *M. parvula*. Spermathecae (Fig. 270) vesiculate, in contrast to related species with longer sclerotized parts of ducts. Cerci shorter than in *M. parvula* and haired as in *M. fungicola*, thus without thickened dorsopreapical sinuate hair.

Discussion: The species is closely related to *M. parvula* (STENHAMMAR) having similar male aedeagal complex (especially distiphallus), distinctly weakly sclerotized medial part of female *T6* and *T7*, similar pruinose pleurae, long apical *sc* and other external body characters, but differs by male *S5* (similar to that of *M. gemella* spec. nov.), peculiar telomere and female *S8*, and cerci resembling more those of *M. fungicola* (HALIDAY). The telomere looks like that of *Allolimosina* species — this fact should be regarded as an evidence of closer relationship of *Minilimosina* s. str. and *Allolimosina* subgen. nov.

Biology: Some of the type specimens were caught by means of the photoeclector (emergence trap) in manured alpine meadow (1,950 m), in VIII–IX (cf. TROGER & ROHÁČEK, 1980 — as *Limosina fungicola* HALIDAY).

Distribution: Austria (Central High Alps) and Finland. Probably a Boreo-alpine species.

Remarks: I have named this new species after my colleague Dr. HANS TROGER (IZI) who collected it during his extensive investigations on alpine entomofauna.

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Minilimosina (Minilimosina) parvula (STENHAMMAR, 1854), **comb. nov.**

(Figs. 271–286)

Limosina parvula STENHAMMAR, 1854: 422 ROHÁČK, 1981:165
Leptocera (*Limosina*) *fungicola*: RICHARDS, 1930: 293 (part.)
Leptocera fungicola: SÉGUY, 1934: 466 (part.)
Limosina fungicola: PAPP, 1973c: 52 (part.)
Limosina (*Scotophilella*) *exigua*: DUDA, 1918: 120 (part.)
Leptocera (*Scotophilella*) *exigua*: DUDA, 1925: 155, 158 (key) (part.)
Limosina (*Limosina*) *exigua*: DUDA, 1938: 120 (part.)
Leptocera exigua: NARTSHUK, 1970: 347 (key) (part.)

Type material: Lectotype ♀ (des. by ROHÁČEK in 1979) labelled: "3.", "V. N." and "*parvula*" (STENHAMMAR's handwriting). The specimen is headless. Paralectotype ♀ unlabelled and without abdomen, located together with the lectotype in the drawer *S23* (II) of STENHAMMAR's collection (ZIU).

Material examined (besides "Type material"): 148 ♂ 109 ♀

GB: 2 ♂ 2 ♀ (BML) — England: Coobersale (COLYER leg.); Berks: Windsor Great Park, Silwood Park-Sunninghill (OKELY leg.). — Scotland: Perths: Coshieville (PARMENTER leg.).

Poland: 1 ♂ 2 ♀ (ZMB) — Wustung b. Habelschwerdt, Rauden nr. Glivice (DUDA leg.).

Czechoslovakia: 110 ♂ 85 ♀ (MHK, JRO, SMO) — Bohemia: Doupovské hory Mts.-Lochotín, Palupín nr. Strmilov, Slavonice-Janov (ROHÁČEK leg.), Černá nr. Bohdaneč, Malšovice (MOCEK leg.); Moravia: Třešť, Řásná nr. Telč (ROHÁČEK leg.), Číchov nr. Třebíč (HAVLENA leg.), Pohořelice (MOCEK leg.), Lednice, Adamov, Mor. Kras-Babice, Brno-Ledná, Brno-Soběšice, Vršovice nr. Opava, Hněvošice, N. Lublice (distr. Opava), H. Jeseník Mts.-Skřítek, Rejvíz (ROHÁČEK leg.); Slowakia: Kremnické poh. Mts.-Turček, Patince nr. Komárno, Belanské Tatry Mts.-Tatranská Kotlina, Vihorlat Mts.-R. Hámre (ROHÁČEK leg.).

Bulgaria: 1 ♂ (IZS) — Plana (BESHOVSKI leg.).

Denmark: 6 ♂ (ZMK) — NWJ: Agger (MORTENSEN leg.); NEZ: Holte, Geel Skov (MORTENSEN leg.).

Finland: 28 ♂ 20 ♀ (ZMH) — Al: Marienhamn (NORDBERG leg.); Ab: Vihti (HACKMAN, FREY leg.), Karislojo (HACKMAN, FORSIUS leg.), Lojo (FREY leg.), Särkisalo-Petu (ORMIO leg.); N: Helsinki (HACKMAN leg.), Helsinge (HELLÉN leg.), Helsingin ymp. (TIENSUU leg.), Esbo, Hoplax, Dickursby (FREY leg.), Kyrkslätt (HELLÉN leg.); Ta: Tavastehus (HELLÉN leg.); Om: Nykarleby (FREY leg.); LkW: Muonio (PALMÉN leg.); Le: Kilpisjärvi (NORDMAN leg.).

Description:

Male. Total body length 1.03–1.39 mm, general colour brownish black, brown dusted. Head black, its colouring and pruinosity as in *M. fungicola*. *pvt* distinctly developed and *occi* and *occe* much larger than those of *M. fungicola*. 4 (rarely 3) *if* of about equal length, 4–6 minute *ads*. Anterior margin of frons sometimes brown. *g* well developed. Eye of normal size, its diameter about 3.1 times the smallest genal width. Antennae black, 3rd segment relatively long ciliate. Arista about 3.3 times as long as antenna and rather long ciliate.

Thorax brownish black, with brown pruinosity. Mesonotum more shining. 1 *dc* in prescutellar position, longer than in *M. fungicola*. 8 rows of *ac* hairs, the prescutellar medial pair of *ac* enlarged. Entire pleurae pruinose, duller than mesonotum. Sutures between pleural sclerites yellowish brown; 2 *stpl*, the anterior minute. Scutellum roundly triangular, longer than in *M. fungicola* and with longer *sc*; the apical *sc* considerably longer than scutellum. Legs brown to brownish black (femora, tibiae), trochanters and tarsi paler. f_2 basally with a longer row of *pv* bristles (Fig. 271), t_2 chaetotaxy similar to that of *M. fungicola* but *ad* in apical fourth shorter than the adjacent *pd* (Fig. 272). Ratio $t_2 : mt_2 = 1.48–1.64$. Wing (Fig. 274) very pale yellowish brown, also veins pale brownish, only *C* darker. *C* far overpassing R_{4+5}. R_{4+5} distinctly bent up to *C*. Discal cell usually shorter than in *M. fungicola*, its anterior outer corner acute as a rule. Very short processes of M_{1+2} and M_{3+4} present beyond discal cell. Alula small, narrow, pointed. Wing measurements: length 1.12–1.37 mm, width 0.51 to 0.62 mm, *C*-index = 0.88–0.98, $t_a–t_p : t_p = 1.91–2.56$. Halteres with yellowish brown stem and blackish brown knob.

Abdomen with shining and sparsely haired terga (only *T1+2* basally narrowly pruinose), sterna and periandrium pollinose, duller and more densely haired. Terga with transverse microsculpture, finer than in *M. fungicola*. *S5* (Fig. 279) with dense and stout bristles on disc and with medial comb of blunt spines inserted on darkly pigmented lamella on posterior margin.

Genitalia. Periandrium (Figs. 277, 278) relatively large, uniformly but rather long haired. Cerci each with 2 longer, hair-like bristles and a number of short setae. Hypandrium of medium length, rod-like. Telomere (Fig. 276) flat, with internal flat projection, ventrally finely haired, externally with some setulae and posteriorly with the usual robust, short and blunt spine. Aedeagal complex (Fig. 275) with simple phallophore; distiphallus similar to that of *M. trogeri* spec. nov. but postgonite different, more s-shaped and apically shortly hook-like pointed. Ejaculatory apodeme present but small.

Female. Similar to male but difffers as follows. Total body length 1.09–1.66 mm. f_2 without *pv* basal row of bristles. t_2 chaetotaxy (Figs. 272, 273), all bristles somewhat longer than in male. Ratio $t_2 : mt_2 = 1.52–1.67$. Wing measurements: length 1.18–1.55 mm, width 0.51–0.70 mm, *C*-index = 0.93–1.06, $t_a–t_p : t_p = 2.18–2.50$.

Postabdomen pruinose, long, narrow, telescopic (Figs. 280–282). *T6* and *T7* dorsomedially weakly sclerotized, membraneous, appearing like two separated plates. *T8* long, with usual tripartite pigmentation. *T9* long, narrow, medially pale pigmented, with a pair of small dorsal setae. *S6* and *S7* simple, *S7* longer than *S6*. *S8* reduced to a typical narrow, in profile bent, T-shaped sclerite with 2 anterior arch-shaped appendages. *S9* large, broad, with some setae on posterior margin. Inside postabdomen there is an internal sclerite (Figs. 285, 286) clearly homologous with the "spectacles-shaped sclerite" of some genera but not forming the typical rings, only simple, oval plates. Spermathecae (Figs. 283, 284) oval to ball-shaped, sclerotized ducts relatively short. Cerci long and slender, each with 3 longer sinuate hairs besides some short setulae; the dorsopreapical hair strikingly thickened.

Discussion: *M. parvula* (STENHAMMAR) is very closely related to *M. trogeri* spec. nov. and probably also to *M. meszarosi* (PAPP, 1974). The first species has similar male aedeagal complex, female *T6*, *T7* and body characters (t_2 chaetotaxy, veins, pleurae, long *sc*) but differs by male *S5*, telomere, female *S8* and cerci. The latter species has similar male *S5* (cf. Fig. 3 of PAPP, 1974d) and wings but it has much smaller eye (only 1.3 times as long as the smallest genal width) and female *S8* inverse Y-shaped (taken from original description of PAPP, 1974d). The thickened dorsopreapical hair on female cercus is somewhat similar to that of *M. parafungicola* (PAPP, 1974). Unfortunately, more precise evaluation of PAPP's (1974d) species is impossible owing to their very brief and superficial descriptions.

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Apparently *M. parvula* (STENHAMMAR) has been confused with *M. fungicola* (HALIDAY) by previous authors (see e.g. the photograph of the wing in DUDA, 1918, Fig. 29). Also PAPP's (1973c) illustration of the wing of *M. fungicola* is that of *M. parvula*, although he later (PAPP, 1974d, Fig. 4) figured the male *S5* of the true *M. fungicola* (HALIDAY). DUDA (1918), followed by subsequent authors, considered *M. parvula* (STENHAMMAR) to be species dubia and in fact the species is not recognizable from the original description, but the examination of the preserved type material made its identity with the above described species apparent (ROHÁČEK, 1981).

Biology: The species seems to be associated with decaying fungi. I have found in mainly on decayed *Russula* spec., *Lactarius* spec., *Amanita* spp., *Phallus impudicus*, *Pleurotus ostreatus* etc., much more rarely (five times) on carrion, excrement (especially in spring), decaying vegetation and on house windows. Adults occur during the whole vegetation period (II—XI) but most frequently in early autumn. Some previously published records of *M. fungicola* (especially the breeding records from fungi — e.g. PAPP, 1979b) might refer to this species but revision of the documentary material is necessary.

Distribution: Only records based on material examined are presented — GB: England, Scotland; Poland, Czechoslovakia, Bulgaria, Denmark, Sweden, Finland. Probably widespread in Europe.

Subgenus ***Allolimosina*** **subgen. nov.**

Type species: *Limosina* (*Scotophilella*) *albinervis* DUDA, 1918

Diagnosis: The subgenus is defined by the following set of characters.

(1) *pvt* always developed
(2) 3—5 small *if*
(3) 2—6 minute *ads* inside and below *ors*
(4) *g* short or of medium length
(5) head short, carina strongly protruding between antennae
(6) 2 *hu*, the internal reduced to a microseta
(7) 1 *dc* in prescutellar position
(8) 6 rows of *ac* hairs in front of suture
(9) 2 *stpl*, the anterior small
(10) mesopleuron and sternopleuron pruinose, with shining spots
(11) scutellum roundly triangular
(12) t_2 chaetotaxy (Figs. 287, 288), ventrally with only *va*
(13) *C* distinctly overpassing R_{4+5}
(14) Cs_2 much shorter than Cs_3 (*C*-index smaller than 0.70)
(15) R_{4+5} slightly bent up to *C*
(16) discal cell very short, with anterior outer corner always obtuse-angled, posterior outer corner acute-angled
(17) alula small, narrow, pointed
(18) *T1*+*2* shorter than *T3* and *T4* together
(19) female postabdomen long, narrow, telescopically retractile
(20) male *S5* with comb of blunt spines on posterior margin
(21) periandrium long, sparsely uniformly haired, cerci well developed
(22) telomere large but shorter than wide, flat, with various prcesses, keels and spines
(23) hypandrium very short, reduced
(24) phallophore comparatively long, epiphallus not developed
(25) distiphallus simply formed and sclerotized
(26) postgonite long, slender, with dilated apex
(27) ejaculatory apodeme present, sometimes large
(28) female *T7* shortened dorsomedially, *T8* with tripartite pigmentation, long
(29) female *T9* long, narrow, with 2 dorsal setulae

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(30) female *S8* strongly reduced to a minute plate situated closely to *S7* or wholly absent
(31) female *S9* large, with medial anterior incision
(32) an internal sclerite inside postabdomen present in some species
(33) spermathecae vesiculate, oval, egg-shaped to cylindrical
(34) female cerci long, slender, each with 3 longer sinuate and 1—2 shorter curved hairs.

Discussion: The subgenus *Allolimosina* subgen. nov. is characterized by a number of autapomorphic features (very short Cs_2, shortened discal cell with acute posterior corner, strongly reduced hypandrium, reduced or wholly extinct female *S8*, female *S9* with anterior incision) but its close relationship to *Minilimosina* s. str. is clearly demonstrated by some (mostly synapomorphic) shared features (see discussion under *Minilimosina* s. str.). *Allolimosina* subgen. nov. seems to be the most advanced subgenus of the genus *Minilimosina*. This assertion can be confirmed by the strongly modified veins of wings, the most reduced hypandrium and female *S8* (cf. chapter "Phylogeny").

5 Palaearctic species were recognized to belong to the subgenus *Allolimosina*, 3 of which occur in Europe, viz. *M. albinervis* (DUDA, 1918), *M. alloneura* (RICHARDS, 1952) and *M. secundaria* (DUDA, 1918). Two other species were described from Mongolia by PAPP (1973a) — *M. paralbinervis* (PAPP, 1973) comb. nov. and *M. pseudoalbinervis* (PAPP, 1973) comb. nov.

Minilimosina (Allolimosina) albinervis (DUDA, 1918), **comb. nov.**

(Figs. 287—299)

Limosina (*Scotophilella*) *albinervis* DUDA, 1918: 131
Leptocera (*Scotophilella*) *albinervis*: DUDA, 1925: 158 (key)
Leptocera (*Limosina*) *albinervis*: RICHARDS, 1930: 297
Limosina (*Limosina*) *albinervis*: DUDA, 1938: 107
Leptocera albinervis: NARTSHUK, 1970: 347 (key)
Limosina albinervis: PAPP, 1973c: 52 (key)

Type material: Lectotype ♂ (des. by ROHÁČEK in 1977) labelled: "Ilfeld, S.-Harz DUDA" and "31 8 F", "*albinervis* DUDA ♂"; Paralectotypes: 2 ♂ with same data as for lectotype; 7 ♀ with same locality label but with "5 8 F", "8 8 F", "19 9 F" or "24 9 F" and "*albinervis* DUDA ♀" labels; 5 ♂ with same locality label but with "2 8 F", "11 8 F" or "26 8 F" and "*albinervis* DUDA ♂" labels (all ZMB).

Material examined (besides "Type material"): 3 ♂ 2 ♀

Spain: 1 ♂ 2 ♀ (JRO) — Tortosa env., Cullar de Baza (ROHÁČEK leg.).

FRG: 1 ♂ (ZMB) — Rheinland: St. Wendel (DUDA leg.).

Czechoslovakia: 1 ♂ (JRO) — Slovakia: Patince nr. Komárno (ROHÁČEK leg.).

Description:

Male. Total body length 0.90—1.14 mm, general colour blackish brown, relatively densely greyish brown pruinose and dull. Head short, blackish brown. Frons blackish, with anterior margin brown to yellowish brown, shining. Orbits, ocellar triangle and occiput heavily greyish dusted, dull. Interfrontalia very narrow, silvery pollinose. *pvt* well developed, as long as *occi* or *occe*. 4 short *if* of about equal length, 4—6 small *ads*. Frontal lunule brown and as facial cavity greyish dusted. Carina strongly protruding between antennae. Face and gena blackish brown and greyish brown dusted. Face in front of eye with some minute hairs; *g* distinct, of medium length. Eye rather small, its diameter about 2.0 times the narrowest genal width. Antennae brown, 3rd segment a little shorter haired than arista. Arista about 3.4 times as long as antenna, with medium long ciliation.

Thorax brownish black, heavily greyish brown pollinose (especially pleurae) and rather dull. Only 1 *dc* in prescutellar position, 6 rows of *ac* hairs in front of suture, the prescutellar medial pair of *ac* somewhat enlarged. Scutellum relatively long, roundly triangular, with robust *sc*. Pleurae with shining spot on mesopleuron and sternopleuron (Fig. 289), otherwise heavily dusted and dull. 2 *stpl*, the anterior small. Legs brown, trochanters, knees and especially tarsi pale yellowish brown. f_1 with one erect *d* bristle. t_2 chaetotaxy as in Figs. 287, 288, ventrally with only *va*. Ratio t_2: mt_2 = 1.54—1.68. Wing (Fig. 290) with whitish membrane and veins, except for the yellowish brown *C*. *C* far overpassing R_{4+5}. R_{2+3} short, containing with *C* acute angle. R_{4+5} slightly bent up to *C*. Discal cell short, with the characteristic obtuse-angled anterior outer corner; appendages of M_{1+2} and M_{3+4} short but distinct. Alula small, acute. Wing measurements: length 0.95—1.11 mm, width 0.43—0.51 mm, *C*-index = 0.52—0.63, t_a—t_p: t_p=1.25—1.67. Halteres pale, whitish yellow, knob somewhat grey dusted.

Abdomen brown, greyish brown pollinose, not shining. Terga very sparsely and shortly haired; sterna more densely but also shortly haired. *T1+2* shorter than *T3* and *T4* together. *S5* (Fig. 295) is the largest sternum and bears a medial comb of blunt spines situated on posterior darker pigmented lamella, otherwise rather sparsely haired.

Genitalia. Periandrium (Figs. 293, 294) comparatively large, long, very sparsely haired. Cerci ventrally tapering, pointed, each with 2 bristles. Hypandrium very reduced. Telomere (Fig. 292) large, flat, ventrally deeply incised and bearing some striking spines and projections (e.g. the shortly forked spine on small ventral projection). Aedeagal complex (Fig. 291) with relatively long phallophore, simple distiphallus (much shorter than that of *M. alloneura*) and long, slightly s-shaped postgonite with enlarged but pointed apex. Ejaculatory apodeme large, basally extended.

Female. Total body length 0.95—1.34 mm. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. t_2 chaetotaxy as in male but all bristles a little longer (Figs. 287, 288). Ratio t_2: mt_2 = 1.57—1.69. Wing measurements: length 1.01—1.25 mm, width 0.45—0.55 mm, *C*-index = 0.57—0.66, t_a—t_p: t_p = 1.20—1.45. Preabdomen as in male.

Postabdomen (Figs. 296—298). *T7* broadly anteriorly incised, thus dorsally very short. *T8* large, with tripartite pigmentation. *T9* long, narrow, with a pair of dorsal setulae. *S6* narrower than *S7*, both roughly oblong. *S8* still present though very reduced, short, transversely triangular. *S9* broad, its anterior incision wider than in *M. alloneura*. Spermathecae (Figs. 299) simply oval to shortly cylindrical, sclerotized parts of ducts shorter than in *M. alloneura*. Cerci long, slender, each with 3 longer sinuate hairs and 1 shorter curved one.

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Discussion: The species is related to *M. alloneura* (RICHARDS) and is distinguishable from it by the pale wing veins, longer discal cell and different shiny spot on pleurae. Further differences can be seen in the formation of the male and female terminalia. *M. pseudoalbinervis* (PAPP, 1973) from Mongolia also seems to be a closely allied species which, however, differs from *M. albinervis* by dark brown veins, dark halteres, 5 *if*, dark anterior margin of frons etc. *M. pseudoalbinervis* was described from a single female (PAPP, 1973a) so its terminalia are unknown and are unavailable to elucidate the degree of its affinity to *M. albinervis*.

M. albinervis appears to be a rather primitive member of the subgenus *Allolimosina* having retained (though very reduced) the female *S8*.

Biology: The species occurs rarely on compost heaps and house windows (DUDA, 1938). PAPP (1975a) recorded it from manure. I have collected it on decaying vegetation on dump heaps and on rabbit dung. DUDA (1918) reports large number of this species (altogether 150 specimens) on house windows. Adults were found in V—IX (combined data of above authors and material examined).

Distribution: The species is probably widespread in the Palaearctic, but its distribution is insufficiently known: Spain (material examined, new), GB: England (RICHARDS, 1930, 1976), GDR (DUDA, 1918, 1938), Czechoslovakia (ROHÁČEK, 1978b), Hungary (PAPP, 1975a), Palestine (DUDA, 1938), Afghanistan (PAPP, 1978a). VANSCHUYTBROECK's (1943a) record from Belgium belongs to a different species of the subgenus *Minilimosina* s. str.

Minilimosina (Allolimosina) alloneura (RICHARDS, 1952), **comb. nov.**

(Figs. 300—309, 312)

Leptocera (Limosina) alloneura RICHARDS, 1952: 90

Type material: Holotype ♂ labelled: "Hall b. Admont, an Köder in Mauselöchern, lg. H. FRANZ", "Right wing on slide", "*Leptocera alloneura* ♂ RICH. Type", "Pres by Com Inst Ent B M 1953—357" and "Type" (on circular label with red margin); allotype ♀ with same labels as holotype but with "*Leptocera alloneura* ♀ RICH. Allotype"; paratype ♂ with same labels as holotype but with "*Limosina* n. spec. aff. *heteroneura* det. H. FRANZ", "*Leptocera alloneura* ♂ RICH. Paratype" and Para-type" (on circular label with yellow margin), all in BML (examined). Location of remaining paratypes (1 ♂ 1 ♀) unknown to me.

Material examined (besides "Type material"): 1 ♂ 1 ♀

Czechoslovakia: 1 ♂ 1 ♀ (JRO) — Moravia: Lednice (Vaňhara leg.); Slovakia: Blatné Remety-Senné (Beneš leg.).

Description:

Male. Total body length 0.82—1.03 mm, general colour brownish black. Head black, dull. Frons with brown, narrow anterior margin, otherwise black, greyish black dusted and dull, only a narrow frontal triangle subshining. Interfrontalia hardly discernible. 3—4 *if* of equal length, 2—4 very minute *ads*; *pvt* present but very minute contrary to those of *M. albinervis*. Frontal lunule brown dusted. Facial cavity blackish brown, subshining; carina strongly protruding between antennae. Gena and face blackish brown and dusted, dull. *g* distinctly developed. Eye relatively small, its longest diameter about 2.0 times the smallest genal width. Antennae brownish black, 3rd segment comparatively long pilose. Arista about 3.5 times as long as antenna, rather long ciliate.

Thorax brownish black, greyish brown pollinose, a little shining. Mesonotal chaetotaxy as usual: 1 short prescutellar *dc*, 6 rows of *ac* hairs in front of suture, the medial prescutellar *ac* pair enlarged. Pleurae heavily pollinose, dull, except for the shining spots on mesopleuron and sternopleuron (Fig. 312). 2 *stpl*, the anterior small. Scutellum rounded triangular, with comparatively robust *sc*. Legs brown, trochanters, knees and tarsi paler. t_2 chaetotaxy as in *M. albinervis* (cf. Figs. 287, 288). Ratio $t_2 : mt_2 = 1.78—1.96$. Wing (Fig. 300) with very pale brownish to hyaline membrane, veins pale brown, *C* blackish brown. *C* distinctly extended beyond R_{4+5}. R_{2+3} and R_{4+5} very slightly bent up to *C*. R_{2+3} connected with *C* in acute angle. Discal cell very short, its anterior outer corner obtuse-angled; appendages of M_{1+2} and M_{3+4} short, the first continued by colourless fold. Alula small, narrow, acute. Wing measurements: length 0.79—0.96 mm, width 0.41—0.46 mm, *C*-index = 0.53—0.56, $t_a—t_p : t_p = 0.48—0.60$. Halteres blackish brown, with yellowish brown stem.

Abdomen brownish black, pollinose, very little shining. Terga sparsely and very shortly haired, sterna with somewhat longer and denser pilosity. *T1+2* shorter than *T3* and *T4* together, about 1.7 times as long as *T3*. *S5* (Fig. 305) relatively simple, sparsely haired, with a medial comb of blunt spines on posterior margin composed of less numerous spines than that of *M. albinervis*.

Genitalia. Periandrium (Figs. 303, 304) relatively large and long, very sparsely haired. Cerci large, each ventrally with small pointed process and some hairs. Hypandrium very short. Telomere (Fig. 302) peculiarly formed, flat but with a number of processes, keels and incisions externally as well as internally. The most striking is a strange forked spine arising on inner side of anteroventral projection and the densely haired area on the same projection. Aedeagal complex (Fig. 301) relatively simple, with rather long phallophore and slender, weakly sclerotized and apically dorsally curved distiphallus. Postgonite strongly curved preapically; its flattened and blunt apex with 3 external minute setulae. Ejaculatory apodeme very small.

Female. Similar to male except for difference mentioned below. Total body length 0.98—1.11 mm. t_2 with slightly longer bristles. Ratio $t_2 : mt_2 = 1.87—1.89$. Wing measurements: length 0.90—0,96 mm, width 0.44—0.46 mm, *C*-index = 0.50 to 0.52, $t_a—t_p : t_p = 0.60$.

Postabdomen (Figs. 306—308). *T6* and *T7* dorsomedially shortened, i.e. anteriorly broadly incised. *T8* long, with tripartite pigmentation; *T9* narrow, long, medially pale pigmented, dorsally with a pair of small setulae. *S6* unmodified, *S7* long, its posterior margin membraneous. *S8* completely absent. *S9* large, broad, with deep anterior incision. Behind *S9*, below bases of cerci, is an additional minute sclerite. Inside postabdomen, between 7th and 8th segment there is an internal sclerite, apparently homologous with the „spectacles-sheped" sclerite of more advanced genera. Spermathecae (Fig. 309) vesiculate, with impressed tips and medium long sclerotized parts of ducts. Cerci slender, each with 3 longer sinuate hairs and 2 shorter curved ones.

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Discussion: The species is closely allied to *M. albinervis* (DUDA) but is easily separable from it by very short discal cell ($t_a - t_p$ shorter than t_p), dark wing venation, different pruinose pattern on pleurae and by a great many features of the male genitalia (cerci, telomere, postgonite, distiphallus, ejaculatory apodeme) and female postabdomen (absence of *S8*, larger *S9*, spermathecae with longer ducts).

The nearest Palaearctic relative of *M. alloneura* (RICHARDS) is undoubtedly *M. paralbinervis* (PAPP, 1973) from Mongolia and Afghanistan which might even be conspecific with it (PAPP, 1973a, not knowing *M. alloneura*, compared his species with *M. albinervis*) as no distinguishing feature was found in the original description (PAPP, 1973a: 402).

Biology: A very little known species. All type specimens were caught on bait in mouse-holes (RICHARDS, 1952b). I have examined 1 ♀ obtained from forest litter by means of TULLGREN's apparatus and 1 ♂ collected on hare carrion. The known collecting dates are from V and VIII.

Distribution: Austria (RICHARDS, 1952b), Czechoslovakia (ROHÁČEK, 1978b).

Minilimosina (Allolimosina) secundaria (DUDA, 1918), **comb. nov.**

(Figs. 310, 311, 313–317)

Limosina (Scotophilella) secundaria DUDA, 1918: 133
Leptocera (Scotophilella) secundaria: DUDA, 1925: 158 (key)
Leptocera (Limosina) secundaria: RICHARDS, 1930: 298
Limosina (Limosina) secundaria: DUDA, 1938: 145
Leptocera secundaria: NARTSHUK, 1970: 348 (key)
Limosina secundaria: PAPP, 1973c: 52 (key)

Type material: Holotype ♀ labelled: "Ilfeld, S.-Harz DUDA", "13 9 15" and "*secundaria* m. det. DUDA" (ZMB, examined).

Material examined (besides "Type material"): 1 ♀

GB: 1 ♀ (UMO) – England: Cambs: Wood Ditton Wood (COLLIN leg.).

Description:

Male unknown. Female. Total body length 1.19–1.23 mm, general colour brownish black, rather shining. Head brownish black, subshining. Frons blackish brown dusted, with reddish brown anterior margin. Frontal triangle narrow, long, subshining. Orbits and ocellar triangle more shining. 4 small *if* of equal length; *pvt* well developed, 4 small *ads* inside and below *ors*. Carina strongly protruding between antennae, facial cavity blackish and shining. *g* distinct. Face and gena blackish brown, greyish brown dusted. Eye not very large, its diameter 2.3 times the smallest genal width. Antennae black, 3rd segment medium long ciliate as is also arista. Arista about 3.2 times as long as antenna.

Thorax blackish brown, pruinose but rather shining. Mesonotum sparsely pruinose, more shining. 1 *dc* in prescutellar position, 6 rows of *ac* microsetae in front of suture. Pleurae more densely pruinose, dull, but mesopleuron and sternopleuron with shining spot (Fig. 311). Scutellum rounded trapezoidal, with usual 4 *sc*. Legs blackish brown, only trochanters and knees a little paler. f_1 with 1 erect dorsal bristle as in *M. albinervis*. t_2 chaetotaxy (Fig. 310) similar to that of *M. albinervis*, ventrally with only *va*. Ratio $t_2 : mt_2 = 1.84–1.91$. Wing (Fig. 313) hyaline, veins pale brown, *C* dark brown and far overpassing R_{4+5}. R_{2+3} apically strongly curved and connecting with *C* in much greater angle than that of *M. albinervis*. R_{4+5} slightly bent to *C*. Discal cell short, its anterior outer corner obtuse-angled; pigmented processes of M_{1+2} and M_{3+4} beyond t_p short but that of M_{1+2} continued by colourless fold. Alula small, very narrow. Wing measurements: length 1.09 to 1.30 mm, width 0.57–0.63 mm, *C*-index = 0.32–0.50, $t_a - t_p : t_p = 1.20–1.38$. Halteres blackish brown, stem brown. Abdomen brownish black, subshining. Terga very sparsely and shortly haired, sterna more densely haired. *T1+2* shorter than *T3* and *T4* together.

Postabdomen (Figs. 314–316) long, narrow, telescopically retractile. *T7* dorsomedially shortened but not divided. *T8* long, with tripartite pigmentation, *T9* long, narrow, with a pair of small dorsal setulae. *S6* normal, transversely oblong, *S7* prolonged and tapering posteriorly, medially on posterior margin finely pubescent. *S8* absent (the prolonged medial posterior part of *S7* is possibly a relic of *S8* fused with *S7*); *S9* large, long but narrow compared with that of related species, anteriorly with medial deep and narrow incision. Behind *S9* there is a minute, sickle-shaped sclerite (= ? secondary sclerotization around anus). Spermathecae (Figs. 317) with sclerotized ducts of medium length, simply egg-shaped. Cerci very long and slender, each with 3 long sinuate hairs and 2 short, curved hair-like setulae.

Discussion: The species is an easily recognizable representative of *Minilimosina*, especially by its characteristically curved R_{2+3} and very low *C*-index, besides the peculiarly pruinose pleurae and formation of female *S7* and *S9*. The male of *M. secundaria* (DUDA) is hitherto unknown but its relationship to *M. albinervis* (DUDA) and *M. alloneura* (RICHARDS) is apparent and therefore also its placement into subgenus *Allolimosina* is beyond doubts.

Biology: The species is extremely rare. Only 3 females were discovered up to date. DUDA (1918) caught it on a window, PAPP (1976a) by means of the soil trap on a lowland boggy meadow. Occurrence dates are in months IV–V, IX.

Distribution: GB: England (RICHARDS, 1930, 1976), GDR (DUDA, 1918) and Hungary (PAPP, 1976a).

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7. Genus *Xenolimosina* gen. nov.

Type species: *Limosina* (*Leptocera*) *setaria* VILLENEUVE, 1918

Diagnosis: The genus can be characterized as follows.

(1) *pvt* not developed
(2) 3—4 small, weak *if* of about equal length
(3) 4—5 minute *ads*
(4) *g* medium long
(5) 2 *hu*, the internal reduced to a microseta
(6) 2 *dc*, both comparatively long
(7) 6—8 rows of *ac* microsetae
(8) only 1 (posterior) rather small *stpl*
(9) mesopleuron and sternopleuron pollinose, the latter with shining spot
(10) scutellum rounded triangular *sc* long
(11) t_2 chaetotaxy (Figs. 318, 319) poor, *av* below middle always absent
(12) t_3 with dorsopreapical bristle (Fig. 332)
(13) *C* extending far beyond Rt_{4+5}
(14) Cs_2 distincly longer than Cs_3
(15) R_{4+5} slightly sinuate
(16) discal cell large and broad, both outer corners with processes of M_{1+2} and M_{3+4}
(17) alula small and pointed
(18) female postabdomen narrow, retractile into preabdomen
(19) male *S5* armed by 2 spinulate discs at posterior margin
(20) periandrium simply haired
(21) male cerci small, each with some short bristles
(22) hypandrium short, reduced
(23) telomere flat, simple in shape
(24) phallophore large, enlarged posteriorly and anteriorly with a ventral finger-like projection (pre-epiphallus)
(25) distiphallus of complex form, armed by numerous spines and thorns
(26) postgonite long and very slender
(27) ejaculatory apodeme comparatively large
(28) female *T8* with tripartite pigmentation
(29) female *T9* large, broad, with a pair of dorsal bristles
(30) female *S8* small, densely haired
(31) female *S9* large, wider than *T9* and anteriorly with 2 deep incisions
(32) spermathecae vesiculate, with very short sclerotized parts of ducts
(33) female cerci slender, long, widely separated each from other, each long sinuate haired.

Discussion: *Xenolimosina* gen. nov. belongs to the *Minilimosina* genera-group and seems to be more closely related to the genus *Minilimosina* in having similarly formed periandrium and cerci, no *av* on t_2, small alula, non-reduced phallophore and, moreover, with some characters occurring in the more progressive subgenera of *Minilimosina* (i.e. *Minilimosina* s. str., *Allolimosina*) — these include the flat telomere and reduced hypandrium. The most characteristic and probably autapomorphic features of *Xenolimosina* are thought to be: phallophore with pre-epiphallus, distiphallus of complex form, peculiarly incised female *S9* and female postabdomen wider than usual (segments shorter). The large wing with sinuate R_{4+5}, broad female *T9* with widely separated cerci and t_3 with dorsopreapical bristle are also very diagnostic, although apparently plesiomorphic.

Owing to this intricate set of apomorphic and plesiomorphic features and also characters of uncertain interpretation, it is difficult to correctly place the genus *Xenolimosina* into the cladogram. One of the most probable possibilities was selected to show the supposed interrelationship within the *Minilimosina* genera-group — it is discussed in the chapter "Phylogeny" (Fig. 63).

The genus *Xenolimosina* gen. nov. is based on the type species — *X. setaria* (VILLENEUVE, 1918).

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Xenolimosina setaria (VILLENEUVE, 1918), **comb. nov.**

(Figs. 318–332)

Limosina (*Leptocera*) *setaria* VILLENEUVE, 1918a: 334
Leptocera (*Scotophilella*) *setaria*: DUDA, 1925: 159 (key)
Leptocera (*Limosina*) *setaria*: RICHARDS, 1930: 293
Limosina (*Limosina*) *setaria*: DUDA, 1938: 145
Leptocera setaria: NARTSHUK, 1970: 345 (key)
Limosina setaria: PAPP, 1973c: 51 (key)
Limosina (*Scotophilella*) *setaria* DUDA, 1918: 143

Type material:
Limosina (*Leptocera*) *setaria* VILLENEUVE: Described from specimens (number and sex not specified) collected in Berlin. Type material has not been discovered and is probably lost. However, the holotype of *L. setaria* DUDA mentioned below probably originated from the same series as the specimens of VILLENEUVE (see Discussion).
Limosina (*Scotophilella*) *setaria* DUDA: Holotype ♀ labelled: "Berlin Grunewald 21. 10. 99", "*setaria* COLLIN i. litt. sec. typ." (VILLENEUVE's handwriting on blue label), "coll. OLDENBERG" and with a black label (DEI) (examined).

Material examined (besides "Type material"): 4 ♂ 4 ♀.

GB: 3 ♂ 3 ♀ (UMO) — England: Herefordshire: Stake Wd. (WOOD leg.); Kincraig (R. H. leg.).

Belgium: 1 ♂ (IRB) — Forêt de Soignes- Boitstort (COLLART leg.).

GDR: 1 ♀ (ZMB) — Frankfurt an Od. (RIEDEL leg.).

Description:
Male. Total body length 1.47–1.79 mm. General colour dark brown, sparsely pollinose, rather shiny. Head dark brown. Frons dull but a long frontal triangle shining and orbits, narrow interfrontalia and occiput silvery grey dusted. *pvt* not developed; 3–4 relatively weak *if* of about equal length; 4–5 small *ads*. Frontal lunule paler brown, dusted and dull. Facial cavity brown, shiny; face and gena brown dusted, the latter with large triangular shiny spot below eye. *g* of medium length, thin. Eye of normal size, its diameter about 2.5 times as long as the narrowest genal width. Antennae brown, 3rd segment and arista comparatively long ciliate, the latter about 3.5 times as long as antenna.

Thorax dark brown, sparsely greyish brown pollinose, mesonotum especially shiny. Pleurae more densely dusted, duller; sternopleuron with large shining spot (Fig. 320). Mesonotal chaetotaxy as defined for the genus, i.e. 2 relatively long *dc*, 6–8 rather irregular rows of *ac* hairs between anterior *dc*. Pleurae with yellowish brown sutures between particular sclerites; only 1 (posterior) *stpl* present. Scutellum roundly triangular, *sc* relatively long. Legs dark brown, trochanters and knees paler. f_1 with a row of 3–4 strikingly long *pv* bristles. t_2 chaetotaxy (Figs. 318, 319) reduced; the dorsal bristle in apical sixth situated a little posterodorsally, true *pd* absent; *av* below middle not developed. t_3 (Fig. 332) with a long dorsal preapical seta. Ratio $t_2 : mt_2 = 1.83–1.93$. Wing (Fig. 321) large, with brownish membrane, veins brown. Cs_1 basally with a pair of bristles, one of which is distinctly longer than the second. *C* extended beyond R_{4+5}. R_{4+5} distinctly sinuate. Discal cell large, its outer corners with appendages of M_{1+2} and M_{3+4}, posterior outer corner never rounded. Alula small, narrow, pointed. Wing measurements: length 1.87–1.93 mm, width 0.83–0.90 mm, *C*-index = 1.15–1.24, $t_a–t_p : t_p = 2.05–2.20$. Halteres with dark brown knob and yellowish stem.

Abdomen brown, terga despite some pollination shining, with scarce but long, erect hairs. Sterna more densely haired and duller. *S1+2* somewhat longer haired on posterior margin; *T1+2* more than twice as long as *T3*. *S5* (Fig. 326) comparatively long densely haired, posteromedially with 2 small plates, each composed of 6 rows of short spines (more posteriorly situated rows with longer spines — Fig. 327).

Genitalia. Periandrium (Figs. 324, 325) sparsely uniformly haired. Cerci distinct but small, each with some short setae and a small posteroventral projection. Hypandrium reduced, small. Telomere (Fig. 323) flat, anteriorly and posteriorly with some longer setae and ventrally with 2 robust bristles (anterior and posterior). Aedeagal complex (Fig. 322) with large phallophore with distinctly developed pre-epiphallus and complicated distiphallus with lateral projections armed by a group of blunt spines and dorsal projection overgrown by short thorns. Postgonite slender, long, slightly s-shaped, with 2 minute setulae at anterior margin in distal third. Ejaculatory apodeme present.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.79 to 1.93 mm. t_2 as in male without *av* below middle of t_2. Ratio $t_2 : mt_2 = 1.87–1.93$. Wing longer and *C*-index higher on the average. Wing measurements: length 1.98–2.34 mm, width 0.91–1.03 mm, *C*-index = 1.32–1.52, $t_a–t_p : t_p = 1.76–2.82$.

Postabdomen (Figs. 328–330) narrow and retractile into preabdomen. All segments comparatively short. *T7* and *T8* laterally extended. *T8* with tripartite pigmentation. *T9* relatively short and broad, 2 dorsal setae long. *S6* and *S7* simple, the latter haired only laterally apart from 2 small medial setulae. *S8* reduced but rather densely haired, with a long lateral bristle on each side. *S9* very characteristic, wider than *T9* and anteriorly with 2 deep rounded incisions. Spermathecae (Fig. 331) vesiculate, with very short sclerotized parts of ducts. Cerci long, slender, widely separated from each other because of their posterolateral insertion on *T9*. Each cercus with 2 long sinuate hairs (apical and dorsopreapical) and some shorter setulae.

Discussion: The species is easily recognized by its large wings with sinuate R_{4+5}, shiny spot on sternopleuron, dorsal preapical bristle on t_3 and very peculiar male *S5* and genitalia (richly armed distiphallus, phallophore with pre-epiphallus) and female postabdomen (widely separated cerci, large and incised *S9*).

The history of discovery of this species is rather interesting. J. E. COLLIN first found this species in J. H. WOOD's collection (now in UMO and BML) and he gave it a manuscript name, *Limosina setaria* (see RICHARDS, 1930: 294) but did not describe it. J. VILLENEUVE, who apparently knew COLLIN's species and its manuscript name, discovered further specimens in the collection of OLDENBERG (now in DEI), designated them as "*setaria* COLLIN i. litt." (see "Type material") and later (VILLENEUVE, 1918a) described the species from some specimens he probably got from OLDENBERG. The remaining female in OLDENBERG's collection was subsequently (after VILLENEUVE) examined by O. DUDA who described it under the original name "*setaria* COLLIN", too (DUDA, 1918).

RICHARDS (1930: 294) refered to differences in the venation of British and German specimens but I have found them to be conspecific — the above differences are apparently due to slight sexual wing dimorphism (female has longer Cs_2).

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Biology: A series of this generally very rare species was found on decaying fungi by J. H. Wood (Richards, 1930). Besides this series only single specimens were collected. I have seen also 1 ♀ caught on a fungus (*Hypholoma fasciculare*, see also Duda, 1938) and therefore it can be presumed it is a fungivorous species. Known occurrence of adults ranges between IX—XI (combined data of Richards, 1930 and material examined).

Distribution: The species is known only from GB: England (Richards, 1930, 1976), Belgium (Duda, 1938; Vanschuytbroeck, 1942) and GDR (Villeneuve, 1918a; Duda, 1918, 1938). With respect to the extensive investigations on dipterous fauna of fungi carried out in Hungary (Papp, 1972), Czechoslovakia (by me), Finland (Hackman & Meinander, 1979) and USSR: Karelia (Papp, 1979b) during which the species has not been discovered, it is probable that *X. setaria* is really a species with a rather restricted Atlantic distribution.

8. Genus ***Paralimosina*** Papp, 1973

Paralimosina Papp, 1973a: 385
Type species: *Paralimosina kaszabi* Papp, 1973 (orig. des., mon.)

Diagnosis: The genus is defined by the following complex of characters.

(1) *pvt* small or absent
(2) 3—5 *if*
(3) 2—6 minute *ads* inside and below *ors*
(4) *g* of medium length
(5) 1 *hu* large (external), the internal reduced to a microseta
(6) 2 *dc*, rarely 1 *dc* (all postsuturals)
(7) 8—12 rows of *ac* microsetae
(8) 1—2 *stpl*, the anterior minute or absent
(9) scutellum relatively short, wide, semicircular
(10) t_2 chaetotaxy characterized by proximal group of bristles (2 *ad*, 1 *pd*), by distal group of bristles (1 *a*, 1 *ad* or *d*, 1 *pd*) and by the absence of *av* on lower half of tibia; *va* more or less reduced in male (cf. Figs. 334—337, 378—380, 405—407)
(11) *C* not overpassing R_{4+5}
(12) R_{4+5} sinuate, apically bent up to *C* (Figs. 339, 408) or apically almost straight (Fig. 381)
(13) discal cell broad, with appendages of M_{1+2} and M_{3+4}
(14) alula small, narrow, pointed
(15) female postabdomen short and not narrower than preabdomen
(16) male *S5* simple or carrying some peculiar structures
(17) periandrium uniformly shortly haired; cerci each with a long caudal hair-like bristle
(18) hypandrium of medium length, often with a ventral appendage
(19) telomere short, bilobed, its hind lobe rich in bristles
(20) phallophore compact, medium-sized (sg. *Canarisina*) or reduced (sg. *Paralimosina* s. str.)
(21) distiphallus long, compared to phallophore
(22) postgonite slender, more or less curved, with some small setulae
(23) ejaculatory apodeme usually developed (?absent in *Canarisina*)
(24) female *T7* extended laterally
(25) female *T8* divided into 2 lateral parts
(26) female *T9* short, with or without 2 dorsal setulae
(27) female *S8* long and relatively narrow
(28) female *S9* long and anteriorly incised (*Paralimosina* s. str.) or short and simple (*Canarisina*)
(29) spectacles-shaped sclerite present
(30) spermathecae vesiculate, with short or of medium length sclerotized ducts
(31) female cerci small, slender, with 2 sinuate and 1 shorter slightly curved hair.

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Discussion: The genus *Paralimosina* PAPP, 1973, differs from all related genera (*Spelobia, Pullimosina, Spinilimosina, Chaetopodella*) by its sinuate R_{4+5}, small alula, short and wide, more or less semicircular scutellum, periandrium without any longer hair or bristle, short and bilobed telomere, long female *S8*, vesiculate spermathecae and small female cerci. Some of these features appear to be autapomorphic (see cladogram in Fig. 64) and demonstrate the monophyletic origin of the genus. *Paralimosina* apparently belongs to the *Spelobia* genera-group. The most significant shared features are thought to be the numerous bristles on t_2, the wing venation which in some *Paralimosina*-species resembles that of some aberrant species of *Spelobia* s. str. (e.g. *S. nana, S. belanica* spec. nov.), the distinctly developed spectacles-shaped sclerite of the female and sinuate haired female cerci.

The seeming similarity of wing venation in some *Paralimosina* species (*P. fucata*-group) and genus *Apteromyia* and that of the *P. trichopyga*-group and the genus *Herniosina* respectively is only superficial and does not demonstrate the relationship of these genera with the genus *Paralimosina* but indicates possible presumed origin of the *Spelobia* genera-group from pre-ancestors of *Minilimosina* genera-group (see the chapter "Phylogeny").

The identity of the genus *Paralimosina* has not previously been recognized (ROHÁČEK, 1977a) due to its inadequate description, based on only four females. PAPP (1973a) describing the new genus and species *Paralimosina kaszabi* also did not recognize its near relationship with the *Limosina fucata*-group (probably because of his ignorance of *L. trichopyga* RICHARDS) and compared it with *Limosina silvatica* (MEIGEN) which is not a more closely allied species, belonging to a different genera-group. Recently I examined 2 ♀ paratypes (TMB) of *P. kaszabi* and found it to be conspecific with *Limosina latigena* ROHÁČEK, 1977, of the *Limosina fucata* species-group (sensu ROHÁČEK, 1977a). As this species group represents a distinct genus, *Paralimosina* PAPP, 1973, must be used as its generic name.

The genus *Paralimosina* includes 7 species in the Palaearctic Region, one of which, *P. beckeri* (DUDA, 1918), is very aberrant. A new subgenus *Canarisina* subgen. nov. is erected for this species; the remaining 6 species are placed in the subgenus *Paralimosina* s. str. 5 species of the latter subgenus occur in Europe — *P. fucata* (RONDANI, 1880), *P. subcribrata* (ROHÁČEK, 1977), *P. macedonica* (ROHÁČEK, 1977), *P. trichopyga* (RICHARDS, 1952) and *P. kaszabi* PAPP, 1973. *P.* (*Paralimosina*) *altimontana* (ROHÁČEK, 1977) comb. nov. is known only from Nepal. *Limosina rohaceki* PAPP, 1978, from Afghanistan does not appear to belong to the genus *Paralimosina*, although PAPP (1978a) placed it near to *P. altimontana*, because its *C* extends beyond R_{4+5} and it differs in the chaetotaxy of t_2 (structures of the male and female terminalia unknown)[7]. On the other hand, the North American *Paralimosina levigena* (SPULER, 1925) comb. nov. is apparently a *Paralimosina* s. str. most probably belonging to the *P. trichopyga*-group.

Key to the European subgenera and species

1 Frons without velvety black M-shaped mark, male *S5* with some peculiar structures (Fig. 411), hypandrium without ventral appendage, telomere ventrally with robust, short spines (Fig. 410), phallophore not reduced and distiphallus spinulate (Fig. 409), female *S9* short and simple (*Canarisina* subgen. nov.) — R_{4+5} strongly curved up to *C* (Fig. 408), the middle pair of *if* very long, crossing; abdomen strikingly shining and glabrous, female postabdomen (Figs. 414—416) . . . . . *P.* (*C.*) *beckeri* (DUDA)

— Frons with velvety black M-shaped mark (Fig. 333), the middle pair of *if* shorter, not crossing, male *S5* simple, hypandrium with ventral bifurcate appendage (Figs. 342, 397), telomere without ventral robust and short spines, phallophore reduced, kidney to sickle-shaped, distiphallus not spinulate, female *S9* anteriorly incised (*Paralimosina* s. str.) 2

2(1) Wing short and broad, R_{4+5} apically curved up to *C* (Figs. 339, 352, 364), male mid tibia with distinct *va* (Fig. 336) 3

— Wing longer and narrower, R_{4+5} apically almost straight (Figs. 381, 393), male t_2 ventrally with a row of short spines, the most apical of which is a reduced *va* (Fig. 379) 5

[7] Recently I have examined the holotype of this species in TMB and recognized its generic placement. It is *Minilimosina* (s. str.) *rohaceki* (PAPP, 1978), comb. nov.

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3(2) Wing membrane milky, veins strikingly pale; male postgonite strongly curved (Fig. 365), male *S5* with additional posterior sclerite (Fig. 367); female postabdomen (Figs. 370—372) . . . . . *P.* (*P.*) *macedonica* (ROHÁČEK)

— Wing membrane yellowish brown, veins dark; male postgonite slightly curved, male *S5* simple, female postabdomen different 4

4(3) Frons orange to reddish anteriorly, also face and gena partly brick-red, 2 *dc*, abdomen glabrous and shiny. Telomere (Fig. 341) with 3 robust spikes on posterior lobe and small point on anterior lobe, postgonite apically pointed (Fig. 340). Spermathecae (Fig. 349) . . . . . *P.* (*P.*) *fucata* (RONDANI)

— Frons, face and gena black, only 1 *dc*, abdomen and thorax densely and strongly punctate. Telomere (Fig. 354) with simply haired posterior lobe and anteriorly incised anterior lobe, postgonite (Fig. 353) apically enlarged and rounded. Spermathecae (Fig. 361) . . . . . *P.* (*P.*) *subcribrata* (ROHÁČEK)

5(2) Eye large and convex (Fig. 377), its diameter nearly 3 times the genal width, abdominal terga with transverse microsculpture, not glabrous, dusted. mt_2 with enlarged *v* seta (Fig. 379), better developed in male. Telomere (Fig. 383) with a fan of numerous, long, curved bristles on posterior lobe, postgonite with simple apex (Fig. 382). Spermathecae (Fig. 390) . . . . *P.* (*P.*) *trichopyga* (RICHARDS)

— Eye reduced, flat, its diameter smaller than genal width (Fig. 381), abdominal terga only finely punctate and almost glabrous, shiny. No enlarged *v* seta on mt_2. Telomere different (Fig. 395), postgonite apically button-like enlarged (Fig. 394). Spermathecae (Fig. 402) . . . . . *P.* (*P.*) *kaszabi* PAPP

Subgenus ***Paralimosina*** s. str.

Paralimosina PAPP, 1973a: 385 (as genus)
Type species: *Paralimosina kaszabi* PAPP, 1973

Limosina fucata-group: ROHÁČEK, 1977a: 399

Diagnosis: The subgenus is characterized by the following complex of features.

(1) *pvt* small, rarely absent (*P. subcribrata*)
(2) 3—5 *if*, of which 2—3 posterior strong
(3) 2—6 minute *ads* inside and below *ors*
(4) *g* of medium length
(5) frons with velvety black M-shaped mark
(6) 2 *hu*, the internal minute
(7) 2 *dc*, rarely only 1 *dc*
(8) 8—12 rows of *ac* hairs in front of suture
(9) 2 *stpl*, the anterior minute, the posterior strong
(10) scutellum relatively short, semicircular
(11) f_1 and f_3 of male more or less thickened
(12) t_2 chaetotaxy as in Figs. 334—337, 378—380, ventrally always without *av* below middle of t_2
(13) *C* not extending beyond R_{4+5}
(14) R_{4+5} sinuate, its apical part either curved up to *C* (Fig. 339 — *P. fucata*-group) or almost straight (Fig. 381 — *P. trichopyga*-group)
(15) discal cell short, broad, usually with appendages of M_{1+2} and M_{3+4}
(16) alula small, narrow, pointed
(17) female postabdomen short but not essentially narrower than preabdomen
(18) male *S5* simple, without prominent structures, at most with some cuticular structures in membrane behind it
(19) periandrium uniformly shortly haired; each of reduced cerci carrying a long caudal hair-like bristle
(20) hypandrium with ventral bifurcate appendage
(21) telomere bilobed, very low, its fore lobe almost bare, hind lobe usually darker and characteristically haired

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(22) phallophore very short, in profile kidney to sickle-shaped, epiphallus not developed
(23) distiphallus long, of complex form, with various processes
(24) postgonite slender and more or less curved
(25) ejaculatory apodeme always present
(26) female *T7* extended laterally
(27) female *T8* divided into 2 lateral sclerites
(28) female *T9* short, with or without 2 dorsal setae
(29) female *S8* long, narrow, tapering posteriorly
(30) female *S9* relatively long, with a deep anterior incision of various shape
(31) spectacles-shaped sclerite well developed
(32) spermathecae vesiculate, with short sclerotized ducts
(33) female cerci short, slender, with 2 sinuate and 1 shorter slightly curved hair.

Discussion: The subgenus *Paralimosina* s. str. has already been characterized (as *L. fucata* species-group) by ROHÁČEK (1977a). The most diagnostic features are as follows: velvety black M-shaped mark on frons, the ventral appendage of hypandrium, bilobed and short telomere without robust ventral spines, very short phallophore, distiphallus not spinulate, long and posteriorly tapering female *S8* and anteriorly incised female *S9*. The simple male *S5* is also very characteristic.

The subgenus *Paralimosina* s. str. appears to be homogeneous and distinctly separated from the subgenus *Canarisina* by the above characters. While the subgenus *Canarisina* is rather intermediate between *Paralimosina* s. str. and *Spelobia*, the subgenus *Paralimosina* s. str. and especially its *P. trichopyga*-group seems to represent the most archaic group among the genera and subgenera related to the subgenus *Spelobia* s. str. (see the chapter "Phylogeny").

The subgenus includes 6 Palaearctic and 1 Nearctic species — they are fully enumerated in the discussion under the genus *Paralimosina* (p. 50).

Paralimosina (Paralimosina) fucata (RONDANI, 1880), **comb. nov.**

(Figs. 333–336, 339–351)

Limosina fucata RONDANI, 1880: 31; PAPP, 1973c: 44 (key); ROHÁČEK, 1977a: 401
Leptocera (*Scotophilella*) *fucata*: DUDA, 1925: 159 (key) (part.)
Limosina (*Limosina*) *fucata*: DUDA, 1938: 134 (part.)
Leptocera (*Limosina*) ? *fucata*: DEEMING, 1969: 67 (Fig. 26)
Leptocera fucata: NARTSHUK, 1970: 348 (key)
Limosina (*Scotophilella*) *verticella*: DUDA, 1918: 148 (part.) nec STENHAMMAR, 1854
Leptocera verticella: SÉGUY, 1934: 471
Limosina verticella: COLLIN, 1956: 173

Type material: Holotype ♂ labelled: "1943" (= a catalogue No. — red numeral on oval label), deposited in MSF (examined). This specimen has been collected by A. COSTA at Partenope (RONDANI, 1880).

Material examined (besides "Type material"): 42 ♂ 30 ♀

Spain: 13 ♂ 10 ♀ (JRO) — Salou nr. Tarragona (ROHÁČEK leg.).

GB: 1 ♂ (UMO) — England: Suffolk: Barton Mills (COLLIN leg.).

Belgium: 1 ♀ (IRB) — Bruxelles (COUCKE leg.).

FRG: 3 ♂ 1 ♀ (ZMB) — Rheinland: St. Wendel (DUDA leg.); Westfalen: Herten (DUDA leg.).

GDR: 1 ♀ (ZMB) — Frankfurt an Od. (RIEDEL leg.).

Denmark: 1 ♂ (ZMK) — NEZ: Hareskov (OVERGAARD leg.).

Poland: 2 ♂ 1 ♀ (ZMB) — Wustung b. Habelschwerdt (DUDA leg.), Panten nr. Legnica (BECKER leg.).

Czechoslovakia: 18 ♂ 15 ♀ (JRO, SMO, MHK) — Bohemia: Choltice, Hor. Jelení, Opočno, Uhersko (MOCEK leg.); Moravia: Úvalenské louky (distr. Opava) (ROHÁČEK leg.) and localities given by ROHÁČEK (1977a); Slovakia: see ROHÁČEK (1977a).

Bulgaria: 3 ♂ 1♀ (IZS) — Vrotzansko-Han Matnica, Camping Perla, Pirdop, Stamopolo (BESHOVSKI leg.).

Tunisia: 1 ♂ (ZMB) — Ain Dranam (BECKER leg.).

Description:

Male. Total body length 1.94–2.46 mm, general colour black, dusted brown but rather shiny. Head blackish brown, frons black with silvery shiny narrow frontal triangle and interfrontalia. Also orbits and occiput silvery shining. Between interfrontalia and frontal triangle, and also inside silver orbits, velvety black stripes connected in M-shaped mark (Fig. 333). Front of frons orange or brick-red, also face and anterior part of gena reddish. Frontal lunule grey dusted, facial cavity blackish brown, shiny. *pvt* minute; 3 (very rarely 4) *if*, the most anterior minute; 3–5 small *ads*; *g* of medium length. Eye diameter about 2.3 times the smallest genal width. Antennae brownish black. Arista 2.6 times as long as the antenna, with relatively short pubescence.

Thorax black, pleurae densely brownish dusted, mesonotum and scutellum rather shiny, sparsely pollinose, 2 *dc*, about 8 rows of *ac* hairs, 2 *stpl*. Sutures between pleural sclerites yellowish. Scutellum semicircular, somewhat longer than half of its basal width. Legs blackish brown, trochanters, knees and tarsi yellowish brown. f_1 and f_3 somewhat thickened, t_3 slightly curved. Chaetotaxy of t_2 as in Fig. 336, ventrally with a short *va*. Ratio t_2: mt_2 = 1.65–1.90. Wing (Fig. 339) with

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light brownish membrane, veins brown. *C* not produced beyond R_{4+5}; R_{4+5} sinuate, basally straighter, apically distinctly bent up to *C* and ending a little nearer the apex of wing than unpigmented part of M_{1+2}. Discal cell short, broad. Both processes of M_{1+2} and M_{3+4} short. Alula small, narrow. Wing measurements: length 1.67–2.14 mm, width 0.71–1.03 mm, *C*-index= 0.97–1.36, $t_a - t_p : t_p = 1.55-2.12$. Halteres yellow.

Abdomen black, terga shiny, almost glabrous, very finely punctate and with exception of *T1+2* not dusted. Terga very sparsely haired, especially medially; sterna shortly haired on the entire surface. *S5* (Fig. 344) simple, without characteristic structures, with only shallow medial emargination on posterior margin.

Genitalia. Periandrium (Figs. 342, 343) ball-shaped, with a projection on the right side of anterior margin, uniformly short haired. Cerci small, reduced, with a long caudal hair each. Hypandrium with a ventral appendage similar to the other species of the subgenus. Telomere (Fig. 341) consisting of 2 lobes; the anterior lobe flat, pale, with a small point on the anterior margin, the posterior lobe dark, with numerous bristles 3 of which are modified to very stout spines. Aedeagal complex (Fig. 340). Phallophore very short, crescent-shaped. Distiphallus of complex form, with a dorsal projection. Postgonite slender, slightly bent, apically pointed, with about 4 hair-like microsetae on the anterior margin. Ejaculatory apodeme small but distinct.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.91 to 2.38 mm. f_1 and f_3 not thickened. t_2 with much longer *va* (Fig. 335) and somewhat longer bristles on dorsal side (Fig. 334). Ratio $t_2 : mt_2 = 1.54-1.75$. Wing measurements: length 1.75–2.18 mm, width 0.79–1.03 mm, *C*-index = 1.02–1.27, $t_a - t_p : t_p = 1.60-2.00$.

Postabdomen (Figs. 345–347). *T7* short, transversely band-shaped, laterally extended. *T8* divided into two lateral plates. *T9* as long as wide, without any hairs or bristles. *S7* normal, *S8* typical for the subgenus, narrow, long, with a pair of long ventral bristles. *S9* with deep and in comparison with related species a broad anterior incision (see caudal view – Fig. 348), posterior part finely pubescent. Inside the postabdomen, on the level of 7th–8th segment, there is a spectacles-shaped sclerite connected with spermathecae by spermathecal ducts (Figs. 350, 351). This sclerite rather weakly sclerotized, membraneous, but distinctly developed. Spermathecae (Fig. 349) vesiculate, globular, with short sclerotized ducts. Cerci small, slender, each with 2 long sinuate hairs and some shorter hairs.

Discussion: *P. fucata* (RONDANI), *P. macedonica* (ROHÁČEK) and *P. subcribrata* (ROHÁČEK) constitute a separate species-group characterized by the apically upcurving R_{4+5}, male t_2 with distinct *va* and relatively short *S9* of the female. However, this species-group seems to be less homogeneous than that of *P. trichopyga* (RICHARDS) (see below), judging from the differences between the relevant taxa (ROHÁČEK, 1977a). *P. fucata* differs considerably from the allied species by reddish colour on frons, face and gena, strikingly glabrous and shiny abdominal terga and, above all, by the characteristic male telomere and aedeagal complex.

The identity and synonymies of this species have been correctly interpreted by me (ROHÁČEK, 1977a) although I had not examined the type specimen of *P. fucata* (RONDANI). The male holotype has now been discovered and its examination confirmed my previous interpretation. On the other hand, STENHAMMAR's (1854) species, viz. *Limosina verticella* STENHAMMAR and *L. nitens* STENHAMMAR, both possibly belonging to *Paralimosina*, must be considered as "species dubiae" as they are apparently not identical with any known species of this group (cf. ROHÁČEK, 1977a) and the type material is lost (KIM, 1972).

Biology: The first critical data based on revised material are given by ROHÁČEK (1977a). The species was found always in woodlands, usually on various excrement (fox, roe, sheep, mouflon and human) but also on decayed fungi (*Russula* spec., *Phallus impudicus*), in forest litter and incidentally on carrion. Adults occur obviously during the whole vegetation period (recorded from II–X) and are generally uncommon.

Distribution: Widespread throughout Europe and North Africa. The verified records are from Spain (material examined, new), GB: England (COLLIN, 1956; RICHARDS, 1976; ROHÁČEK, 1977a), Belgium, FRG, GDR, Poland, Czechoslovakia (ROHÁČEK, 1977a), Denmark (material examined, new), Hungary (PAPP, 1973c), Bulgaria (material examined, new), Italy (RONDANI, 1880; DEEMING, 1969), Tunisia (ROHÁČEK, 1977a).

Paralimosina (Paralimosina) subcribrata (ROHÁČEK, 1977), **comb. nov.**

(Figs. 338, 352–363)

Limosina subcribrata ROHÁČEK, 1977a: 407

Type material: Holotype ♂: Czechoslovakia, Moravia, Brno-Soběšice, 25. 7. 1973, burrow of vole in oak forest, J. ROHÁČEK leg. Paratype ♂: Czechoslovakia, Moravia, Lednice, 1. 9. 1971, sweeping over *Deschampsia caespitosa* in a lowland forest, IBP leg. (preserved in alcohol) (JRO, examined).

Material examined (besides "Type material"): 9 ♀

Czechoslovakia: 8 ♀ (JRO, SMO, MHK) – Bohemia: Choltice (MOCEK leg.); Moravia: Dol. Bušínov, Nýdek (ROHÁČEK leg.).

Austria: 1 ♀ (NMA) – Steiermark: Admont (STROBL leg.).

Description:

Male. Total body length 1.75–1.80 mm, general colour black, shiny. Head black. Frons fully black, orbits and frontal triangle silvery shiny, interfrontalia rather indistinct. Frons with velvety blackish M-shaped mark. Anterior frontal margin blackish pollinose, dull. *pvt* not visible. 3 *if*, the most anterior three times shorter than the others, *g* rather short. Facial cavity black, its margins and keel pollinose, rest shiny. Frontal lunule greyish pollinose, face and gena black, partly pruinose. Gena somewhat wider than half of the largest eye-diameter. Arista about 3.2 times longer than antenna and moderately long ciliate.

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Thorax black, mesonotum shiny, sparsely pollinose, distinctly and densely punctate. Only 1 *dc* in prescutellar position. 8 rows of *ac* hairs in front of suture. Scutellum densely wrinkled and punctate, much wider than long. Pleurae black, dull, granulate and dusted. Legs black, only trochanters, knees and tarsi light brown. f_1 and f_3 somewhat thickened. t_2 chaetotaxy as in Fig. 338, ventrally only with *va*. All bristles of t_2 generally shorter than those of the related species. Ratio $t_2 : mt_2 = 1.75-1.91$. Wing (Fig. 352) rather small, yellowish brown, veins darker brown. *C* not produced beyond R_{4+5}. R_{4+5} sinuate, apically curved up to *C*. Discal cell short, both pigmented processes of M_{1+2} and M_{3+4} beyond t_p well developed. Alula small, narrow. Wing measurements: length 1.44–1.46 mm, width 0.64–0.65 mm, *C*-index = 1.07–1.12, $t_a-t_p : t_p = 1.67-1.75$. Halteres yellow with darker knob.

Abdomen black, shining, strongly sclerotized. Terga, especially their margins, densely rasp-like punctate, almost as strongly as in *Puncticorpus* species. Sterna with transversely wrinkled microsculpture, sparsely haired. *S5* plain and simply haired (Fig. 355).

Genitalia. Periandrium (Figs. 356, 357) rather small, uniformly shortly haired. Cerci small, each with a relatively short caudal hair. Hypandrium short, with strongly sclerotized ventral bifurcate process. Telomere (Fig. 354) bilobed, its anterior lobe paler, with incision on fore margin, posterior lobe darker and longer haired, internally with a strong, inwards directed spine (see Fig. 357). Aedeagal complex (Fig. 353) with short phallophore and larger distiphallus. Postgonite apically somewhat enlarged, with 2 minute hair-like setulae in half of anterior margin and with some small tubercles subapically. Ejaculatory apodeme small.

Female (femina nova). Head, thorax, legs and preabdomen as in the male unless mentioned otherwise. Total body length 1.78–2.13 mm. f_1 and f_3 not thickened. t_2 with distinctly longer *va*. Ratio $t_2 : mt_2 = 1.70-1.79$. Wing measurements: length 1.38–1.72 mm, width 0.61–0.75 mm, *C*-index = 0.88–1.23, $t_a-t_p : t_p = 1.57-2.23$. Preabdomen strongly punctate as in male.

Postabdomen (Figs. 358–360) short and strongly contracted in natural position. *T7* transverse, extended laterally. *T8* divided into 2 rather large lateral plates. *T9* short, transverse, with a pair of very fine dorsal hairs. *T6*, *T7*, *S6* and *S7* very shortly and sparsely haired. *S8* large but relatively wider than that of related species, with a pair of long ventral hairs. *S9* with a deep anterior incision and distinctly pubescent posterior part. Spectacles-shaped sclerite (Figs. 362, 363) relatively large but weakly sclerotized except for the small dark pigmented ventral sclerite. Spermathecae (Fig. 361) of very distinctive form (Fig. 361), with short, somewhat thickened ducts inserted subbasally. Cerci small, each with a longer sinuate apical hair, similar dorsopreapical hair and a short and more straight ventropreapical hair.

Discussion: The species belongs to *P. fucata*-group and is easily distinguishable from all relatives by the single *dc*, strongly punctate body (especially abdomen), black colour of the entire head and characteristic telomere, aedeagal complex, female *T9* with 2 thin hairs, peculiar spermathecae and other features of the male and female terminalia.

Limosina nitens STENHAMMAR, 1854 might be somewhat related species but certainly not conspecific (*L. nitens* STENHAMMAR differs by reddish brown anterior part of frons) and is considered as species dubia (see discussion under *P. fucata*). COLLIN's (1956) record of *L. nitens* from England has been revised and the documentary specimen was found to belong to *Minilimosina splendens* (DUDA), a quite different species (cf. ROHÁČEK, 1977a, b).

Biology: From the data of the type material and according to certain morphological features (e.g. short wings, strongly sclerotized abdomen, reduced tibial and thoracic bristles) the terricolous life-habit of this species was deduced (ROHÁČEK, 1977a). This is well supported by the finding of 8 females (see material examined) caught by means of the soil trap method (ROHÁČEK, 1980). Adults were found in V–IX.

Distribution: Czechoslovakia (ROHÁČEK, 1977a, 1980), Austria (material examined, new), Hungary and Jugoslavia (letter communication by Dr. L. PAPP, 1978).

Paralimosina (Paralimosina) macedonica (ROHÁČEK, 1977), **comb. nov.**

(Figs. 337, 364–375)

Limosina macedonica ROHÁČEK, 1977a: 406
Leptocera (*Limosina*) ? *fucata*: DEEMING, 1969: 67 (Fig. 27)

Type material: Holotype ♂: Jugoslavia, Macedonia, Prespa Geul, Otesevo, 20.–27. 7. 1958, edge of oak wood above lake, R. L. COE leg., BM 1958-417, with HACKMAN's determination label: "*Limosina fucata* ROND. (?)". External genitalia dissected and preserved in a glass microvial pinned below specimen, internal genitalia on slide with same labels as type specimen (BML). Allotype ♀: S. Iran, 20 km E. Yasuj, 2300 m, 16.–17. 6. 1973 (loc. No. 245), Exp. Nat. Mus. Praha leg. (NMP). Paratypes 11 ♂ 6 ♀: same data as for allotype (8 ♂ 3 ♀ NMP, 3 ♂ 3 ♀ JRO) (examined).

Material examined (besides "Type material"): 1 ♀

Bulgaria: 1 ♀ (IZS) — Aitas-Bela reka (BESHOVSKI leg.).

Description:

Male. Total body length 1.95–2.46 mm, general colour blackish brown. Head blackish brown, dusted. Frons similar in colour to in *P. fucata*: velvety blackish M-shaped mark and silvery shining areas of frons (interfrontalia, orbits, frontal triangle) distinct but only a narrow fore margin of frons reddish brown or this part also blackish brown. Gena and face brown, not orange or red. Frontal lunule reddish brown, facial cavity brown, rather shiny. *pvt* distinct though weak; 3 strong *if* and 1–2 smaller in front of them; *g* of medium length. Gena somewhat wider than half the eye-diameter. Arista about 3 times as long as the antenna, rather shortly ciliate.

Thorax black, brown dusted. Mesonotum distinctly punctate, scutellum more strongly transversely dotted with wrinkles. 2 *dc*, the anterior short, *ac* hairs dense, in 10–12 rows between anterior *dc*. Pleurae greyish brown pollinose, completely dull. 2 usual *stpl*; scutellum semicircular. Legs brown, trochanters, knees and tarsi yellowish brown. f_1 and f_3 rather thickened, t_3 slightly curved. Chaetotaxy of t_2 as in Fig. 337, ventrally with only a moderately long *va*. Ratio $t_2 : mt_2 = 1.60-1.84$. Wing (Fig. 364) milky whitish, veins strikingly pale, also *C* pale yellow. *C* not produced beyond R_{4+5}. R_{4+5} basally almost straight, apically strongly bent up to *C*, ending as far from apex of wing as unpigmented part of M_{1+2}. Discal cell short and

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broad, venal processes of M_{1+2} and M_{3+4} very short or absent but outer corners of discal cell never rounded. Alula narrow, small, acute. Wing measurements: length 1.70–2.06 mm, width 0.83–0.99 mm, *C*-index = 1.08–1.25, $t_a - t_p : t_p$ = 1.25–1.73. Halteres yellowish brown.

Abdomen brown, a little dusted. Terga distinctly haired only laterally, sterna haired on the whole surface. *S5* (Fig. 367) simply but densely haired, of normal shape, but behind *S5* there is a small transverse, darkly pigmented sclerite with lateral triangular processes.

Genitalia. Periandrium (Figs. 368, 369) relatively small, ball-shaped, with a projection on right side of the fore margin, shortly and densely haired. Cerci small, each with a relatively short caudal hair. Hypandrium with ventral bifurcate appendage. Telomere (Fig. 366) consisting of 2 lobes. Paler anterior lobe pointed, hind darker lobe relatively shortly haired. Aedeagal complex (Fig. 365) characterized by short, ventrally pointed phallophore, much larger distiphallus and strikingly curved postgonite bearing about 4 small setulae on its concave margin. Ejaculatory apodeme developed but small.

Female. Head, thorax, legs, wing and preabdomen as in the male except for the differences mentioned below. Total body length 1.83–2.38 mm. f_1 and f_3 not thickened, t_3 not curved, t_2 chaetotaxy as in male but *va* longer. Ratio $t_2 : mt_2$ = 1.52 to 1.76. Wing measurements: length 1.75–1.95 mm, width 0.79–0.95 mm, *C*-index = 1.10–1.22, $t_a - t_p : t_p$ = 1.39–1.78.

Postabdomen (Figs. 370–372) short and contracted in natural position. *T7* very sparsely haired. *T8* divided into 2 lateral plates. *T9* rather large, completely bare, shorter than that of *P. fucata*. *S7* transverse and short, *S8* long, narrow, tapering posteriorly and with 2 long hairs. *S9* with deep and narrow anterior incision, posteriorly finely pubescent. Spectacles-shaped sclerite (Figs. 374, 375) small but distinct and of rather complex form, differing from that of related species. Spermathecae (Fig. 373) relatively small, globular, with short sclerotized ducts, thickened near their insertion. Cerci small, each carrying 2 sinuate (apical and dorsopreapical) and 1 shorter straight ventropreapical hair.

Discussion: The species belongs to the *P. fucata*-group but differs essentially from all the related species by 3 strong *if*, reduced red colour on frons, very dense *ac* hairs, wing milky whitish, characteristic telomere and aedeagal complex, female *S9*, spectacles-shaped sclerite, spermathecae etc.

It was recorded from Jugoslavia by Coe (1962a) as uncertainly determined *L.* ? *fucata* Rondani, and the male genitalia were figured by Deeming (1969) under the same name.

Biology: Very poorly known up to the present. Adults were collected at relatively high altitudes (Iran — 2,300 m, Afghanistan — 1,780–1,850 m, Papp, 1978a), in months V–VII.

Distribution: Presumably Iranian species, very rare in Europe (hitherto only Jugoslavia — Coe, 1962a; Deeming, 1969; Roháček, 1977a and Bulgaria — material examined, new); in Asia apparently more common (Iran — Roháček, 1977a; Afghanistan — Papp, 1978a).

Paralimosina (Paralimosina) trichopyga (Richards, 1952), **comb. nov.**

(Figs. 377–379, 381–392)

Leptocera (*Limosina*) *trichopyga* Richards, 1952b: 89
Limosina trichopyga: Roháček, 1977a: 409
Leptocera (*Limosina*) ? *fucata*: Deeming, 1969: 67 (Fig. 25)

Type material: Holotype ♂: Austria, Bösensteingruppe, Nied. Tauern, without further data, Franz leg., BM 1953-357, with determination labels: "*Limosina* (*Scotophilella*) ? *longisetosa* Dahl" and "*Leptocera trichopyga* Rich. ♂, Type". Genitalia dissected and preserved in a glass microvial pinned below specimen, right wing on slide with same label as type specimen (BML, examined). Paratype ♂: Austria, 469X, Franz leg. (location unknown to me, not examined).

Material examined (besides "type material"): 38 ♂ 34 ♀

Czechoslovakia: 37 ♂ 28 ♀ (JRO, SMO, UMO, TMB) — Bohemia: see Roháček (1977a); Moravia: Klokočov (distr. Opava), H. Jeseník Mts.-Skřítek (Roháček leg.) and localities given by Roháček (1977a, 1980); Slovakia: see Roháček (1977a).

Austria: 1 ♂ 6 ♀ (IZI, NMA) — Tyrol: Obergurgl Mt. (Troger leg.); Steiermark: Admont (Strobl leg.).

Description:

Male. Total body length 2.18–2.75 mm, general colour black, brown dusted, subshiny. Head blackish brown, frons colouring as in *P. fucata*, with velvety blackish M-shaped mark, silvery shining orbits, frontal triangle and usually also interfrontalia, and reddish orange anterior part. Face and front of gena also brick-red. Frontal lunule light greyish yellow pollinose, facial cavity brown, rather shiny. Convergent *pvt* present but very minute. 3 *if*, the most anterior small, sometimes also very small seta between two posterior *if*. Gena somewhat wider than one third the longest eye-diameter (Fig. 377), *g* moderately long. Arista 2.6 times as long as antenna, with medium long ciliation.

Thorax black, brown pollinose. Mesonotum densely but finely punctate, scutellum transversely wrinkled; 2 *dc*, 8 rows of *ac* hairs. Pleurae heavily greyish brown pollinose, dull. Scutellum semicircular, wider than long. Legs black, coxae greyish pollinose, trochanters, knees and tarsi light brown. f_1 and f_3 somewhat thickened, t_3 slightly curved. t_2 chaetotaxy (Figs. 378, 379), ventrally with a row of dark, short, comb-like spines and reduced *va* ending this row. mt_2 with a distinctly enlarged ventral seta subbasally (see Fig. 379). Ratio $t_2 : mt_2$ = 1.79–2.05. Wing (Fig. 381) with light brown membrane, veins dark brown, *C* black. *C* not extended beyond R_{4+5}. R_{4+5} very slightly s-shaped, its apical part almost straight, ending nearer the apex of wing than unpigmented part of M_{1+2}. Discal cell short and broad, both venal processes of M_{1+2} and M_{3+4} dark and rather long. Alula small, narrow. Wing measurements: length 1.95–2.45 mm, width 0.91–1.07 mm, *C*-index = 1.12–1.33, $t_a - t_p : t_p$ = 1.68–2.33. Halteres yellow.

Abdomen black, terga with transverse microsculpture, brown dusted, not shining and glabrous as in *P. fucata*, haired only laterally, sterna haired on the whole surface. *S5* (Fig. 384) unmodified and simply haired on the surface, but in the membrane behind posterior margin with a group of minute unpigmented tubercles.

Genitalia. Periandrium (Figs. 385, 386) ball-shaped, shortly haired. Cerci fused with periandrium, each carrying a long caudal hair, otherwise short haired. Hypandrium with ventral bifurcate appendage. Telomere (Fig. 383) bilobed, anterior lobe pale, almost bare, posterior lobe with regular fan of long, black, inwardly curved bristles. Aedeagal complex (Fig. 382) with kidney-shaped phallophore; distiphallus carrying some teeth in the middle. Postgonite slender, a little bent, with about 6 minute setulae on anterior margin. Ejaculatory apodeme present.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 2.26–3.09 mm. f_1 and f_3 not thickened, also t_3 simple. t_2 chaetotaxy on ventral side different, i. e. with only rather long *va*. The

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enlarged ventral seta on mt_2 may be less distinct than in the male. Ratio $t_2 : mt_2 = 1.50-1.82$. Wing measurements: length 1.98–2.48 mm, width 0.88–1.12 mm, *C*-index = 1.14–1.45, $t_a - t_p : t_p = 1.84-2.14$.

Postabdomen (Figs. 387–389) short and retracted in natural position. *T6–T7* very sparsely haired, *T7* extended laterally. *T8* divided into 2 lateral, rather large sclerites. *T9* very small, short, pigmented only basally and carrying a pair of thin dorsal setae. *S7* much narrower than *S6* and wider posteriorly. *S8* roughly triangular, tapering posteriorly, medially more pigmented, with a pair of longer hairs besides some short setulae. *S9* with two long anterior projections, between them deeply incised, posterior part finely pubescent. Spectacles-shaped sclerite (Figs. 391, 392) distinct, large and well sclerotized, particularly its medial part. Spermathecae (Fig. 390) large, hat-shaped, with wrinkled surface and ducts strongly thickened subterminally. Cerci small, with 2 usual sinuate hairs and 1 shorter, slightly curved hair.

Discussion: The species forms together with *P. kaszabi* PAPP and *P. altimontana* (ROHÁČEK) a separate species-group characterized by similar wing venation, t_2 chaetotaxy and long female *S9*. *P. trichopyga* (RICHARDS) differs from both above species in having larger eyes, enlarged seta on mt_2 and punctate and dusted abdominal terga apart from the different male genitalia (telomere, postgonite) and female postabdomen (*S7–S9*, *T9*, spermathecae, spectacles-shaped sclerite).

The doubtfully determined *L.* ? *fucata* RONDANI recorded by DEEMING (1969, Fig. 25) from Austria belongs to this species. According to original description (STENHAMMAR, 1854), *Limosina verticella* STENHAMMAR might perhaps be the same species as *P. trichopyga* but it is impossible to be certain without studying the type specimen (♀) which, however, is not preserved in the STENHAMMAR's collection (KIM, 1972).

Biology: A woodland species, found mostly in forest litter but also on fox, mouflon and human excrement, often together with *P. fucata* (see ROHÁČEK, 1977a). It was caught also on decayed fungi (*Russula* spec.), by means of photoeclector (TROGER & ROHÁČEK, 1980) and by soil traps (ROHÁČEK, 1980). It is obviously a terricolous species occurring chiefly in submountains and mountains (up to 1,950 m in Alps — ROHÁČEK, 1977a) in months V–X.

Distribution: Hitherto known from only Central Europe — Austria (STROBL, 1898, 1910 — as *Limosina verticella* STENHAMMAR; RICHARDS, 1952b; DEEMING, 1969; ROHÁČEK, 1977a; TROGER & ROHÁČEK, 1980) and Czechoslovakia (ROHÁČEK, 1977a, 1978b, 1980).

Paralimosina (Paralimosina) kaszabi PAPP, 1973

(Figs. 376, 380, 393–404)

Paralimosina kaszabi PAPP, 1973a: 386
Limosina (Scotophilella) verticella: DUDA, 1918: 148 (part.)
Limosina (Limosina) fucata: DUDA, 1938: 134 (part.)
Leptocera (Limosina) ? *fucata*: DEEMING, 1969: 67 (Figs. 23, 24)
Limosina latigena ROHÁČEK, 1977a: 415, **syn. nov.**

Type material:
Paralimosina kaszabi PAPP: Holotype ♀: Mongolia, Chövsgol aimak, 6 km WNW von Somon Tosoncengel, 1480 m, Dr. Z. KASZAB, 18. VI.–20. VII. 1968 (Nr. 980) (not examined, TMB); paratypes 3 ♀: Archangaj aimak, Changaj Gebirge, 8 km W von Somon Urdtamir, 1620 m, 19. VI. 1966, Dr. Z. KASZAB (Nr. 538) (TMB, 2 ♀ examined).
Limosina latigena ROHÁČEK: Holotype ♂: Czechoslovakia, Bohemia, Krkonoše Mts., Vítkovice, 16. 8. 1958, from hay, J. ZUSKA leg. (NMP); Allotype ♀ : same locality, 18. 6. 1964, sweeping undergrowth of very young mixed wood, J. ZUSKA leg. (JZP). Paratypes: 1 ♂ 1 ♀ — 1 ♀ same data as for holotype (JRO); 1 ♂ FRG, nr. Göttingen, Reinhausen, 10. 6. 1962, BM 1962-334, J. C. DEEMING leg. (BML), with determination label: "*Leptocera (Limosina)* ? *fucata* ROND. ♂, J. C. DEEMING det., 1967". The specimen is in bad condition but all taxonomically important parts are preserved (examined).

Material examined (besides "Type material"): 2 ♂ 3 ♀
Czechoslovakia: 1 ♂ 1 ♀ (SMO) — Moravia: H. Jeseník Mts.-Skřítek, Nectava (valley) (ROHÁČEK leg.).
Austria: 1 ♂ 2 ♀ (JRO, NMA) — Tyrol: Badgastein (STOCKNER leg.); Steiermark: Steierische Alpen (STROBL leg.).

Description:
Male. Total body length 2.42–2.58 mm. General colour dark brown, except for the abdomen dusted, subshiny. Head brown, frons similarly coloured to *P. fucata*, i.e. with silver frontal triangle, orbital stripes, velvety black M-shaped mark and brick-red fore margin and the rest of frons between interfrontalia and orbits. Frontal lunule brown, brownish yellow pollinose. Facial cavity dark brown, gena reddish, posteriorly brown. *pvt* reduced to a minute setulae behind ocellar triangle. 2 small *ads* between *ors* present. 3 *if*, the most anterior short and weak, *g* moderately long. Gena wide, wider than the longest eye-diameter, eyes reduced, flat (Fig. 376). Arista about 2.8 times as long as the antenna, with medium long ciliation. 3rd antennal segment paler brown.

Thorax dark brown, light brown pollinose, subshining. 2 *dc*, *dc* microsetae between anterior and posterior *dc* a little longer than *ac* hairs which are in 8 rows between anterior *dc*. Scutellum much wider than long. Pleurae blackish brown, densely pollinose, all sutures between pleural sclerites brownish yellow. Legs brown, only trochanters, knees and tarsi light yellowish brown. f_1 and f_3 somewhat thickened. t_2 chaetotaxy as in Fig. 380, ventrally with a row of short comb-like black spines and a relatively short *va*. mt_2 slender, long. Ratio $t_2 : mt_2 = 1.55-1.64$. Wing (Fig. 393) light brownish, veins brown. *C* not produced beyond R_{4+5}. R_{4+5} sinuate, with straight apical part, ending nearer the apex of wing than unpigmented part of M_{1+2}. Discal cell short, with short coloured processes of M_{1+2} and M_{3+4}. Alula small, narrow. Wing measurements: length 2.10–2.38 mm, width 0.85–1.03 mm, *C*-index = 1.16–1.24, $t_a - t_p : t_p = 1.75-1.94$. Halteres yellow.

Abdomen blackish brown, in comparison to *P. trichopyga* with scarcely punctate and, despite the fine pruinosity, shiny terga; dorsally very sparsely, ventrally more densely haired. *S5* (Fig. 396) unmodified, the longest medially, without prominent structures and shortly haired in the middle of posterior margin.

Genitalia. Periandrium (Figs. 397, 398) ball-shaped, shortly haired. Cerci fused with periandrium, each with a long caudal hair and some shorter hairs. Hypandrium with a ventral bifurcate appendage. Telomere (Fig. 395) with 2 lobes, the an-

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terior lobe large, pale and almost bare, posterior lobe darker, with numerous bristles. Aedeagal complex (Fig. 394) with kidney-shaped phallophore as in *P. trichopyga* but distiphallus different; postgonite slender, with 3 small setulae on anterior margin, apex button-like, enlarged. Ejaculatory apodeme present.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 2.25 to 2.90 mm. f_1 and f_3 simple, t_2 ventrally without a row of short spines, instead this a long *va*. Ratio $t_2 : mt_2 = 1.50-1.62$. Wing measurements: length 2.42–2.51 mm, width 0.95–1.15 mm, *C*-index = 1.10–1.20, $t_a - t_p : t_p = 1.78-1.91$.

Postabdomen (Figs. 399–401). *T6–T7* sparsely haired, *T8* divided into 2 lateral sclerites, *T9* longer than in *P. trichopyga*, pigmented only anteriorly and with a pair of rather long dorsal hairs. *S8* very long, narrow, larger than in *P. trichopyga*, with 2 longer ventral hairs. *S9* very long, yet longer than that of *P. trichopyga*, especially the anterior projections long, between them a very deep and narrow incision. Spectacles-shaped sclerite (Figs. 403, 404) large and well sclerotized, dark pigmented medially. Spermathecae (Fig. 402) large, vesiculate, somewhat flattened, their sclerotized ducts longer than in related species and thickened rather far from their insertion. Cerci small, with a long sinuate apical hair, a shorter dorsopreapical and ventropreapical hair.

Discussion: The species belongs to the *P. trichopyga*-group and most closely resembles *P. altimontana* (Roháček, 1977) from Nepal. The most important features separating *P. kaszabi* Papp from its congeners are: strongly reduced eyes, long bristles on t_2, characteristically shaped and bristled telomere, aedeagal complex with button-like apex of postgonite, very large female *S8* and *S9*, the shape of spermathecae and spectacles-shaped sclerite.

P. kaszabi was described by Papp (1973a) from only 4 females, so that I have previously not recognized its identity and its position in the *L. fucata*-group (Roháček, 1977a), and described it from Central European specimens as *Limosina latigena*. The study of the female postabdomen of paratypes of both species clearly demonstrated their conspecifity and therefore, *Limosina latigena* Roháček, 1977, becomes a synonym of *Paralimosina kaszabi* Papp, 1973.

As mentioned by Roháček (1977a), Duda (1918, 1938) probably described, under the name *L. verticella* Strobl (*L. fucata* Rondani), a mixed series which included the above species; his descriptions agree fully with *P. fucata* with exception of the postgonites, which are obviously identical with those of *P. kaszabi* Papp. Deeming (1969) included this species under *L.* ? *fucata* Rondani (cf. his Figs. 23, 24).

Biology: Hitherto very poorly known. Some of the type specimens were obtained from hay, 1 ♂ was caught by soil traps (Roháček, 1980, as *L. latigena*). 1 ♀ by sweeping over peat-bog meadow and 1 ♂ 1 ♀ by Malaise-trap. The species seems to be associated with higher altitudes (as with the majority of related species) and was found up to 1,800 m in Alps. Adults were found in VI–VIII but the occurrence period is in reality certainly longer.

Distribution: Hitherto only Central Europe — FRG (Deeming, 1969; Roháček, 1977a), Czechoslovakia (Roháček, 1977a, 1980) and Austria (material examined, new) — and Mongolia (Papp, 1973a).

Subgenus ***Canarisina*** **subgen. nov.**

Type species: *Limosina* (*Scotophilella*) *Beckeri* Duda, 1918

Diagnosis: The subgenus can be characterized as follows.

(1) *pvt* absent
(2) 3 *if*, the middle very long, crossing
(3) 3–5 small *ads* inside and below *ors*
(4) *g* of medium length
(5) frons without velvety black M-shaped mark
(6) 2 *hu*, the internal reduced to a microseta
(7) 2 *dc*, both postsutural
(8) 8–10 rows of *ac* hairs in front of suture
(9) only 1 (posterior) *stpl* developed
(10) scutellum wider than long, roughly semicircular
(11) f_1 and f_3 of the male not thickened
(12) t_2 chaetotaxy as in Figs. 405–407, ventrally without *av* below half of tibia
(13) *C* not extending beyond R_{4+5}
(14) R_{4+5} sinuate, apically strongly curved up to *C*
(15) discal cell of medium length, with appendages of M_{1+2} and M_{3+4}

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(16) alula small and narrow
(17) female postabdomen short, not strikingly narrower than preabdomen at 6th segment
(18) male *S5* with prominent structures posteromedially
(19) periandrium uniformly shortly haired; each cercus carrying a longer caudal hair
(20) hypandrium without ventral bifurcate appendage
(21) telomere short, bilobed, of complex form and armed with some very robust and short ventral spines
(22) phallophore not reduced, compact, without epiphallus
(23) distiphallus long, relatively simple but with some groups of small spines
(24) postgonite long, slender and slightly curved
(25) ejaculatory apodeme apparently absent (not found)
(26) female *T7* extended laterally
(27) female *T8* divided into 2 lateral sclerites
(28) female *T9* short, with a pair of dorsal bristles
(29) female *S8* long, narrow, obtriangular, thus tapering anteriorly (Fig. 416)
(30) female *S9* short, not incised anteriorly
(31) spectacles-shaped sclerite developed but weakly sclerotized
(32) spermathecae more or less ball-shaped, sclerotized parts of ducts of medium length
(33) female cerci small, slender, widely separated each from other, each with 2 longer sinuate and 1 shorter, slightly curved hair.

Discussion: The subgenus *Canarisina* subgen. nov. differs from the subgenus *Paralimosina* s. str. in the following features: M-shaped mark on frons absent, male f_1 and f_3 simple, middle pair of *if* enlarged, male *S5* with prominent structures, telomere with ventral robust spines, phallophore not reduced and distiphallus spinulate, female *S9* short and without anterior incision. In addition to a number of characters which *Canarisina* shares with *Paralimosina* s. str. (cf. the diagnosis of the genus) there are some features indicating a possible affinity to the genus *Spelobia*, e.g. the above mentioned ventral spines of telomere, simple hypandrium, larger phallophore or short female *S9*.

The subgenus *Canarisina*, represented only by the W. Mediterranean *P. beckeri* (DUDA, 1918), seems to be an intermediate taxon connecting the genera *Paralimosina* and *Spelobia*. It is thought to be further evidence of their common origin[8].

Paralimosina (Canarisina) beckeri (DUDA, 1918), **comb. nov.**

(Figs. 405–418)

Limosina (*Scotophilella*) *Beckeri* DUDA, 1918: 151
Leptocera (*Scotophilella*) *Beckeri*: DUDA, 1925: 160 (key)
Limosina (*Limosina*) *Beckeri*: DUDA, 1938: 109

Type material: Holotype ♀ labelled: "Orotava, I., 46987"; "*pygmaea* MEIG. det. BECKER"; "*Beckeri* m. nov. sp. ♀ det DUDA" (ZMB, examined).

Material examined (besides "Type material"): 1 ♂ 4 ♀

Canary Islands: 1 ♂ 4 ♀ (ZMH, ULT) – Gr. Canaria: Los Lagunetas (FREY leg.); Hierro: Valverde (LINDBERG leg.); Tenerife: Agua mansa (FREY leg.), Mte del Agua (BAEZ leg.), Bco. del Agua (OROMI leg.).

Description:

Male (mas novus). Total body length 1.67 mm, general colour blackish brown, somewhat pruinose, subshiny. Head brown. Frons posteriorly brownish black, anteriorly reddish brown, shiny, despite some pruinosity. Interfrontalia and orbits silvery dusted. 3 *if*, the middle pair very large and crossing; *pvt* absent. 3–5 small *ads* inside and below *ors*. Frontal lunule and facial cavity brown, the latter shiny. Gena brown, *g* moderately long. Eye of normal size, its longest diameter 4 times the narrowest genal width. Antennae brown, 3rd segment somewhat longer ciliate than arista. Arista about 4 times as long as the antenna, medium long ciliate.

Thorax blackish brown, mesonotum shiny, pleurae more dusted, duller. 1 large external *hu*, the internal reduced to a microseta. 2 *dc*, both behind suture; *ac* hairs in 8–10 rows between anterior *dc*. Only posterior *stpl* developed. Scutellum wider than long. Legs brown, trochanters, knees and tarsi paler. f_1 and f_3 not thickened, as they are in *Paralimosina* s. str. species. f_2 basally with a short ventral row of short spines. t_2 chaetotaxy as in Fig. 407, ventrally with a row of short spines terminated by reduced *va*. mt_2 long and slender. Ratio $t_2 : mt_2 = 1.40$. Wing (Fig. 408) with brownish membrane and brown veins. Cs_1 relatively sparsely haired, *C* not overpassing R_{4+5}. R_{4+5} sinuate and apically strongly curved up to *C*. Discal cell of medium length, broad, with small pigmented process of M_{1+2} and longer one of M_{3+4}. Alula small, narrow. Wing measurements: length 1.47 mm, width 0.65 mm, *C*-index = 1.10, $t_a - t_p : t_p = 2.70$. Halteres with brownish black knob sharply contrasting with yellow stem.

Abdomen brown, with sparsely haired, glabrous and strikingly shiny terga; sterna more densely but shortly haired and somewhat pollinose, subshiny. *T1+2* simply pigmented. *S5* very characteristic (Fig. 411), with a paler pigmented flat lobe on posterior margin connected by membrane with *S5*. In front of this lobe, there is a medial, dark pigmented and apically rounded process and 2 groups of thick bristles and spines.

Genitalia. Periandrium (Figs. 412, 413) small, shortly haired. Hypandrium relatively short, without ventral appendage. Cerci distinctly developed, each bearing a long caudal hair besides 4 shorter setulae. Telomere (Fig. 410) with anterior lobe

[8] Four brachypterous species described recently by PAPP & ROHÁČEK (1981) from Canary Is. (*P. anaptera*, *P. franzi*, *P. gomerensis* and *P. pilifemorata*) also belong to *Canarisina* subgen. nov.

DOI: 10.21248/contrib.entomol.33.1.3-195

ventrally bearing a robust, short spine with blunt apex, and with larger and complex posterior lobe carrying an external densely bristled keel and an internal projection with 3 robust spines (the largest external, 2 smaller internal). Aedeagal complex (Fig. 409) with compact, relatively large phallophore and long, slender distiphallus armed by groups of small spines. Postgonite long, slender, slightly bent, apically with a tubercle, subterminally with 2 minute setulae. Ejaculatory apodeme not found.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.79 to 2.06 mm. f_2 ventrally without basal row of short spines. t_2 with all bristles comparatively longer than in male, ventrally with only a longer *va* (Figs. 405, 406). Ratio $t_2 : mt_2 = 1.50-1.54$. Wing measurements: length 1.67–1.75 mm, width 0.77 to 0.83 mm, *C*-index = 1.09–1.15, $t_a - t_p : t_p = 2.13-2.30$.

Postabdomen short (Figs. 414–416). *T7* enlarged laterally. *T8* medially completely membraneous, divided into 2 lateral, strongly sclerotized plates. *T9* short, transverse, with a pair of dorsal setae. *S8* obtriangular, tapering anteriorly, with 4 long hairs in front of posterior margin. *S9* relatively short, with some minute setulae on posterior margin. Inside 8th segment there is a spectacles-shaped sclerite, weakly sclerotized and pale pigmented (Fig. 418). Spermathecae (Fig. 417) small, ball-shaped, with sclerotized parts of ducts of medium length. Cerci small, slender, widely separated, each with a longer apical, shorter ventro- and dorsopreapical sinuate hair and 2 small lateral hairs.

Discussion: The species is easily separable from all known congeners by the following combination of external characters — t_2 chaetotaxy, very long middle *if*, absence of M-shaped mark on frons, strongly upcurved R_{4+5}, very shiny and glabrous abdomen — apart from a number of peculiarities in the male and female terminalia.

The species was described from a single female; the first males were recorded (but not described) by Papp (1977a). The validity of *P. beckeri* (Duda) has been confirmed by study of the female holotype and some additional material including one male.

Biology: A rare species with very restricted distribution (see below). Adults were found in I, III, VII, VIII (Hackman, 1958, 1969b; Papp, 1977a and material examined), in Sierra Nevada (Spain) up to 2,200 m (Hackman, 1969b). More exact data on its biology are not available.

Distribution: Probably a W. Mediterranean species known from Canary Islands (Duda, 1918, 1925, 1938; Frey, 1936; Hackman, 1958; Papp, 1977a) and South Spain (Hackman, 1969b), thus not endemic of Canary Is. as Papp (1977a) suggests. On the other hand I consider the record of Vanschuytbroeck (1950a) from Zaire to be very doubtful.

9. Genus ***Spelobia*** Spuler, 1924, nom. restit., **stat. nov.**

Spelobia Spuler, 1924: 376, 1925a: 117 (as subgen.)
Type species: *Limosina tenebrarum* Aldrich, 1897 (orig. des.)

Group of *L. crassimana* Haliday: Richards, 1930: 300

Diagnosis: The genus can be characterized by the following features.

(1) *pvt* well developed, often in addition to true (posterior) *pvt* an additional false pair in front of it
(2) 3–6 (rarely 7) *if* of varying length in different species
(3) 2–8 *ads* inside and below *ors*
(4) *g* of small to medium length
(5) 2 *hu*, the internal usually minute; somewhat enlarged in subgen. *Bifronsina*
(6) 2–3 *dc* (rarely only 1 *dc* in extra-European species), all postsutural
(7) *ac* in 6–10 rows in front of suture; the medial prescutellar *ac* pair more or less enlarged
(8) 2 *stpl*, the anterior small
(9) t_2 with rich chaetotaxy, *av* below middle usually present (absent in sg. *Eulimosina* and some *Spelobia* s. str.)
(10) *C* not extending beyond R_{4+5}
(11) R_{4+5} usually straight, rarely slightly apically bent, recurved or somewhat sinuate
(12) discal cell medium long, rarely short, usually with distinct appendages of M_{1+2} and M_{3+4} beyond t_p (except for brachypterous forms)
(13) alula large and broad to small and narrow
(14) female postabdomen short, not narrower than preabdomen at 6th segment
(15) male *S5* with posteromedial comb of spines, tubercles, or with simple cuticular lamellae
(16) periandrium with a long dorsolateral hair, often also with a shorter laterocaudal hair (both absent only in *S. villosa*)

DOI: 10.21248/contrib.entomol.33.1.3-195

(17) male cerci simple, each usually with a longer caudal seta or hair; only in subgen. *Eulimosina* male cerci reduced and fused with periandrium
(18) hypandrium of medium length and rather robust; reduced only in subgen. *Bifronsina*
(19) telomere relatively simple and usually with a robust ventral spine and micropubescence; rarely small and without them (subgen. *Eulimosina*)
(20) phallophore compact, robust; epiphallus not developed
(21) distiphallus well sclerotized, sometimes of rather complex structure (subgen. *Eulimosina*, subgen. *Bifronsina*)
(22) postgonite slender and rather long, with some minute setulae
(23) ejaculatory apodeme may be developed but always small
(24) female *T6—T7* simple, *T8* dorsomedially often weakly sclerotized or divided into 2 sclerites
(25) female *T9* rather short, wide, roughly triangular, with some dorsal setulae
(26) female *S6* and *S7* simple
(27) female *S8* comparatively large, transverse, posteriorly tapered. Sometimes behind *S8* small additional sclerites (subgen. *Bifronsina*)
(28) female *S9* transversely oblong to short, band-like
(29) spectacles-shaped sclerite present, sometimes peculiarly modified (subgen. *Eulimosina*)
(30) spermathecae more or less tyre-shaped, rarely cylindrical
(31) female cerci short and robust, sinuate haired.

Discussion: *Spelobia* SPULER, 1924, is a rather heterogeneous but supposedly monophyletic genus containing species with more or less straight R_{4+5} not overpassed by *C*, rich t_2 chaetotaxy, well developed *pvt*, similar structure and armature of male *S5*, periandrium and aedeagal complex (compact phallophore, slender postgonite) and rather simple spectacles-shaped sclerite (except for subgen. *Eulimosina*). The homogeneity of this genus is somewhat reduced by its aberrant subgenera *Eulimosina* and *Bifronsina* which are distinguished from other included species by a number of autapomorphic features (see discussion under subgen. *Eulimosina* and *Bifronsina*). Further study is necessary to find if it would not be better to consider them separate genera.

The genus *Spelobia* seems to be related to *Pullimosina* gen. nov. (cf. general similarities in the construction of male genitalia and female postabdomen) and is treated as its sister-group here — see chapter "Phylogeny" and cladogram in Fig. 64.

Spelobia was originally erected by SPULER (1924) as a monotypic subgenus of *Leptocera* for *Limosina tenebrarum* ALDRICH, 1897. Later, SPULER (1925a) described it again and included a second species *Leptocera* (*Spelobia*) *lucifuga* SPULER, 1925. RICHARDS (1964b: 146) synonymized the subgenus *Spelobia* SPULER with *Limosina* MACQUART. Although I have not been successful in borrowing material of *Limosina tenebrarum* ALDRICH, I have recognized the identity of *Spelobia* as the *Limosina crassimana*-group sensu RICHARDS (1930). RICHARDS (1964b) had examined some specimens of *L. tenebrarum* and stated that it resembles *Leptocera* (*Limosina*) *semioculata* RICHARDS, 1964, very closely including the male *S5* and genitalia. Because *L. semioculata* and hence also *L. tenebrarum* clearly belong to the *Limosina crassimana*-group (see Fig. 28 in RICHARDS, 1964b), *Spelobia* SPULER, 1924, must be used as the name of the genus containing this group despite the fact that *Spelobia* originally contained only 2 cavernicolous species with some striking external features. Recently, Prof. K. C. KIM (Pennsylvania, USA) kindly provided me with figures of the male *S5* and genitalia of *Limosina tenebrarum* ALDRICH which definitely confirm the congenerity of it with the *Limosina crassimana* (= *clunipes*) group sensu RICHARDS (1930). *Spelobia* is thus another paradoxical name in Sphaeroceridae because the majority of species belonging to this genus do not live in caves.

The genus *Spelobia* includes 43 species in the Palaearctic, 24 of them occurring in Europe, and some other non-Palaearctic species. 2 new subgenera, viz. *Eulimosina* subgen. nov. and *Bifronsina* subgen. nov. are established for the 2 most aberrant Palaearctic species of the genus *Spelobia*; the remaining 41 species belong to the subgenus *Spelobia* s. str. They are fully enumerated under respective subgenera.

DOI: 10.21248/contrib.entomol.33.1.3-195

Key to European subgenera and species

1 t_2 without *av* below middle but in male with a long row of short ventral spines. Telomere without ventral robust spine (Fig. 425). Spectacles-shaped sclerite very large, with a long ventral tongue-shaped projection (Figs. 433, 434) (*Eulimosina* subgen. nov.) — Head bright yellow, only occiput, ocellar triangle and antennae blackish brown. Terga characteristically pollinose (Fig. 419), male *S5* (Fig. 426), aedeagal complex (Fig. 424) . . . . . *S.* (*E.*) *ochripes* (MEIGEN)

— t_2 with *av* below middle. Telomere with a robust ventral spine. Spectacles-shaped sclerite of normal form, without ventral projection. European species with differently coloured head 2

2(1) 2 *dc*; alula large and apically rounded. Telomere short and wide, hypandrium longer, phallophore without anterodorsal projection, distiphallus more simple. At most 1 additional sclerite behind female *S8* (*Spelobia* s. str.) 3

— 3 *dc* (2 anterior short); alula small and pointed. Telomere longer and narrower (Fig. 697), hypandrium small, phallophore with anterodorsal projection, distiphallus of very complex form. Female with more additional minute sclerites behind *S8* (Fig. 703) (*Bifronsina* subgen. nov.) — Head with yellowish anterior part of frons and 2 basal antennal segments, R_{4+5} apically slightly recurved (Fig. 695) . . . . . *S.* (*B.*) *bifrons* (STENHAMMAR)

3(2) t_2 proximally with 1 or more *pd* (cf. Figs. 519, 627, 629, 665) 4

— t_2 proximally without *pd* (a small *pd* may be present only in *S. palmata* — see Fig. 472) 7

4(3) Eye reduced (Fig. 518), its largest diameter smaller than narrowest genal width. Wing usually shorter than abdomen and often strongly reduced (Figs. 521, 523). Legs very long, slender; t_2 with more (2—3) proximal *pd* (Fig. 519). Male genitalia (Figs. 524—528) and female postabdomen (Figs. 529—531) . . . . . *S.* (*S.*) *pseudonivalis* (DAHL)

— Eye of normal size, its largest diameter more than 3 times as long as the narrowest genal width. Wing never abbreviated. Legs not strikingly prolonged, t_2 chaetotaxy different 5

5(4) t_2 with 1 *pd* near the middle (Fig. 627). Wing broad, usually with slightly sinuate R_{4+5} (Fig. 632). Male *S5* with posteromedial simple lamella (Fig. 637). *T1+2* with basal weakly sclerotized and pale pigmented area. Male genitalia (Figs. 633—636), female postabdomen (Figs. 638—640) . . . *S.* (*S.*) *nana* (RONDANI)

— t_2 with no *pd* near the middle. Wing narrower, R_{4+5} not sinuate, straight, at most slightly curved up to *C*. Male *S5* with posteromedial comb of spines, *T1+2* without paler area 6

6(5) Facial cavity, frontal lunule, face and gena yellow. R_{4+5} slightly bent to *C* (Fig. 667). t_2 with long distal *ad* (Fig. 665). Male *S5* (Fig. 672), telomere (Fig. 669), female postabdomen (Figs. 673—675) and spermathecae (Fig. 676) very characteristic . . . . . ***S. (S.) pappi* spec. nov.**

— Entire head blackish brown, only anterior margin of frons paler brown. R_{4+5} almost straight. t_2 with short distal *ad* (Fig. 629). Male *S5* (Fig. 648), telomere (Fig. 647), female postabdomen (Figs. 649—651) and spermathecae (Fig. 652) different . . . . . *S.* (*S.*) *parapusio* (DAHL)

7(3) t_2 with more or less paired long distal bristles on dorsal side (Figs. 578, 603, 607, 622), *ad* in apical fourth to third short. Alula narrow (Figs. 580, 610, 611) . . 8

— t_2 with *d* situated much more distally than the adjacent *pd*; *ad* in apical fourth to third longer (Figs. 452, 472, 548, 678). Alula broad (Figs. 439, 456, 563), rarely narrow (Fig. 681) 14

8(7) Facial cavity, face and part of gena yellow to yellowish brown (rarely reddish brown) 9

— Facial cavity, face and gena brown to blackish brown 11

9(8) Male telomere with robust anterior part (Figs. 593, 596), postgonite thick (Figs. 594, 597), setae in the middle of male *S5* hook-like, curved. Female spermathecae with conically dilated terminal parts of spermathecal ducts (Fig. 601). Spectacles-shaped sclerite weakly sclerotized 10

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— Male telomere with distinctly pointed anterior part (Fig. 613), postgonite slender and tapered distally (Fig. 614), setae in the middle of male *S5* simple and fine. Female spermathecae (Fig. 618) with simple ducts, spectacles-shaped sclerite medially heavily sclerotized (Fig. 620) . . . *S.* (*S.*) *luteilabris* (RONDANI)

10(9) Face, facial cavity and gena yellow to orange brown. Terminal fold of M_{1+2} more divergent from R_{4+5} (Fig. 591), *C*-index lower on the average (0.87—1.17). Setae in the middle of male *S5* thicker (Fig. 592), telomere longer (Fig. 593) with longer ventral spine . . . . . *S.* (*S.*) *rufilabris* (STENHAMMAR)

— Face, facial cavity and gena yellowish brown to reddish brown. Terminal fold of M_{1+2} more parallel with R_{4+5} (Fig. 610), *C*-index usually higher (1.07—1.38). Setae in the middle of male *S5* finer (Fig. 595). Telomere shorter (Fig. 596) with shorter ventral spine . . . . . ***S. (S.) ibrida* spec. nov.**

11(8) Male *S4* with a short posteromedial row of spines (Fig. 576), male *S5* as in Fig. 575. Telomere (Fig. 583). Female spermathecae grooved, with simple ducts (Fig. 588). Spectacles-shaped sclerite (Figs. 589, 590). 4—7 *if*, t_2 with more proximal *ad*, t_3 very rarely with dorsopreapical seta (in mutant specimens — Fig. 577) . . . . . *S.* (*S.*) *pseudosetaria* (DUDA)

— Male *S4* without a row of small spines, male *S5* differently pigmented and armed. Telomere, spermathecae and spectacles-shaped sclerite different 12

12(11) t_2 with only 1 proximal *ad* (Fig. 622). mt_2 longer and more slender, ratio t_2 : mt_2 less than 1.80. Male *S5* (Fig. 624) with characteristic pigmentation and large three-fold posteromedial comb of spines. Telomere (Fig. 625), aedeagal complex (Fig. 626). Female unknown . . . . . ***S. (S.) ulla* spec. nov.**

— t_2 with more (2—3) proximal *ad*. mt_2 shorter and thicker, ratio t_2 : mt_2 more than 1.90 (normally about 2.0). Male *S5* with different pigmentation and armature 13

13(12) Female spermathecae with simple slender ducts (Fig. 618), spectacles-shaped sclerite (Fig. 620) heavily sclerotized medially . . . . . *S.* (*S.*) *luteilabris* ♀

— Female spermathecae with conically dilated terminal parts of ducts (Fig. 601). Spectacles-shaped sclerite weakly sclerotized (Fig. 602). Male with short telomere with short ventral spine (Fig. 596) and its *S5* with fine, hook-like curved setae in the middle (Fig. 595) . . . . . ***S. (S.) ibrida* spec. nov.**

14(7) Anterior part of frons, frontal lunule, face, facial cavity and gena bright yellow. 3 *if*, the middle pair very long and crossing. Mesonotum and abdomen very shiny. R_{4+5} distinctly though slightly sinuate (Fig. 658). Male telomere (Fig. 660), *S5* (Fig. 663) and aedeagal complex (Fig. 659) highly characteristic . . . . . ***S. (S.) belanica* spec. nov.**

— Head with different colouring, especially facial cavity and gena much darker; *if* not as above. Mesonotum and abdomen more pruinose and duller. R_{4+5} straight, at most apically slightly bent to *C*. Male telomere, *S5* and aedeagal complex different 15

15(14) Alula narrow (Fig. 681). Male t_1 simple and slender. Male *S5* (Fig. 686) with 2 pairs of very long curved bristles. Telomere (Fig. 683) with peculiarly prolonged and downcurved anterior part. Aedeagal complex as in Fig. 682. Female with very slender cerci, short *T9* and unusual, elongate cylindrical spermathecae (Fig. 690) . . . . . *S.* (*S.*) *cambrica* (RICHARDS)

— Alula larger, broad. Male t_1 simple or clavate. Male *S5*, telomere and aedeagal complex different. Female spermathecae always tyre-shaped and cerci different, shorter 16

16(15) Preabdomen very long haired, especially on lateral margins of terga. Periandrium without long dorsolateral hair and shortly densely haired (Fig. 539). Male *S5* (Fig. 541), telomere (Fig. 538). Female postabdomen (Figs. 542—544), spectacles-shaped sclerite (Figs. 546—547) and spermathecae (Fig. 545). R_{4+5} slightly curved up to *C* (Fig. 536), male t_1 slender and simple . . . . . *S.* (*S.*) *villosa* (DUDA)

— Preabdomen short haired. Periandrium always with a long dorsolateral hair-like bristle. R_{4+5} usually straighter. Male t_1 slender or clavate 17

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17(16) Males 18
— Females (female of *S. faeroensis* is unknown and hence not included in the key) 28

18(17) t_1 simple, slender, at most with a shallow anterior impression; fore tarsi slender, not dilated (Fig. 436) 19
— t_1 strongly thickened, clavate, with distinct anterior impression or incision; fore tarsi dilated and flattened (Fig. 437) 24

19(18) mt_2 long and slender (ratio $t_2 : mt_2 = 1.54-1.72$). Medial prescutellar *ac* pair short, hardly more than twice as long as other *ac* microsetae 20
— mt_2 shorter and thicker (ratio $t_2 : mt_2 = 1.90-2.31$). Medial prescutellar *ac* pair strongly enlarged, usually almost as long as anterior *dc* 21

20(19) Eye normal, its diameter more than 3.3 times the narrowest genal width. Male *S5* with a group of thick and apically hook-like curved spines in the middle (Fig. 511). Telomere (Fig. 508) with shorter ventral spine and much shorter setiform hairs on posterior part; mt_2 without *av* spines . . . *S.* (*S.*) *czizeki* (Duda)
— Eye reduced, its diameter less than 1.8 times the narrowest genal width. Male *S5* with a group of dense, thick but simple spines in the middle (Fig. 488). Telomere (Fig. 489) with very long ventral spine and long setiform hairs on posterior part; mt_2 with 4—6 short *av* spines (Fig. 500) . . **S. (S.) talis spec. nov.**

21(19) Telomere posteriorly projecting ventrally (Figs. 556, 565). *S5* with a group of thick short spines in front of five-fold posteromedial comb of spines (Fig. 555) 22
— Telomere not projecting ventrally. *S5* with fine setae on disc in front of twofold posteromedial comb of spines (Figs. 458, 461) 23

22(21) Telomere with shorter, sharply pointed posteroventral projection (Fig. 556). Phallophore not strikingly enlarged (Figs. 557) . . . **S. (S.) quaesita spec. nov.**
— Telomere with long, slender, lancet-shaped projection (Fig. 565). Phallophore strikingly enlarged, longer than distiphallus (Fig. 564) . . . . . *S.* (*S.*) *simplicipes* (Duda)

23(21) *T1+2* with basal medial pale pigmented area. *S5* with simple bristles in front of posteromedial comb of spines; posterior row of this comb composed of spines with filiform tips (Fig. 461). Telomere (Fig. 462) with longer ventral spine and less extensive micropubescence. Postgonite (Fig. 463) more slender apically . . . . . *S.* (*S.*) *baezi* (Papp)
— *T1+2* without basal pale pigmented area. *S5* with hook-like curved setulae in front of posteromedial comb of spines; posterior row of this comb composed of short pointed spines (Fig. 458). Telomere (Fig. 459) with short and weak ventral spine and mainly covered with micropubescence. Postgonite apically thicker (Fig. 460) . . . . . *S.* (*S.*) *faeroensis* (Deeming)

24(18) *T1+2* with weakly sclerotized and pale pigmented mediobasal area 25
— *T1+2* simply pigmented and heavily sclerotized 27

25(24) Medial prescutellar *ac* pair enlarged. mt_2 short, not prolonged. *S5* with simple, weak setae in front of posteromedial comb of spines with filiform tips (Fig. 461). Telomere with slender ventral spine (Fig. 462) . . . . . *S.* (*S.*) *baezi* (Papp)
— Medial prescutellar *ac* pair slightly enlarged. mt_2 longer and more slender. *S5* with thick spines in front of posteromedial comb of spines with shortly pointed tips. Telomere with robust ventral spine 26

26(25) mt_2 strikingly prolonged (Fig. 498); arista shortly ciliate. Telomere (Fig. 486) with longer ventral spine, more robust anterior part and longer setiform hairs posteroventrally. *S5* (Fig. 485) with a group of short, thick spines in the middle. Dorsopreapical projection of distiphallus with a pale dorsal process (Fig. 487) . . . . . *S.* (*S.*) *talparum* (Richards)
— mt_2 less prolonged; arista of medium long ciliation. Telomere (Fig. 476) with shorter ventral spine, narrower anterior part and shorter setiform hairs posteroventrally. *S5* (Fig. 475) with only some robust spines situated more posteriorly. Distiphallus with doubly serrate dorsopreapical projection (Fig. 477) . . . . *S.* (*S.*) *palmata* (Richards)

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27(24) mt_2 shorter and thicker (Fig. 453), slightly longer than 2nd segment. Medial prescutellar *ac* pair considerably enlarged. Wing paler greyish brown, never shortened, with large alula (Fig. 439). Telomere generally narrower (Fig. 441) . . . . . *S.* (*S.*) *clunipes* (MEIGEN)

— mt_2 longer and more slender (Fig. 455), distinctly longer than 2nd segment. Medial prescutellar *ac* pair slightly enlarged. Wing darker brown, more or less shortened, with smaller alula (Fig. 456). Telomere generally wider compared to periandrium (Fig. 445) . . . . . *S.* (*S.*) *manicata* (RICHARDS)

28(17) Postabdomen with posteroventrally protruding *S8* (Fig. 559) or distinctly shortened (Fig. 570). *S9* comparatively large (Fig. 560), spermathecae with characteristically grooved surface (Fig. 561) 29

— Postabdomen with simple *S8* with membraneous posterior part (margin) (Figs. 448, 514). *S9* usually shorter. Spermathecae with simple surface 30

29(28) *T9* with 4 long dorsal setae (Fig. 569). *S7* with small unpigmented posteromedial area, *S8* reduced (Fig. 571). Cerci wider . . . *S.* (*S.*) *simplicipes* (DUDA)

— *T9* with only 2 dorsal setae (Fig. 558). *S7* simply pigmented, *S8* not reduced, protruding posteroventrally. Cerci more slender . . . ***S. (S.) quaesita* spec. nov.**

30(28) *T1+2* with paler pigmented and with weakly sclerotized basal medial area (see Figs. 481, 503) 31

— *T1+2* simply pigmented and entirely heavily sclerotized 35

31(30) Cercus with short, slightly curved and thickened dorsopreapical seta (Figs. 466, 479), mt_2 usually shorter (ratio $t_2 : mt_2 = 1.89-2.09$) 32

— Cercus with long, fine and sinuate dorsopreapical hair (Figs. 447, 513), mt_2 usually longer (ratio $t_2 : mt_2 = 1.58-1.79$) 33

32(31) Wing greyish. *T9* with laterally situated dorsal setae (Fig. 465). *S9* larger (Fig. 467) . . . . . *S.* (*S.*) *baezi* (PAPP)

— Wing distinctly brown. *T9* with more medially situated dorsal setae (Fig. 478). *S9* shorter (Fig. 480) . . . . . *S.* (*S.*) *palmata* (RICHARDS)

33(31) Eye small, flat (Fig. 501), its diameter less than 1.8 times as long as the narrowest genal width. mt_2 with 4—6 short *av* spines (Fig. 500). ***S. (S.) talis* spec. nov.**

— Eye normal (Fig. 496), its diameter more than 2.4 times the narrowest genal width. mt_2 with at most 3 *av* spines (Fig. 498) 34

34(33) mt_2 regularly with 2—3 small *av* spines (Fig. 498). Arista short ciliate. *S8* smaller . . . . . *S.* (*S.*) *talparum* (RICHARDS)

— mt_2 without short *av* spines. Arista distinctly longer ciliate. *S8* larger . . . . . *S.* (*S.*) *czizeki* (DUDA)

35(30) mt_2 shorter and thicker, slightly longer than 2nd segment (Fig. 453). Medial prescutellar *ac* pair considerably enlarged. Wing paler greyish brown, never shortened, with large alula (Fig. 439) . . . . . *S.* (*S.*) *clunipes* (MEIGEN)

— mt_2 longer and more slender (Fig. 455). Medial prescutellar *ac* pair slightly enlarged. Wing darker brown, more or less shortened, with smaller alula (Fig. 456) . . . . . *S.* (*S.*) *manicata* (RICHARDS)

Subgenus ***Eulimosina*** **subgen. nov.**

Type species: *Borborus ochripes* MEIGEN, 1830

Diagnosis: The subgenus can be defined as follows.

(1) *pvt* distinct and crossing although hair-like
(2) 3—5 rather short *if* of equal length
(3) 2—4 *ads* inside and below *ors*
(4) *g* relatively short
(5) 2 *hu*, the internal very small
(6) 2 *dc*, both behind suture
(7) *ac* in 8 rows
(8) scutellum relatively long, with long *sc*
(9) 2 *stpl*, the anterior short, the posterior very long

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(10) t_2 chaetotaxy as in Figs. 420—422, *av* below middle of t_2 absent in both the sexes
(11) *C* not extending beyond R_{4+5}
(12) R_{4+5} straight
(13) discal cell of medium length but t_p rather short
(14) alula small but not pointed
(15) female postabdomen not narrower than preabdomen at 6th segment
(16) male *S5* with medial posterior keel (composed of cuticular tubercles)
(17) periandrium carrying a long dorsolateral hair
(18) male cerci reduced and fused with periandrium
(19) hypandrium relatively large
(20) telomere small, without micropubescence and without thick ventral spine
(21) phallophore compact, without epiphallus
(22) distiphallus very robust, apically enlarged
(23) postgonite long, slender, with some minute setulae in apical third
(24) ejaculatory apodeme present but minute
(25) female *T8* divided into 2 lateral plates
(26) female *T9* short, with a pair of dorsal bristles
(27) female *S8* large and wide, transversely oval
(28) female *S9* very short, band-shaped
(29) spectacles-shaped sclerite large, of complex form, with a long ventral tongue-shaped process
(30) spermathecae short, dish-shaped, with conically thickened bases of ducts
(31) female cerci short, with some hairs on apex.

Discussion: The subgenus *Eulimosina* subgen. nov. seems to be most closely related to the subgenus *Spelobia* s. str. and differs from it mainly by the absence of *av* below half of t_2 in both sexes, by reduced male cerci —fused with periandrium, small telomere without ventral spine and micropubescence, very large distiphallus with membraneous tuberculate apex, short female *S9* and by a unique spectacles-shaped sclerite of the female.

The most significant shared features of these subgenera are thought to be the similar venation, distinct *pvt*, dorsal chaetotaxy of t_2, male *S5* with medial keel or comb on posterior margin, long dorsolateral hair on periandrium, similarly haired female cerci, similar shape of spermathecae etc.

Eulimosina subgen. nov. includes only one species in Europe — *S.* (*E.*) *ochripes* (MEIGEN, 1830). Without study of the genitalia it is difficult to decide which other species might belong to this subgenus; perhaps *Leptocera* (*Limosina*) *lutea* RICHARDS, 1963 known from W. Caroline Is., Philippines and Nepal (RICHARDS, 1963a; DEEMING, 1969).

Spelobia (Eulimosina) ochripes (MEIGEN, 1830), **comb. nov.**

(Figs. 419—434)

Borborus ochripes MEIGEN, 1830: 209
Limosina ochripes: HALIDAY, 1836: 329; ZETTERSTEDT, 1847: 2495; 1860: 6406; STENHAMMAR, 1854: 400; RONDANI, 1880: 35; PAPP, 1973c: 57 (key)
Copromyza ochripes: ZETTERSTEDT, 1838: 771
Limosina (*Scotophilella*) *ochripes*: DUDA, 1918: 157
Leptocera (*Scotophilella*) *ochripes*: DUDA, 1925: 162 (key)
Leptocera (*Limosina*) *ochripes*: RICHARDS, 1930: 300
Leptocera ochripes: SÉGUY, 1934: 468; NARTSHUK, 1970: 346
Limosina (*Limosina*) *ochripes*: DUDA, 1938: 135
Limosina fulviceps RONDANI, 1880: 34
Limosina (*Scotophilella*) *fulviceps*: DUDA, 1918: 159
Leptocera (*Scotophilella*) *fulviceps*: DUDA, 1925: 162 (key)

Type material:
Borborus ochripes MEIGEN: Lectotype ♂ (des. by ROHÁČEK in 1978) labelled: „*ochripes*, Coll. WINTH." and „*ochripes*" (in MEIGEN's handwriting); paralectotypes 2 ♀ labelled: „*ochripes*, Coll. WINTH.", all specimens in good condition (NMW).
Limosina fulviceps RONDANI: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled „1950" (= a catalogue No. — red numeral on oval label) (MSF). This specimen is very probably that from Denmark (STAEGER leg.). The second specimen (from Bohemia, KOWARZ leg.) recorded by RONDANI (1880) is also deposited in MSF (not examined).

Material examined (besides „Type material"): 78 ♂ 85 ♀

Spain: 1 ♂ (JRO) — Grazalema nr. Ronda (ROHÁČEK leg.).

Czechoslovakia: 54 ♂ 55 ♀ (JRO, JZP, MMB, NMP, PFB, VUP, MHK, SMO) — Bohemia: Cheb, Františkovy Lázně (KOWARZ leg.), Zichovec nr. Slaný, Lešany nr. Benešov, Praha-Strašnice, Praha-Kunratice (KOVÁŘ leg.), Praha-Modřany (ZEMAN, ZUSKA leg.), Praha-Ruzyně (ŠKALOUDOVÁ leg.), Praha-Klánovice, Praha-Libuš (ZUSKA, REŠKA leg.), Chýně nr. Praha (ZUSKA leg.), Rakovník (BENEŠ leg.), Hořice (KNEIFL leg.), Rečkov (MOCEK leg.), Turnov (LAŠTOVKA leg.), Blatná

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(ZUSKA leg.); Moravia: Třešť, Mor. Krumlov, Pouzdřany, Pálava, Lednice (ROHÁČEK leg.), Pohořelice (MOCEK leg.), Brno-Černovice, Brno-Kr. Pole (CZIŽEK leg.), Brno-přehrada (LAUTERER leg.), Brno-Líšeň (ROHÁČEK leg.), Zábřeh (VALEŠOVÁ leg.), Chvalíkovice, Hnčvošice (distr. Opava), H. Jeseník-Skřítek, Keprník Mt. (ROHÁČEK leg.), Desná (valley) (CZIŽEK leg.); Slovakia: Slov. Raj-Kysel (ŠKALOUDOVÁ leg.), Tatranská Kotlina-Šarpanec (ROHÁČEK leg.).

Austria: 1 ♀ (IZI) — Tyrol: Obergurgl Mt. (TROGER leg.).

Bulgaria: 8 ♂ 11 ♀ (IZS, SMB) — Pirin Mts.-Banderica (MERTA leg.), Pirin Mts.-Breznitza, Drangovo-Petricka, Pirdop, Sofia-Bistritza, Vitoscha, Trojan-Shipkovo, Mirkovo, Strumeschnitza, Klissura, E. Rhodope-V. Sviratchi, Camp. Gergana-Harmanli, V. Strajitza (all BESHOVSKI leg.), Alibotush (NESTEROVA leg.).

Denmark: 15 ♂ 18 ♀ (ZMK) — SJ: Sønderborg, Madskov (WÜSTNEI leg.); EJ: Horsens, Randers (HANSEN leg.); WJ: Holstebro (HANSEN leg.); NEJ: Laesø (HANSEN leg.); NEZ: Lersø, Amager (STAEGER leg.), Dyrehaven (HANSEN leg.), Ordrup Mose, Ermelund, Furesø, Lyngby Mose (LUNDBECK leg.), Lundtofse (KRYGER leg.), Utterslev Mose (SCHLICK leg.), Freerslev Hegn (ZM exp. leg.).

Description:

Male. Total body length 1.78—2.18 mm, general colour brownish black, shiny. Head bright yellow, only occiput, ocellar triangle and antennae blackish brown. Sometimes also antennae yellowish brown to yellow — var. *fulviceps* RONDANI. 3—5 relatively short *if* of equal length. *pvt* distinct, apically crossing. Gena yellow, *g* small, somewhat longer than peristomal hairs. Antennae and arista rather shortly ciliate. Arista about 3 times as long as antenna. Eye diameter about 4 times the smallest genal width.

Thorax brownish black, mesonotum shiny despite some pollination, pleurae more dusted and duller. Mesonotal chaetotaxy as defined in the subgenus; scutellum triangular, rather long, with dense and fine microsculpture. Legs yellow, fore and hind tarsi, and t_1 usually at least partly darkened. t_2 slightly curved, its chaetotaxy as in Fig. 422, ventrally with a long row of short spines terminated by relatively short *va*. Similar row of short bristles also on ventral side of f_2·mt_2 with double ventral row of short, stout setulae. Ratio $t_2 : mt_2 = 1.70$ to 1.94. Wing (Fig. 423) very pale yellowish brown, with pale brown veins. R_{4+5} straight, not overpassed by *C*. Discal cell without distinct coloured processes of M_{1+2} and M_{3+4} beyond t_p. M_{1+2} reaching as a colourless fold almost to wing margin. Wing measurements: length 1.75—1.98 mm, width 0.67—0.83 mm, *C*-index = 0.89—1.18, $t_a - t_p : t_p = 2.33 - 3.00$. Alula small, narrow. Halteres yellow.

Abdomen brown to blackish brown, dorsally sparsely haired. *T1+2* with a medial pale pigmented area, terga medially pollinose, laterally bare and very shiny. Sterna pruinose, more densely and evenly haired. *S5* (Fig. 426) relatively simple, posteriorly with a medial keel consisting of 3 rows of small cuticular tubercles.

Genitalia. Periandrium (Figs. 427, 428) large, almost globular, with a small anal fissure, besides a longer dorsolateral hair, only shortly and sparsely haired. Hypandrium relatively robust. Cerci reduced and fused with periandrium. Telomere (Fig. 425) small, flat, very pale, with some longer bristles at upper and lower margin. Aedeagal complex (Fig. 424). Phallophore short, compact; distiphallus very large, with tuberculate membraneous apex. Postgonite slender, long, slightly bent, with some minute setulae in apical third. Ejaculatory apodeme of complex form but very small.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.78 to 2.46 mm. t_2 not curved, its bristles relatively longer, especially *va* (Figs. 420, 421). No *av* in apical half of t_2. Ratio $t_2 : mt_2 = 1.74 - 1.85$. Wing measurements: length 1.61—2.18 mm, width 0.71—0.91 mm, *C*-index = 0.97—1.15, $t_a - t_p : t_p = 2.28$ to 3.11. Abdomen pruinose as in male (Fig. 419), with exception of postabdomen.

Postabdomen (Figs. 429—431). *T6* and *T7* bare, smooth and strikingly shiny. *T8* divided into 2 lateral plates, each with an incision on posterior margin. *T9* short, transversely oval, with a pair of small dorsal bristles. *S8* rather large, oval, ventrally convex. *S9* short, band-shaped, with a pair of small hairs. In postabdomen a peculiar sclerite evidently homologous with the spectacles-shaped sclerite of other *Spelobia* but quite differently formed (Figs. 433, 434). The apex of the ventral, tongue-shaped part of this sclerite often protruding beyond *S8* and hence visible even without dissecting ventral portion of postabdomen. Spermathecae (Fig. 432) of shortly cylindrical form, with impressed tips and conical bases of spermathecal ducts. Cerci relatively short, with a longer sinuate apical hair and some shorter preapical hairs.

Discussion: The species is easily distinguishable from all other European *Spelobia* species by its almost entirely yellow head, in addition to the many peculiar features of the male and female terminalia.

Limosina fulviceps RONDANI, 1880 is, (after DUDA, 1938) considered as only a male colour variety of the above species. I have studied one syntype as well as some other specimens corresponding well with the original RONDANI's (1880) description of *L. fulviceps* and found them to be conspecific with the typical form. Among these specimens I have examined were 3 ♂ from Egger (= Cheb, Bohemia) collected by KOWARZ (NMP) which might belong to the same series as the second specimen on which RONDANI (1880) based his description (see "Type material").

Biology: A typical meadow species living under grass and cut sedge (RICHARDS, 1930; DUDA, 1938); it also occurs rarely in manure and excrement of domestic mammals, and is found by chance even on the carrion of larger animals (PAPP, 1973c). ZUSKA & LAŠTOVKA (1969) report its accidental occurrence in abattoirs and poultry farms. In meadows the species is rather common; adults are known to occur throughout the whole year, most frequently in IV and VIII—IX (combined data of some authors and the material examined).

Distribution: The species is widely distributed in the Holarctic Region. Besides many European countries (from Spain to Finland), there are also records from Tunisia (PAPP, 1978c), Soviet Central Asia (SHTAKELBERG, 1959; PAPP, 1974d, 1979a), Afghanistan (PAPP, 1976b, 1978a), Mongolia (PAPP, 1973a) and North America (USA — RICHARDS, 1965).

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Subgenus *Spelobia* s. str.

Leptocera (*Spelobia*) SPULER, 1924: 376, 1925a: 117 (part.)
Type species: *Limosina tenebrarum* ALDRICH, 1897 (orig. des.)

Diagnosis: The subgenus can be defined by the following features.
(1) *pvt* well developed, often 2 pairs (only posterior pair = true *pvt*)
(2) 3—6 (rarely 7) *if* of varying length in different species
(3) 2—8 minute *ads* inside and below *ors*
(4) *g* of short to medium length
(5) 2 *hu*, the internal small and as long as an anteroexternal additional microseta on humeral callus
(6) 2 *dc* (rarely 1 *dc* — in extra-European species), all postsutural
(7) *ac* microsetae in 6—10 rows in front of suture, the medial prescutellar *ac* pair more or less enlarged
(8) scutellum roundly triangular, usually long; *sc* long
(9) 2 *stpl*, the anterior small, posterior long
(10) t_2 chaetotaxy rich, *av* below middle rarely absent (in extra-European species only); male t_1 sometimes clavate and anteriorly incised
(11) *C* not (or indistinctly) extended beyond R_{4+5}
(12) R_{4+5} straight, rarely very slightly apically curved or slightly sinuate
(13) discal cell of medium to short length, with processes of M_{1+2} and M_{3+4} beyond t_p; in brachypterous forms discal cell often with rounded posterior outer corner or even t_p absent
(14) alula large though sometimes narrow, and more or less rounded
(15) female postabdomen not appreciably narrower the preabdomen at 6th segment and short
(16) male *S5* with posteromedial comb of spines, rarely fusing in a simple lamella (*S. nana*)
(17) periandrium with a long dorsolateral hair-like bristle and usually also with a shorter laterocaudal hair (both absent only in *S. villosa*)
(18) male cerci simple, not reduced, normally each with a longer seta
(19) hypandrium of medium length and rather robust
(20) telomere broad and short, with micropubescence on outer side, peculiar ventral robust spine and long setiform hairs on posterior part
(21) phallophore compact, robust and comparatively large
(22) distiphallus well sclerotized, more simple in structure than in subgen. *Eulimosina* and *Bifronsina*, with characteristic dorsopreapical projection
(23) postgonite long, slender, more or less distinctly S-shaped, with some minute setulae on outer side
(24) ejaculatory apodeme often present but small
(25) female *T6* and *T7* simple. *T8* often dorsomedially shortened, weakly sclerotized or divided into lateral plates
(26) female *T9* roughly triangular, rather short, with 2 or more dorsal setulae
(27) female *S6* and *S7* simple
(28) female *S8* tapering posteriorly but rather short and transverse, often with membraneous posterior margin or protruding posteroventrally and carrying 2 or more longer hairs
(29) female *S9* transversely oblong to short, band-like
(30) spectacles-shaped sclerite well developed although often with weakly sclerotized medial part
(31) spermathecae usually tyre-shaped, rarely cylindrical (*S. parapusio*, *S. cambrica*)
(32) female cerci generally short and robust, sinuate haired.

Discussion: The subgenus *Spelobia* s. str. is characterized mainly by the wing having a large alula, at most 2 *dc*, usually with *av* below middle of t_2, telomere of characteristic short but broad form with robust ventral spine, aedeagal complex with comparatively simple and generally similar construction of distiphallus and rather large, compact phallophore, by simple spectacles-shaped sclerite and absence of additional sclerites behind *S8*

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(at most single small sclerite in *S. nana*). Some of these features are undoubtedly autapomorphic and demonstrate the monophylety of the subgenus (see chapter "Phylogeny") which seems to be most closely related to *Bifronsina* subgen. nov. and hence placed as its sister-group in the cladogram (Fig. 64).

The subgenus is the richest in species in the previous genus *Limosina*. It contains 41 species in the Palaearctic of which 22 have been found in Europe, viz. *S. clunipes* (MEIGEN, 1830), *S. manicata* (RICHARDS, 1927), *S. faeroensis* (DEEMING, 1966), *S. baezi* (PAPP, 1977), *S. palmata* (RICHARDS, 1927), *S. talparum* (RICHARDS, 1927), *S. talis* spec. nov., *S. czizeki* (DUDA, 1918), *S. pseudonivalis* (DAHL, 1909), *S. villosa* (DUDA, 1918), *S. quaesita* spec. nov., *S. simplicipes* (DUDA, 1925), *S. pseudosetaria* (DUDA, 1918), *S. rufilabris* (STENHAMMAR, 1854), *S. ibrida* spec. nov., *S. luteilabris* (RONDANI, 1880), *S. ulla* spec. nov., *S. nana* (RONDANI, 1880), *S. parapusio* (DAHL, 1909), *S. belanica* spec. nov., *S. pappi* spec. nov. and *S. cambrica* (RICHARDS, 1929).

The following species (all comb. nov.) were described by PAPP (1973a) from Mongolia: *S. glabrocercata* (PAPP, 1973), *S. paraczizeki* (PAPP, 1973), *S. paratalparum* (PAPP, 1973), *S. setilaterata* (PAPP, 1973), *S. spinifemorata* (PAPP, 1973), *S. bruneiptera* (PAPP, 1973), *S. eclecta* (PAPP, 1973), *S. lineatarsata* (PAPP, 1973), *S. paralineatarsata* (PAPP, 1973), *S. parapenetralis* (PAPP, 1973), *S. pseudoluteilabris* (PAPP, 1973), *S. pseudosetitarsalis* (PAPP, 1973), *S. setitarsalis* (PAPP, 1973), *S. divergens* (PAPP, 1973), *S. duplisetaria* (PAPP, 1973) and *S. interima* (PAPP, 1973). *S. macrosetitarsalis* (PAPP, 1974) comb. nov. was also described from Mongolia, *S. ghaznavi* (PAPP, 1978) comb. nov. from Afghanistan and *S. dudai* (PAPP, 1978) comb. nov. from Afghanistan and Sumatra.

A further 8 species from North America undoubtedly belong to the subgen. *Spelobia* s. str. (all comb. nov.), viz. *S. tenebrarum* (ALDRICH, 1897), *S. lucifuga* (SPULER, 1925), *S. semioculata* (RICHARDS, 1964), *S. typhlops* (RICHARDS, 1964), *S. abundans* (SPULER, 1925), *S. ordinaria* (SPULER, 1925), *S. curtipennis* (SPULER, 1925), *S. occidentalis* (ADAMS, 1904) and probably also *Leptocera* (*Scotophilella*) *carinata* SPULER, 1925. In addition, *S. mediospinosa* (DUDA, 1925) comb. nov. from Transvaal, Australia and Chile and *S. plumbea* (DUDA, 1925) comb. nov. from Peru and Bolivia are referable to this subgenus.

Spelobia (Spelobia) clunipes (MEIGEN, 1830), **comb. nov.**

(Figs. 35–37, 51–54, 435, 437, 439–444, 446–453)

Borborus clunipes MEIGEN, 1830: 208
Limosina (*Limosina*) *clunipes*: DUDA, 1938: 115
Leptocera clunipes: NARTSHUK, 1970: 350 (key)
Limosina (*Scotophilella*) *crassimana* var. *clunipes*: DUDA, 1918: 170
Limosina crassimana HALIDAY, 1836: 328; STENHAMMAR, 1854: 376; RONDANI, 1880: 30; RICHARDS, 1927: 35; PAPP, 1973c: 58 (key)
Limosina (*Scotophilella*) *crassimana*: DUDA, 1918: 167
Leptocera (*Scotophilella*) *crassimana*: SPULER, 1925b: 157; DUDA, 1925: 163 (key)
Leptocera (*Limosina*) *crassimana*: RICHARDS, 1930: 301
Leptocera crassimana: SÉGUY, 1934: 465
Copromyza pygmaea ZETTERSTEDT, 1838: 771
Limosina pygmaea: ZETTERSTEDT, 1847: 2503, 1860: 6415 nec MEIGEN, 1838
Limosina nigrinervis DAHL, 1909: 374
Limosina glabra: DAHL, 1909: 373 nec MEIGEN, 1838
Limosina tristis: DAHL, 1909: 374 nec MEIGEN, 1838

Type material:
Borborus clunipes MEIGEN: Lectotype ♂ (des. by ROHÁČEK in 1979), labelled: "*clunipes* Coll. WINTH." The specimen is in very good condition though rather immature. The fore margin of its frons is yellow and the facial cavity yellowish brown which corresponds well with the original description (NMW).
Limosina crassimana HALIDAY: Lectotype ♂ (des. by ROHÁČEK in 1979), labelled: "Ireland" (green label), "HALIDAY 20. 2. '82" (registration number of museum) and "Named by J. E. COLLIN"; Paralectotypes: 2 ♂ 2 ♀ labelled as the lectotype; 2 ♀ labelled: "British", "HALIDAY, 20. 2. '82" and "Named by J. E. COLLIN"; all specimens in quite good condition (NMI).
Copromyza pygmaea ZETTERSTEDT: In the "Insecta Lapponica" collection (ZIL) there are 5 specimens considered syntypes (KIM, 1972). However, I have examined this material and doubt if these specimens are really syntypes as they are labelled as "*L. pygmaea*". ZETTERSTEDT (1838) had not known the paper of MACQUART (1835) in which the genus *Limosina* had been erected and described his species as *Copromyza pygmaea*. Moreover the 4 specimens originate from different localities than those given in the original description. To complete this, of these 5 specimens (all identified by ZETTERSTEDT) 1 ♂ (from Tärna) is *Minilimosina vitripennis*, 1 ♀ (Tärna) *Spelobia nana*, 1 ♀ (Tärna) *S. clunipes*, 1 ♀ (Thynaes) *S. clunipes* and 1 ♀ (Stensele) *S. pseudosetaria*. Therefore no lectotype has been designated from this material and the synonymy is accepted according to ZETTERSTEDT (1860) and DUDA (1918, 1938).
Limosina nigrinervis DAHL: Holotype ♀ labelled: "Zool. Mus. Berlin, F.: Plagesee, Lichv. . . ., Buchenw., 20. 4. 08, S.: DAHL 1656, J. N., E. K. N." The specimen is in very bad condition and faded (preserved in alcohol); its left wing, fore right, both mid and hind legs and postabdomen on a slide, labelled: "*Limosina nigrinervis* F. DAHL" and "DAHL 1656" (ZMB, examined).

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Material examined (besides "Type material"): 936 ♂ 1123 ♀

Spain: 37 ♂ 33 ♀ (JRO) — Sierra Nevada Mts.-Llano Prado, Güejar Sierra nr. Granada (ROHÁČEK leg.).

Belgium: 2 ♀ (IRB) — Malmédy-Pouhon des Cuves (COLLART leg.).

Czechoslovakia: 824 ♂ 993 ♀ (JRO, JZP, MMB, NMP, PFB, SMO, MHK, VUP) — Bohemia: Cheb, F. Lázně (KOWARZ leg.), Čistá nr. Sokolov (DLABOLA leg.), Přebuz nr. K. Vary (ŠKALOUDOVÁ leg.), Děčínský Sněžníky (OŠMERA leg.), Doupovské hory Mts.-Doupov, Lochotín, Nečemice nr. Rakovník (ROHÁČEK leg.), Bečov nr. Most (JEŽEK leg.), Jilemnice (DLABOLA leg.), Krkonoše Mts.-Rezek, Kotelné Jámy (ZUSKA leg.), Zichovec nr. Slaný, Lešany nr. Benešov, Praha-Strašnice (KOVÁŘ leg.), Praha-Ruzyně (ZUSKOVÁ leg.), Praha-Jinonice (PECINA leg.), Praha-Cibulka, Závist nr. Praha, Toušeň nr. Čelákovice, Štěchovice (VIMMER leg.), Konětprusy, Dobřichovice, Kundratice nr. Litoměřice (ZUSKA leg.), Nymburk, Poděbrady (JEŽEK leg.), Hořice, Harrachov (KNEIFL leg.), Medník nr. Davle (ČERNOCH leg.), Dobříš (LAŠTOVKA leg.), Vysoké Mýto (LAŠTOVKA leg.), Horní Blatná (ŠKALOUDOVÁ leg.), Palupín nr. Strmilov, Dačice (ROHÁČEK leg.), Opočno, Choltice, Uhersko, Prach. skály (MOCEK leg.); Moravia: Třešť, Řásná nr. Telč, Brno-Líšeň, Brno-Soběšice, Brno-Ledná, Mor. Kras — Babice, Těchov, Adamov, Holštýn (ROHÁČEK leg.), Brno-Kr. Pole, Komárov, Černovice, Mor. Kras-Výpustek (CZIŽEK leg.), Olomouc (LAUTERER leg.), Lednice (VAŇHARA leg.), Pálava, Hradec n. M., Brumovice, Hněvošice, Klokočov, H. Jeseník-Skřítek, Rejvíz, Vsetínské vrchy-Cáb, Karolinka (ROHÁČEK leg.), Komorní Lhotka (HETSCHKO leg.) and localities given by ROHÁČEK (1980); Slovakia: Javorníky Mts., Kremnické poh. Mts.-Turček, Lubochňa, Terchová, Liptovské Revúce, V. Fatra-Šiprúň, Krížná Mt., Suchá dolina (valley), Krásný kopec Mt., Rakytov Mt., N. Tatry Mts.-Demänovská dolina, Vyšná Boca, Slov. Raj-Lipovec, Velký Sokol, Patince nr. Komárno, Zadiel, Silická ladnica, Kečovo, Vihorlat Mts., Belanské Tatry Mts.-Monkova dolina, Predné Jatky, Zadné Medodoly, Široké sedlo, Tatranská Kotlina (ROHÁČEK leg.), Blatné Remety, Blatná Polianka (BENEŠ leg.), Kr. Chlmec (LAŠTOVKA leg.).

Austria: 20 ♂ 26 ♀ (IZI) — Tyrol: Obergurgl Mt., Hohe Tauern-Badgastein (TROGER, STOCKNER leg.).

Italy: 3 ♂ 1 ♀ (MCV) — Prealpi Venete Mts.-Visentin, Bus de Valon-Lessimi (PAOLETTI leg.).

Roumania: 1 ♂ 1 ♀ (JRO) — Transylv. Alpen (STROBL leg.).

Bulgaria: 5 ♂ 16 ♀ (IZS, SMB) — Pirin Mts.-Papaz (MERTA leg.), Drangovo-Petritsch, E. Rhodope Mts.-Zlatograd, Ostravetz-Kardjali, V. Strandjevo-Arda, V. Sviratchi-Ivailovgrad, Strandja-Tarnovo, Strandja-Sinemorez, Strandja-Izgrev, Sandanski, Camp. Gergana, Harmanli, Vasilaschki cz., Pamporovo, Burgas, Topolniza, S. Mesto, Varna (BESHOVSKI leg.), Pest. Neprivetlivata (cave)-Belogradschik (BERON leg.).

Denmark: 45 ♂ 58 ♀ (ZMK) — SJ: Skelde (WÜSTNEI leg.), Draved skov (O. M. & P. J. leg.); EJ: Horsens, Gjerlev, Hald, Nebsager (HANSEN leg.); WJ: Tipperne (BUCH leg.); NWJ: Hansted res. (Z. M. exp.); NEJ: Frederikshavn (HANSEN leg.), Skørping (LUNDBECK leg.), Løkken (MORTENSEN leg.), Hadsund (BUCH leg.); F: Saeballe skov (MARTIN leg.), Veflinge (HANSEN leg.); LFM: Nysted (LUNDBECK leg.); SZ: Sorø (LUNDBECK leg.), Skaelskør (HANSEN leg.); NEZ: Lersø (STAEGER leg.), Dyrehavn (HANSEN leg.), Utterslev Mose (SCHLICK leg.), Ordrup Mose, Hillerød, Holte, Furesø, Ermelund (LUNDBECK leg.), Geel Skov (MORTENSEN leg.), Bagsvaerd, Brordrup (LYNEBORG leg.), St. Hareskov (OVERGÅRD leg.), Farum (BUCH leg.); B: Rø, Haste (HANSEN leg.), Balka (MORTENSEN leg.), Blykobbe, Hammersholm, Laeså (O. M. & B. V. P. leg.).

Sweden: 2 ♀ (ZIL) — Ly. Lpm.: Tärna, Thynaes (ZETTERSTEDT leg.).

Finland: 1 ♂ 1 ♀ (ZMH) — N: Helsinki (TUOMIKOSKI leg.); Le: Kilpisjärvi (FREY leg.).

Description:

Male (Fig. 435). Total body length 1.51—2.18 mm, general colour brownish black, dark brownish grey dusted, subshining. Head brownish black. Frons usually with pale brown to reddish brown anterior margin, otherwise brownish black. Frontal triangle long, narrow, shiny black; interfrontalia and orbits somewhat silvery grey dusted and glittering, stripes between interfrontalia and frontal triangle black and dull. Rest of frons, ocellar triangle and occiput greyish brown pollinose. *pvt* well developed and also the second (anterior) false pair of *pvt* present. 4—5 *if*, the most anterior usually much smaller than others. 5—8 comparatively well developed *ads* inside and below *ors*. Frontal lunule brown, face and anterior part of gena (vibrissal angle) often reddish brown, facial cavity and rest of gena brown to brownish black (rarely pale brown). *g* rather small, not longer than peristomal setae. Eye normal, its diameter about 3.6—3.8 times the narrowest genal width. Antennae blackish brown to black, basal segment often brown. Arista about 3.4 times as long as antenna and relatively long ciliate.

Thorax brownish black, greyish brown dusted. Mesonotum despite pollination shiny, pleurae a little duller. 2 *hu*, the internal only as long as an additional anteroexternal seta on humeral callus. 2 *dc*, the anterior comparatively short. 8—10 rows of *ac* microsetae between anterior *dc*, the medial prescutellar *ac* pair distinctly enlarged, usually as long as the anterior *dc* (the length of this pair of *ac* varies from longer than anterior *dc* to about half their length). Scutellum elongate, rounded triangular, with fine transverse microsculpture; *sc* long. Pleurae with paler yellowish brown sutures between sclerites. 2 *stpl*, the anterior small and thin. Legs brownish black, fore coxa, trochanters and knees paler to yellowish brown, also mid tarsus often paler brown. t_1 incrassate, with anterior incision (Fig. 437) provided with numerous specialized attaching setae (Figs. 36, 37). Fore tarsus strikingly dilated and flattened. t_2 chaetotaxy (Figs. 452, 453). mt_2 comparatively short, a little longer than 2nd tarsal segment, with rows of rather stout *av* and *pv* spines (Fig. 453). Ratio $t_2 : mt_2 = 2.12—2.32$. Wing (Fig. 439) with pale brownish grey membrane, veins pale brown, *C* darker, not overpassing R_{4+5}. R_{4+5} straight. Discal cell of medium length, with short but distinct and pigmented appendages of M_{1+2} and M_{3+4} beyond t_p, that of M_{1+2} continued by colourless fold parallel to R_{4+5}. Alula large, very wide and rounded. Wing measurements: length 1.51—2.03 mm, width 0.65—0.91 mm, *C*-index = 1.12—1.42, $t_a—t_p : t_p = 1.90—2.62$. Halteres yellowish to yellowish brown, knob darker, brown and often with greyish pollination.

Abdomen brownish black, greyish brown dusted. Terga sparsely and relatively shortly haired. Sterna a little more densely haired. *T1+2* simply pigmented and completely heavily sclerotized. *S5* (Fig. 444) with posteromedial comb of simple spines arranged in 2 rows and with thin but hook-like curved bristles on disc; pigmentation as in Fig. 444.

Genitalia. Periandrium (Figs. 442, 443) with very long dorsolateral and laterocaudal bristle, also 1 lateral bristle distinctly longer than other setae. Cerci similar to those of other *Spelobia* (s. str.), each with a long caudal hair-like bristle and some minute setulae. Hypandrium of medium length, rather robust. Telomere (Fig. 441) widened, with tapered anterior part, short and relatively thin ventral spine, extensive micropubescence on outer side and comparatively short setiform hairs on posterior part. Aedeagal complex (Fig. 440) with robust phallophore; distiphallus of usual *Spelobia* (s. str.) type, its dorsopreapical projection with some dorsal tubercles. Postgonite slender, S-shaped, somewhat pointed apically and with some minute setulae on outer side. Ejaculatory apodeme present, small.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.59 to 2.50 mm. t_1 simple, slender. Fore tarsus less dilated (but more than e.g. in *S. simplicipes*) and flattened. Ratio $t_2 : mt_2 = 2.10—2.25$. Wing measurements: length 1.63—2.50, width 0.71—1.03 mm, *C*-index = 1.12—1.36, $t_a—t_p : t_p = 2.13—269$.

Postabdomen (Figs. 446—448). *T6* simple. *T7* laterally somewhat extended. *T8* dorsomedially shortened but simply sclerotized and not divided, laterally strongly enlarged. *T9* shortly triangular, with 2 rather long dorsal setae. *S6* and *S7* simple, densely shortly setulose. *S8* with usual membraneous posterior margin and 2 long ventral setae. *S9* comparatively short, anteromedially with small, pale pigmented area, posteromedially with a pair of longer setae. Spectacles-shaped sclerite rather membraneous (Figs. 450, 451), circles broader than in *S. palmata* or *S. baezi*. Spermathecae (Fig. 449) tyre-shaped, with conically thickened terminal parts of ducts and with internal sac protrusible through large aperture in tip. Cerci rather robust (much broader than in *S. palmata* or *S. baezi*), with long apical and dorsopreapical sinuate hair; also ventropreapical slightly curved hair comparatively long.

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Preimaginal stages: Puparium was described and illustrated by GODDARD (1938: 244, Fig. 5). It closely resembles those of related species (*S. manicata*, *S. palmata*, *S. talparum*, *S. pseudonivalis*) so that it is impossible to identify it with certainty (OKELY, 1974).

Discussion: This species forms with *S. manicata* (RICHARDS) and *S. faeroensis* (DEEMING) a species-group of very closely allied species, characterized by almost identical formation of male and female terminalia. If we accept the supposition that these 3 taxa are really separate species (as presented here) then *S. faeroensis* may be considered as an ancestral species becoming extinct now, *S. clunipes* as its more successful and progressive sister-species and *S. manicata* as "young", recently evolved species derived from *S. clunipes* (synapomorphic thickened male t_1) and specialized for subterraneous habitats (see discussion under *S. faeroensis* and *S. manicata*).

There is however, a second possibility. *S. faeroensis* may only be atavistic males with simple (plesiomorphic) t_1 and *S. manicata* may be an ecomorph or f. brach. of *S. clunipes*, not deserving specific rank. The latter possibility is not accepted here because it is not demonstrable without crossing experiments and other taxonomic methods.

S. clunipes differs from *S. faeroensis* by the clavate male t_1 and dilated fore tarsi; from *S. manicata* by the fully developed wing, shorter mt_2 and long medial prescutellar *ac*. The minute differences in telomere and the aedeagal complex are of little practical use because of difficulties with the orientation of them during examination. The hitherto unknown female of *S. faeroensis* is probably not morphologically distinguishable from *S. clunipes*.

The previously established synonymies of *S. clunipes* (MEIGEN) were mostly confirmed by the study of type material and designation of lectotypes (see "Type material").

Biology: *S. clunipes* is one of the most common and ubiquitous species of the subfamily Limosininae. It has very wide ecological preferences and occurs in a large variety of habitats — on decaying vegetation, manure, various kinds of excrement, in nests and runs of small mammals, in caves; rarely on decaying fungi, carrion and also flowering Daucaceae (RICHARDS, 1930; COE, 1962b; LYNEBORG, 1968; PAPP, 1973c). Larvae are apparently polysaprophagous and develop successfully in excrement (breeding records: HAMMER, 1941; LAURENCE, 1955), decaying vegetation (breeding records: RICHARDS, 1930; GODDARD, 1938) or decaying animal matter (breeding record from egg-mass of *Succinea* snails — DEEMING & KNUTSON, 1964).

HAMMER (1941) found that the female laid single eggs in excrement and covered them by its excrement. Duration of the larval stage is unknown but the whole life-history lasted 18—100 days under natural circumstances, dependent on mean temperature during development (LAURENCE, 1955). The puparium is usually formed in soil near the excrement (HAMMER, 1941) or directly in the feeding substrate (decaying vegetation — GODDARD, 1938). The species is polyvoltine; it has some 5—6 generations yearly (cf. Fig. 55). Adults occur during the whole year.

S. clunipes often forms synanthropic populations, either symbovilous on manure and droppings on pasture lands (HAMMER, 1941; LAURENCE, 1955; PAPP, 1974b, 1975a, 1976b) or hemisynanthropic on compost and refuse heaps or in various food-processing plants (abattoirs, poultry farms — ZUSKA & LAŠTOVKA, 1969).

Distribution: The species was originally probably Holarctic in distribution but now tends to be cosmopolitan. It occurs over the whole of Europe (from Spain to Lapland and Iceland). Extra-European records: Azores (HACKMAN, 1960), Soviet Central Asia (SHTACKELBERG, 1956; PAPP, 1979a), Afghanistan (PAPP, 1978a), Mongolia (PAPP, 1973a), Far East (PETROVA, 1968), USA (SPULER, 1925b; RICHARDS, 1965). There are also some records from Africa (DUDA, 1925 — Madagascar; DUDA, 1938 — Ethiopia) but I agree with PAPP (1978a) that they need revision.

Spelobia (Spelobia) manicata (RICHARDS, 1927), **comb. nov.**

(Figs. 445, 454—456)

Limosina manicata RICHARDS, 1927: 36; PAPP, 1973c: 60 (key)
Leptocera (*Limosina*) *manicata*: RICHARDS, 1930: 302

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Limosina (*Limosina*) *manicata*: DUDA, 1938: 131
Leptocera manicata: NARTSHUK, 1970: 350 (key)

Type material: Lectotype ♂ (des. by ROHÁČEK in 1980) labelled: "Hogley 28. 4. 17 horse dung", "*manicata* ♂" (RICHARDS' handwriting) and "ex coll. A. H. HAMM d. d. 1942"; Paralectotypes: 1 ♂ 1 ♀ (glued together on a card) labelled: "Stow Wood 17. 4. 1922 J. C.", "from mouse nest" and "*Limosina manicata* COLLINS det. COLLINS 1923"; 1 ♀ labelled: "Hogley 8. 5. 15" and "sp. B. ♀"; 1 ♀ labelled "Hogley 17. 10. 14", "B. 2 ♀" and "*Limosina* sp. near *crassimana* t. J. E. COLLIN"; 1 ♀ labelled: "Shotover 23. 10. 20", "Sp. B 3 ♀"; 1 ♀ labelled: "Henwood 3. 4. 15 pigeon", "*Limosina* sp. near *crassimana* t. J. E. COLLIN",,,B. 1 ♀"; 1 ♀ with same labels but collected 5. 4. 15; 1 ♂ labelled: "*manicata* ♂ mouse run. Bagley Wd. 1/2/26", "14015", "1927 12", "Mouse run. 1. Feb. 1926. Nr. Oxford, Bagley Wd. dd. 1927 O. W. RICHARDS"; 1 ♀ labelled: *manicata* ♀ mouse run. Bagley Wd. 15. 2. 26", "14083", "1927 13", "Mouse run. 15. Feb. 1926 Nr. Oxford, Bagley Wd. dd. 1927 O. W. RICHARDS" (UMO). Some other specimens belonging to type series are deposited in BML (not examined).

Material examined (besides "Type material"): 67 ♂ 71 ♀

Czechoslovakia: 67 ♂ 70 ♀ (JRO, SMO, TMB) — Bohemia: Doupovské hory Mts.-Doupov (ROHÁČEK leg.); Moravia: Třešť, Řásná nr. Telč, Mor. Kras-Adamov, Vršovice nr. Opava, Klokočov, H. Jeseník-Skřítek, Rejvíz, Kouty n. D., Velká Kotlina (valley) (ROHÁČEK leg.) and localities given by ROHÁČEK (1980); Slovakia: V. Tatry Mts.-Mengusovská dolina, Batizovská dolina, Belanské Tatry Mts.-Šarpanec (ROHÁČEK leg.).

Austria: 1 ♀ (IZI) — Hohe Tauern Mts.-Badgastein (TROGER leg.).

Description:

Male. Total body length 1.59—2.11 mm, general colour blackish brown, dark greyish brown dusted, subshining. Head colouring as in *S. clunipes*. 2 pairs of *pvt*, 4 *if* (the most anterior small) and 5—7 small *ads* present. Facial cavity, face and gena generally paler than in *S. clunipes*. Eye usually larger than that of *S. clunipes*, its diameter about 3.9—4.3 times the narrowest genal width. Arista about 3.8 times as long as antenna, rather long ciliate (as long as that of *S. clunipes*).

Thorax as in *S. clunipes*, blackish brown, mesonotum rather shiny, pleurae duller. 2 *hu* as usual; 2 *dc*, the anterior short; 8 rows of *ac* hairs between anterior *dc*. In contrast to *S. clunipes* the medial prescutellar *ac* pair short, only slightly enlarged, usually shorter than half length of anterior *dc*. Legs as in *S. clunipes* with thickened t_1 and dilated fore tarsus but mt_2 longer, distinctly longer than 2nd tarsal segment (cf. Fig. 455). Ratio $t_2 : mt_2 = 1.88—2.08$. Wing more or less distinctly shortened (Fig. 456) and with darker brown membrane. *C* not extended beyond R_{4+5}; R_{4+5} more or less straight. Discal cell rather short and its posterior outer corner often rounded. Alula distinctly smaller than in *S. clunipes*, despite this broad and rounded. Wing measurements: length 1.27—1.62 mm, width 0.55—0.73 mm, *C*-index = 0.98—1.29, $t_a—t_p : t_p = 1.62$ to 2.50. Halteres yellow with brownish knob.

Abdomen as in *S. clunipes*, shortly sparsely haired and with simply pigmented and heavily sclerotized *T1+2*. *S5* not differing from that of *S. clunipes*.

Genitalia quite similar to those of *S. clunipes* but telomere (Fig. 445) of longer mean width. Ventral spine of telomere small. No differences were found in the aedeagal complex.

Female. Similar to male but differs as follows. Total body length 1.62—2.22 mm. t_1 simple and slender, fore tarsus less dilated. Ratio $t_2 : mt_2 = 1.93—2.06$. Wing often more or less distinctly shortened as in male (thus not always normal as RICHARDS, 1927 suggested). Wing measurements: length 1.38—1.83 mm, width 0.61—0.81 mm, *C*-index = 1.01—1.30, $t_a—t_p : t_p = 1.64—2.60$. Postabdomen, spectacles-shaped sclerite and spermathecae not distinguishable from those of *S. clunipes*.

Preimaginal stages: GODDARD (1938: 246, Fig. 7) described and illustrated the puparium which is very similar to hose of *S. clunipes* and other related species, and according to OKELY (1974) it cannot be safely distinguished from them.

Discussion: The species is very closely related to *S. clunipes* (MEIGEN) having almost identical structure of the male and female terminalia. I am inclined to consider this species as only an ecomorph (an early stage of speciation) of *S. clunipes* tending to the subterraneous life-habit because the only differences from *S. clunipes*, viz. shortened and darker wing, short prescutellar *ac*, slightly prolonged arista and legs, may all be ascribed to adaptation for it. Therefore I have previously classified *S. manicata* as only brachypterous form of *S. clunipes* (ROHÁČEK, 1980). However, it is necessary to prove this theory by crossing experiments because it is quite possible that *S. manicata* is already reproductively isolated from *S. clunipes* (by barriers other than morphological ones) and hence a distinct though newly evolved species. For this reason I propose to retain *S. manicata* as a separate species for the present.

Biology: Not a very rare but a hitherto little known species preferring burrows of various small mammals (RICHARDS, 1927, 1930, 1951; HACKMAN, 1967a). It is probably polysaprophagous as is *S. clunipes*. I have also collected it regularly by sifting leaf litter, decayed moss and grass and in numbers by the soil trap method (ROHÁČEK, 1980). Occassionally it can also be found on dung or carrion (RICHARDS, 1930). *S. manicata* seems to prefer higher altitudes because I have no record from the lowlands of Czechoslovakia. GODDARD (1938) bred some specimens from larvae and puparia he found in burrows of rodents and determined the duration of the puparium stage to be 6—14 days. Adults occur throughout the whole year (combined data of RICHARDS, 1930 and material examined).

Distribution: Very poorly known. Hitherto recorded only from Central Europe in broader sense — GB: England, Wales, Scotland (RICHARDS, 1927, 1930, 1976; GODDARD, 1938), South Sweden (HACKMAN, 1967a), Czechoslovakia (PAPP, 1973c; ROHÁČEK, 1980), Austria (material examined, new), Hungary (PAPP, 1973c).

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Spelobia (Spelobia) faeroensis (DEEMING, 1966), **comb. nov.**

(Figs. 436, 438, 457–460)

Leptocera (Limosina) faeroensis DEEMING, 1966: 279

Type material: Holotype ♂: Faeroe Islands, Bordö, 12. 10. 1925, LEMCHE leg. Genitalia dissected and preserved in a glass microvial pinned below specimen (ZMK, examined).

Material examined (besides "Type material"): 3 ♂

Czechoslovakia: 3 ♂ (JRO) – Slovakia: Slov. Kras-Kečovo, Plešivecká planina (ROHÁČEK leg.).

Description:

Male. Total body length 2.00–2.35 mm, general colour blackish brown. Head blackish brown, dull. Frons anteriorly pale brown, posteriorly dark, almost black, dusted and dull; only the frontal triangle shiny. Interfrontalia rather indistinct. *pvt* well developed, in 2 pairs. 4 *if*, the most anterior short and weak. 4–6 small *ads* inside and below *ors*. Frontal lunule pale brown, brownish yellow dusted; facial cavity brown and subshining; gena brown and dull. *g* of medium length, peristomal hairs well developed. Eye not very large, its diameter about 2.8 times the smallest genal width. Antennae brownish black; arista about 3.5 times as long as antenna, medium to rather long ciliate.

Thorax blackish brown, brown dusted. Mesonotum more shiny than dull pleurae. 2 *hu*, the internal small. 2 *dc*, the anterior short. 8–10 rows of *ac* hairs; prescutellar medial *ac* pair very long, longer than anterior *dc*. Scutellum roundly triangular, *sc* long. 2 *stpl*, the anterior short. Legs brown. t_1 (Fig. 436) slender, simple, not incised or impressed anteriorly. Fore tarsus also slender, not dilated and slightly flattened. t_2 chaetotaxy as in *S. clunipes*. mt_2 with a row of *av* and *pv* short, stout setulae. t_3 distinctly though slightly curved (Fig. 438). Ratio t_2: mt_2 = 1.93–2.20.

Wing (Fig. 457) very pale greyish brown, veins brown. *C* not extended beyond R_{4+5}. R_{4+5} straight but apically very slightly bent to *C*. Discal cell of medium length, with short processes of M_{1+2} and M_{3+4} beyond t_p. Alula very broad and rounded, as in *S. clunipes*. Wing measurements: length 1.80–1.90 mm, width 0.78–0.83 mm, *C*-index = 1.32–1.45, t_a–t_p: t_p = 2.60–2.80. Halteres greyish white, knob greyish brown.

Abdomen brown to blackish brown, subshining. Terga sparsely, sterna more densely shortly haired. *T1+2* without any weakly sclerotized or pale pigmented area. *S5* (Fig. 458) very similar to that of *S. clunipes*, with double and short comb of spines posteromedially, hook-like curved inclinate thin setae in the middle and pigmentation as figured but the spines in posteromedial comb rather blunter.

Genitalia. Periandrium comparatively small, as in *S. clunipes*, with a long dorsolateral hair-like bristle, somewhat shorter laterocaudal and short lateral bristle besides the normal setosity. Cerci as in *S. clunipes*, each with a longer caudal hair and some minute setulae. Hypandrium of medium length. Telomere (Fig. 459) also similar to that of *S. clunipes*, with micropubescence on almost entire outer side but with somewhat longer ventral setae on anterior tapered part and ventral spine smaller than in *S. clunipes* or *S. manicata*. Aedeagal complex (Fig. 460) extremely similar to that of *S. clunipes*, some slight differences (? constant) are in the structure of distiphallus. Ejaculatory apodeme not found.

Female unknown but probably not morphologically separable from that of *S. clunipes*.

Discussion: The species is extremely similar to *S. clunipes* (MEIGEN) and differs from it in its simple male t_1 and fore tarsus and more curved male t_3. Owing to this primitive plesiomorphic feature it is considered to represent a species identical or closely allied to the ancestor from which *S. clunipes* was derived. Because *S. faeroensis* (DEEMING) is very rare it is possible that it is becoming extinct as it cannot compete with the ecologically non-specialized and very successful *S. clunipes*. On the other hand, the possibility that *S. faeroensis* is only an atavistic male of *S. clunipes* with simple t_1 occurring rarely among normal specimens is not wholly eliminated although not confirmed.

Biology: Unknown. I have collected 3♂ on sheep excrement together with numbers of *S. clunipes*. Known occurrence data are from VIII and X (material examined).

Distribution: Hitherto only Faeroe Islands (DEEMING, 1966; LYNEBORG, 1968) and Czechoslovakia (Slovakia – material examined, new).

Spelobia (Spelobia) baezi (PAPP, 1977), **comb. nov.**

(Figs. 461–471)

Limosina baezi PAPP, 1977a: 124

Type material: Holotype ♂: Canary Is., Tenerife, El Socorro, 1. 12. 1973, M. BAEZ leg. (ULT, examined). Paratype ♂: Tenerife, Agua manga, 11. 4. 1976, M. BAEZ leg. (TMB, not examined).

Material examined (besides "Type material"): 9 ♂ 8 ♀

Canary Islands: 2 ♂ (ULT) – Gran Canaria-Las Lagunetas, Hierro-El Pinar (BAZE leg.).

Spain: 7 ♂ 8 ♀ (JRO) – Sierra Nevada Mts.-Llano Prado, Güejar Sierra nr. Granada, Grazalema nr. Ronda (ROHÁČEK leg.).

Description:

Male. Total body length 1.43–1.87 mm. General colour blackish brown, scarcely brown dusted, subshining. Head dark brown, occiput, ocellar triangle, orbits and interfrontalia grey dusted; anterior margin of frons yellow to yellowish brown. 3 longer *if* and 1 small in front of them; true *pvt* distinct, anterior false *pvt* small. 5–6 small *ads* between and inside *ors*. Frontal lunule, face and gena brown; facial cavity dark brown, rather shiny. Eye of normal size, its diameter about 3 times the narrowest genal width; *g* of medium length. Antennae dark brown, 3rd segment paler. Arista about 3.5 times as long as antenna, distinctly longer ciliate than 3rd antennal segment.

Thorax blackish brown, mesonotum despite some pollination shiny. 2 *dc*, the anterior short. 8 rows of *ac* microsetae in front of suture. The medial prescutellar *ac* pair enlarged though not as much as in typical specimens of *S. clunipes*. Pleurae more pruinose and duller; 2 *stpl*, the anterior small. Scutellum roughly triangular, with long *sc*. Legs brown, trochanters, knees and tarsi paler. t_1 somewhat thickened and incised anteriorly but distinctly more slender than in *S. clunipes*, fore tarsi less dilated than in *S. clunipes*. t_2 chaetotaxy (Figs. 470, 471) similar to that in *S. clunipes*. Ratio t_2: mt_2 = 1.93–2.07. Wing (Fig. 464) light greyish, veins pale brown. *C* hardly overpassing R_{4+5}. R_{4+5} straight. Discal cell moderately long, both its outer corners with short appendages of M_{1+2} and M_{3+4} beyond t_p; that of M_{1+2} continued by colourless fold. Alula broad,

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rounded. Wing measurements: length 1.39–1.76 mm, width 0.65–0.75 mm, *C*-index = 1.10–1.40, $t_a - t_p : t_p = 2.17$ to 3.00. Halteres ochreous yellow, knob brownish yellow.

Abdomen blackish brown, sparsely shortly haired. *T1+2* with basal pale pigmented area as in *S. palmata*. *S5* (Fig. 461) with characteristic posteromedial double comb of spines, the more posterior row of spines with filiform elongate tips. In contrast to all related species bristles in front of posteromedial comb simple, not thickened or hook-like curved.

Genitalia. Periandrium as in *S. clunipes*. Telomere (Fig. 462, in a rather different view than that in Fig. 2 of PAPP, 1977a) less pubescent externally than in *S. clunipes* and the ventral spine much longer. Aedeagal complex (Fig. 463) also similar to that of *S. clunipes* but postgonite somewhat more slender apically and dorsal projection of distiphallus different. Ejaculatory apodeme present, small.

Female (femina nova). Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.51–1.95 mm. Ratio $t_2 : mt_2 = 1.93–2.09$. t_1 simple, slender, fore tarsus indistinctly dilated. Wing measurements: length 1.31–1.83 mm, width 0.62–0.81 mm, *C*-index = 1.13–1.28, $t_a - t_p : t_p = 2.07–2.91$. Preabdomen as in the male.

Postabdomen (Figs. 465–467) very similar to that of *S. palmata*. *T6* simple. *T7* not divided but dorsally pale pigmented and weakly sclerotized, only its lateral parts dark. *T8* dorsally shortened and medially paler pigmented but not divided; laterally extended as usual. *T9* rather large, with 2 relatively long dorsal bristles situated quite laterally (in contrast to those in *S. clunipes* and *S. palmata*). *S6* and *S7* simple, somewhat narrower than those of *S. palmata*. *S8* comparatively short, with 2 long, hair-like setae and membraneous posterior margin. *S9* large, broader than *S8*, with some minute setulae. Spectacles-shaped sclerite (Fig. 469) distinct but its medial part weakly sclerotized; it generally resembles that of *S. palmata*, especially with regard to its rings. Spermathecae (Fig. 468) also as in *S. palmata* or *S. clunipes*. Cerci unusually slender, more slender than in *S. palmata*, each with a long sinuate apical hair, thick and short dorsopreapical seta and reduced ventropreapical hair besides lateral setulae, thus similar in armature to that of *S. palmata*.

Discussion: The species is somewhat intermediate between *S. clunipes* and *S. palmata*. It resembles the former in its enlarged prescutellar *ac*, shorter mt_2 and male genitalia; its female postabdomen and *T1+2* is more similar to those of *S. palmata*. *S. baezi* can be safely distinguished by its telomere, male *S5* and more slender male t_1 and fore tarsus and by some details of the female postabdomen (very widely separated setae on *T9*, slender cerci). Although the female postabdomen is very similar to that of *S. palmata*, *S. baezi* is easily distinguished by its greyish (not brown) wings.

The holotype of *S. baezi* (PAPP) has been examined. The validity of this species has been proved by study of some additional material including the first known females.

Biology: Hitherto a very little known species. I have collected it by sweeping on stream shores and meadows (5♂ 5 ♀), on decayed grass (1 ♂ 1 ♀) and in runs of *Arvicola* spec. (1 ♂ 2 ♀), in Sierra Nevada up to 2,200 m. Adults were found in III–V, XII (PAPP, 1977a and material examined).

Distribution: Canary Islands (PAPP, 1977a), South Spain (material examined, new).

Spelobia (Spelobia) palmata (RICHARDS, 1927), **comb. nov.**

(Figs. 7, 26, 27, 472–483)

Limosina palmata RICHARDS, 1927: 36; PAPP, 1973c: 59 (key)
Leptocera (*Limosina*) *palmata*: RICHARDS, 1930: 301
Limosina (*Limosina*) *palmata*: DUDA, 1938: 136
Leptocera palmata: NARTSHUK, 1970: 350 (key)
Limosina (*Limosina*) *Leruthi* DUDA, 1938: 128

Type material:
Limosina palmata RICHARDS: Lectotype ♂ (des. by ROHÁČEK in 1980) labelled: "*palmata* ♂ Bagley Wd. 21/2/26 in mouse trap", "Mouse trap 21. Feb. 1926 Nr. Oxford, Bagley Wd. dd. 1927 O. W. RICHARDS", "1927 10", "14192", "1927 E. M. M. 63:36" (UMO). Paralectotype ♀ labelled: "*palmata* ♀ dead rabbit Bagley Wd. 28/2/26", "Dead Rabbit 28 Feb. 1926. Nr. Oxford, Bagley Wd. dd. 1927 O. W. RICHARDS", "1927 11", "14256", "1927 E. M. M. 63:36" (UMO). Further specimens belonging to type series are deposited in BML and UMO (not examined).
Limosina (*Limosina*) *Leruthi* DUDA: Holotype ♀ labelled: "B 45, 22. II. 1935, R. LERUTH leg.", "*Limosina Leruthi* D. ♀, d DUDA" and "Type" (IRB, examined).

Material examined (besides "Type material"): 122 ♂ 146 ♀

Spain: 1 ♂ (JRO) — Cullar de Baza env. (ROHÁČEK leg.).

Belgium: 1 ♂ (IRB) — Hautes-Fagnes: Hockai (COLLART leg.).

Czechoslovakia: 111 ♂ 127 ♀ (JRO, JZP, NMP, PFB, SMO, MHK) — Bohemia: Soós (ZUSKA leg.), Doupovské hory Mts.-Lochotín, Nečemice nr. Rakovník (ROHÁČEK leg.), Bečov nr. Most (JEŽEK leg.), Dobřichovice (ZUSKA leg.), Protivín (VIMMER leg.), Lešany nr. Benešov, Praha-Strašnice (KOVÁŘ leg.), Praha-Krč (ZEMAN leg.), Palupín nr. Strmilov, Slavonice (ROHÁČEK leg.), Seč, V. Deštné Mt., Uhersko, Prachovské skály, Choltice, Pardubice-Svítkov (MOCEK leg.);

Moravia: Třešť, Brno-Ledná, Mor. Kras-Babice, Býčí skála (ROHÁČEK leg.), Lednice (OBRTEL leg.), Pohořelice (MOCEK leg.), Vranovice (ROZKOŠNÝ leg.), Milovice nr. Mikulov (POKORNÝ leg.), Pálava, Kouty n. D., H. Jeseník Mts.-Skřítek, Brumovice, Hněvošice (distr. Opava), Hukvaldy (ROHÁČEK leg.) and localities given by ROHÁČEK (1980); Slovakia: Slov. Kras-Kečovo, Belanské Tatry Mts.-Monkova dolina, Vihorlat Mts.-Sninský kameň Mt., Remetské Hámre (ROHÁČEK leg.), Branisko (BENEŠ leg.).

Bulgaria: 1 ♀ (IZS) — s. Jastrebina-Targovpschen (BESHOVSKI leg.).

Denmark: 9 ♂ 17 ♀ (ZMK) — SZ: Sorø Sø (LUNDBECK leg.); NEZ: Holte, Ermelund (LUNDBECK leg.), Geel Skov (MORTENSEN leg.), Rungsted (TUXEN leg.), Rødovre (BUCH leg.), Bagsvaerd (LYNEBORG leg.).

USSR: 1 ♀ (IZS) — Leningrad-Gattschino (BESHOVSKI leg.).

Description:
Male. Total body length 1.70–2.18 mm, general colour blackish brown, brown dusted, subshining. Head brownish black. Frons blackish brown to black, only a narrow anterior margin pale brown. Frontal triangle shining black. Ocellar

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triangle, orbits and interfrontalia silvery grey dusted and glittering; the rest of frons between frontal triangle, interfrontalia and orbits blackish dusted and dull. 2 pairs of *pvt*; the anterior false pair small, the true posterior *pvt* relatively large. 3–4 *if*, the most anterior short (strongly reduced if 4 *if* present), others comparatively strong. 6–8 small *ads* inside and below *ors*. Frontal lunule, face and anterior part of gena brown, greyish brown dusted. Posterior part of gena blackish brown, as is also the rather shining facial cavity. *g* medium long, usually 2 small setulae behind it. Eye of medium size, its diameter about 2.9 times the narrowest genal width. Antennae black, 1st and 3rd segment brown to blackish brown; arista about 3.5 times as long as antenna, rather long ciliate.

Thorax brownish black; mesonotum shiny despite some greyish brown pruinosity, pleurae somewhat duller. 2 *hu*, the internal reduced and hardly longer than the additional anteroexternal microseta on humeral callus. 2 *dc*, both postsutural; the anterior *dc* comparatively short. 8–10 rows of *ac* microsetae between anterior *dc*; the medial prescutellar *ac* pair only slightly enlarged and always shorter than anterior *dc*. Scutellum elongate triangular, *sc* long. Pleurae with yellowish brown sutures between sclerites; 2 *stpl*, the anterior reduced to a microseta. Legs dark to blackish brown, fore coxa, trochanters, knees and tarsi paler brown. t_1 clavate, anteriorly incised; fore tarsi dilated and flattened as in *S. clunipes*. t_2 chaetotaxy (Figs. 472, 473) similar to that of *S. clunipes* but with a short proximal *pd* in addition. Ratio t_2: $mt_2 = 1.88–1.95$. mt_2 with *av* and *pv* rows of short spines. Wing (Fig. 474) with distinctly brownish membrane, veins brown. *C* not extended beyond R_{4+5}. R_{4+5} straight, sometimes apically very slightly curved up to *C*. Discal cell of medium length, both appendages of M_{1+2} and M_{3+4} beyond t_p usually short. The colourless fold continuing M_{1+2} behind t_p parallel to R_{4+5}. Alula large, wide, rounded. Wing measurements: length 1.47–1.99 mm, width 0.65–0.91 mm, *C*-index = 1.10–1.48, t_a–t_p: t_p = 1.85–3.00. Halteres yellow with darker, brown or greyish knob.

Abdomen blackish brown, sparsely greyish brown dusted, rather shiny. Terga sparsely haired, only posterolateral corners with longer bristles. Sterna more densely haired. *T1+2* with a weakly sclerotized and pale pigmented area (Fig. 481). *S5* (Fig. 475) with posteromedial comb of spines composed of 2 rows of larger spines and 1 (most anterior) row of small spines. There is a group of thick bristles in front of the posteromedial comb. Pigmentation as figured.

Genitalia. Periandrium comparatively small, with the usual long dorsolateral hair-like bristle and shorter laterocaudal one, otherwise short haired. Cerci as in *S. clunipes*, each with a long hair-like bristle and some short setulae. Telomere (Fig. 476) rather characteristic, with well differentiated anterior lobe carrying some distinctive setulae arising on small tubercles. Posterior part with comparatively short setiform hairs and long, robust ventral spine. Micropubescence sparse and long, rather irregularly covering outer side of telomere. Aedeagal complex (Fig. 477) very similar to that of related species, with simple, compact phallophore; distiphallus of usual construction but with dorsopreapical projection with 2 pale, finely serrate keels (somewhat resembling those of *S. villosa*). Postgonite S-shaped, comparatively pointed and bearing some minute setulae on outer side. Ejaculatory apodeme present, small.

Female. Similar to male but differs as follows. Total body length 1.69–2.62 mm. t_1 simple, slender, also fore tarsus more slender, less dilated. t_2 chaetotaxy as in male but bristles usually stronger. Ratio t_2: $mt_2 = 1.89–2.00$. Wing measurements: length 1.43–2.36 mm, width 0.62–1.03 mm, *C*-index = 1.15–1.49, t_a–t_p: t_p = 2.00–3.09.

Postabdomen (Figs. 478–480). *T6* simple. *T7* medially weakly sclerotized and very pale pigmented (often appearing to be divided into 2 sclerites). *T8* very shortened medially and enlarged laterally. *T9* shortly triangular, with a pair of rather long dorsal setulae situated more medially than those of *S. baezi*. *S6* and *S7* simply transversely oblong, shortly setulose. *S8* resembling that of *S. clunipes*, with pale pigmented posterior margin and 2 long ventral bristles. *S9* comparatively short, finely pubescent, with 2 longer and some minute setulae on posterior margin. Spectacles-shaped sclerite (Fig. 483) weakly sclerotized and pale pigmented, rather similar to that of *S. baezi*. Spermathecae (Fig. 482) tyre-shaped, with conically dilated sclerotized part of ducts and protrusible internal sac. Cerci more slender than in *S. clunipes* but more robust than in *S. baezi*, each with a long sinuate apical hair, short and thickened and curved dorsopreapical seta and short ventral and lateral hairs, thus in armature resembling most that of *S. baezi*.

Preimaginal stages: GODDARD (1938: 245, Fig. 6) described and illustrated the puparium. It is very similar to that of related species and cannot be safely distinguished from them (see OKELY, 1974). Cephalopharyngeal skeleton of 3rd instar larva is figured in Fig. 7, some details of puparium in Figs. 26, 27.

Discussion: *S. palmata* (RICHARDS) is closely related to *S. clunipes* (MEIGEN) and *S baezi* (PAPP). The latter species seems to be its nearest relative judging from the similarity of the formation of female postabdomen, long ventral spine on telomere and weakly sclerotized area on *T1+2*. *S. palmata* differs from *S. baezi* in its strongly incrassate male t_1 and dilated fore tarsus, short medial prescutellar *ac*, brownish wings, different telomere, distiphallus, thicker postgonite, thicker and shorter female cerci and female *T9* with more medially situated dorsal setae. *S. clunipes* can be easily distinguished from *S. palmata* by its simply sclerotized *T1+2* apart from the armature of telomere, male *S5* and female cerci.

The holotype of *Limosina leruthi* DUDA, 1938, has been examined and it is *S. palmata* (RICHARDS). Therefore it was synonymized by ROHÁČEK (1981). The main feature by which DUDA (1938) diagnosed *L. leruthi*, the slightly upcurving R_{4+5}, is a rather commonly occurring intraspecific variant of *S. palmata* without taxonomic significance.

Biology: A common, predominantly necrophagous species (breeding records from dead snails — RICHARDS, 1930; DEEMING & KNUTSON, 1966) mostly collected on a variety of carrion (HACKMAN, 1963b; PAPP, 1973c) — I have more records from dead slugs, mice, squirrel, roe deer, decaying cattle bones. It was frequently found in runs and nests of small mammals (RICHARDS, 1927, 1930; GODDARD, 1938; DEEMING & KNUTSON, 1966; HACKMAN, 1963b, 1967a) where it probably develops in dead animals or the food refuse of carnivores, and caught by means of soil traps (ROHÁČEK, 1975a, 1980; PAPP, 1976a; PAPP & PLACHTER, 1976). I have also repeatedly captured it on decayed fungi (also COE, 1962b). Conversely, it is rare in caves (DUDA, 1938 — *Limosina leruthi*, and my findings), rotten vegetation (I have bred several specimens from decayed grass) and on excrement (PAPP, 1973b, 1976b). It has at least 3 generations during the vegetation period (ROHÁČEK, 1975a),

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imagoes occur during the whole year (combined data of various authors and material examined).

Distribution: Hitherto known from only the W. Palaearctic. Besides Europe, there is a single record from Tunisia (PAPP, 1977b). European records: Spain (material examined, new), Balearic Is. (PAPP, 1973), GB: England, Wales, Scotland (RICHARDS, 1927, 1930, 1976; GODDARD, 1938), Belgium (DUDA, 1938), Czechoslovakia (ROHÁČEK, 1975a, 1978b, 1980), Hungary (PAPP, 1973c, 1976a), Jugoslavia (COE, 1962b), Bulgaria (material examined, new), Faeroe Is. (LYNEBORG, 1968), Denmark (material examined, new), Sweden (HACKMAN, 1967a), Finland (HACKMAN, 1963b; PAPP, 1973b), USSR: distr. Leningrad (material examined, new).

Spelobia (Spelobia) talparum (RICHARDS, 1927), **comb. nov.**

(Figs. 484–487, 491–498)

Limosina talparum RICHARDS, 1927: 37; PAPP, 1973c: 59 (key)
Leptocera (*Limosina*) *talparum*: RICHARDS, 1930: 302
Leptocera talparum: SÉGUY, 1934: 470; NARTSHUK, 1970: 350 (key)
Limosina (*Limosina*) *talparum*: DUDA, 1938: 150

Type material: Lectotype ♂ (des. by ROHÁČEK in 1980) labelled: "Hogley 2. 1. 09 moles", "*talparum* ♂", "Mole nest 2 Jan. 1909. Nr. Oxford, Hogley Bog. A. H. HAMM dd. 1927", "1927 14" (UMO); paralectotype ♀ labelled: "Woolhampton 9. 4. 09 moles", "*talparum* ♀", "Mole nest. 9 Apr. 1909, Newbury, Woolhampton A. H. HAMM", "1927 18", (UMO). Further specimens belonging to type series are deposited in BML and UMO (not examined).

Material examined (besides "Type material"): 112 ♂ 215 ♀
Spain: 2 ♂ 1 ♀ (JRO) — Sierra Nevada-Llano Prado, Grazalema nr. Ronda (ROHÁČEK leg.).
Belgium: 5 ♂ 4 ♀ (IRB) — Maransart, Chapelle St. Lambert, Basse Wavre (LELEUP leg.).

Czechoslovakia: 82 ♂ 178 ♀ (JRO, JZP, NMP, PFB, SMO, MMB, RMM, MHK) — Bohemia: Soós (ZUSKA leg.), Doupovské hory Mts.-Doupov (ROHÁČEK leg.), Černý rybník nr. Klíny (SCHÖN leg.), Krkonoše Mts.-Kotelné jámy (ZUSKA leg.), Praha-Strašnice (KOVÁŘ leg.), Černá nr. Bohdaneč, Pardubice-Svítkov (MOCEK leg.), Dačice (ROHÁČEK leg.); Moravia: Třešť, Pálava (ROHÁČEK leg.), Mušov (POKORNÝ leg.), Rozkoš (MOCEK leg.), Kojetín, Hlubočky (LAUTERER leg.), Hradec n. M., H. Jeseník Mts.-Skřítek, Rejvíz, Vsetín.vrchy Mts.-Cáb, Úvalenské louky (distr. Opava) (ROHÁČEK leg.) and localities given by ROHÁČEK (1980); Slovakia: Patince nr. Komárno, Lubochňa, Belanské Tatry Mts.-Biele pleso, Monkova dolina, Šarpanec, Dolina siedmi prameňov, V. Tatry Mts.-Batizovská dolina, Vihorlat Mts.-Rem. Hámre (ROHÁČEK leg.), Branisko (BENEŠ leg.).

Austria: 22 ♂ 25 ♀ (IZI) — Tyrol: Obergurgl Mt., Hohe Tauern-Badgastein (TROGER, STOCKNER leg.).

Bulgaria: 1 ♂ 4 ♀ (IZS) — E. Rhodope Mts.-Harmanli, Rutscheiniza-Blavgoevgrad, Razlog Predela, Katschula-Strandja (BESHOVSKI leg.).

Denmark: 3 ♀ (ZMK) — F: Mullerup (BUCH leg.), Hunoble-Langeland (MARTIN leg.); NEZ: Naerum (LUNDBECK leg.).

Description:

Male. Total body length 1.55–2.10 mm, general colour blackish brown, greyish brown dusted but comparatively shiny. Head (Fig. 496) blackish brown. Frons usually with pale brown anterior margin, otherwise blackish brown to black. Frontal triangle narrow and shiny; orbits and interfrontalia silvery grey dusted and glittering; ocellar triangle and occiput greyish brown dusted, subshining; stripes between frontal triangle, interfrontalia and orbits blackish brown dusted, dull. 2 pairs of *pvt*, the anterior false pair small. 4 *if*, the most anterior much shorter than others. 6–8 minute *ads* inside and below *ors*. Frontal lunule and face usually pale or reddish brown. Gena and facial cavity dark brown to blackish brown, the latter shining. Eye not reduced, its diameter about 2.7 times the narrowest genal width. Antennae black or third segment dark brown. Arista about 4.0 times as long as antenna, shortly ciliate.

Thorax brownish black, greyish brown dusted. Mesonotum shining despite pruinosity, pleurae much duller. 2 usual *hu* (the internal minute) and 1 additional microseta on humeral callus. 2 *dc*, the anterior not very long. 8 rows of *ac* hairs between anterior *dc*. Prescutellar *ac* pair only slightly enlarged. Scutellum elongately triangular, *sc* long. Sutures between pleural sclerites yellowish brown. 2 *stpl*, the anterior minute. Legs slender, dark to blackish brown, trochanters, knees and terminal segments of mid and hind tarsi paler. t_1 clavately dilated and anteriorly impressed (incised) as in *S. clunipes*. Fore tarsi long but strikingly dilated and flattened. t_2 chaetotaxy as in Figs. 497, 498, mid tarsus long and slender, especially mt_2. Ratio t_2: mt_2 = 1.54–1.71. Wing (Fig. 484) with pale greyish brown membrane, veins brown. *C* not extended beyond R_{4+5}. R_{4+5} straight. Discal cell of medium length, with short pigmented appendages of M_{1+2} and M_{3+4} beyond t_p; that of M_{1+2} continued by colourless fold, that of M_{3+4} usually longer. Alula large, broad and rounded but smaller than in *S. clunipes*. Wing measurements: length 1.27–2.04 mm, width 0.57–0.85 mm, *C*-index = 0.94–1.14, t_a–t_p: t_p = 1.80–2.75. Halteres dirty yellowish brown, stem paler.

Abdomen blackish brown, brown dusted, subshining. Terga sparsely and relatively shortly haired. Sterna more densely setulose. *T1+2* with weakly sclerotized and paler pigmented area as in *S. czizeki*. *S5* (Fig. 485) with posteriomedial comb composed of 2 rows of spines and centrally with a group of short, thick but simple (not hook-like curved) spine-like bristles of lesser extent than in *S. talis* spec. nov.

Genitalia. Periandrium with a long dorsolateral hair-like bristle; laterocaudal seta not very long, shorter than caudal hair on cercus and generally shorter haired than that of *S. talis* spec. nov. Cerci as in *S. czizeki*, each with some short setulae besides the long caudal hair. Hypandrium of medium length. Telomere (Fig. 486) with robust and long ventral spine and long setiform hairs (these less numerous and shorter than in *S. talis* spec. nov.). Micropubescence of telomere sparse and concentrated mainly posteriorly. Aedeagal complex (Fig. 487) with usual robust phallophore and distiphallus with characteristic dorsopreapical projection with pale dorsal process. Postgonite S-shaped, slender, apically pointed and with some minute setulae on outer side. Ejaculatory apodeme not found.

Female. Similar to male but differs as follows. Total body length 1.61–2.24 mm. t_1 slender and not dilated, fore tarsus simple, slender and long. t_2 chaetotaxy as in male. mt_2 regularly with some (2–3) short *av* setulae (Fig. 498). Ratio t_2: mt_2 = 1.58–1.70. Wing measurements: length 1.41–2.08 mm, width 0.56–0.89 mm, *C*-index = 0.90–1.16, t_a–t_p: t_p = 2.00 to 2.56. Abdomen with enlarged membraneous pleural parts and hence greatly distended in very gravid specimens.

Postabdomen (Figs. 491, 492). *T6* and *T7* simple, latter shorter and somewhat extended laterally, haired only at posterior margin. *T8* dorsomedially shortened, pale pigmented and membraneous, appearing to be divided into 2 plates. Lateral parts of *T8* strongly extended. *T9* roughly triangular, with 2 comparatively long dorsal setae situated more medially than those of *S. talis* spec. nov. *S6* and *S7* simple, shortly evenly haired. *S8* similar to that of *S. czizeki* but smaller, with

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the membraneous posterior margin and 2 long ventral hairs. *S9* short as in related species. Spectacles-shaped sclerite (Figs. 493, 494) with weakly sclerotized medial part and long, narrow rings. Spermathecae (Fig. 495) tyre-shaped, each with conically dilated sclerotized terminal parts of ducts and protrusible internal sac. Cerci comparatively long, each with a longer apical and dorsopreapical sinuate hair and short, slightly curved ventropreapical and lateral hairs.

Preimaginal stages: GODDARD (1938: 247, Fig. 8) described and illustrated the puparium. It is very similar to those of related species (*S. clunipes*, *S. manicata*, *S. palmata*, *S. pseudonivalis*) and according to OKELY (1974) it is impossible to distinguish it from them with certainty.

Discussion: *S. talparum* (RICHARDS) forms, with *S. talis* spec. nov., *S. czizeki* (DUDA), *S. pseudonivalis* (DAHL) and probably some species described by PAPP (1973a) from Mongolia, a separate species-group characterized by prolonged legs, cavernicolous habits, distiphallus with similar construction and comparatively short female *S9*.

Male *S. talparum* is distinguishable from all European relatives by its strongly clavate and anteriorly incised t_1 and dilated fore tarsus. However, the female of *S. talparum* is difficult to distinguish from that of *S. czizeki* (see key).

Biology: Typical microcavernicolous species with polysaprophagous larvae (bred from various kinds of bait exposed in burrows of small mammals by HACKMAN, 1963b) commonly occurring in burrows and nests of various small mammals (RICHARDS, 1927, 1930; GODDARD, 1938; VANSCHUYTBROECK, 1942; HACKMAN, 1963a, b, 1965b, 1967a; PAPP, 1973c), eucoenic for this habitat. Free-living females are also relatively frequently collected and were obtained in large numbers by the soil trap method (PAPP, 1976a; ROHÁČEK, 1980). This is probably due to increased migrational activity of gravid females searching for new burrows for oviposition. *S. talparum* has been found much more rarely in caves (PAPP & PLACHTER, 1976). According to GODDARD (1938) the pupal stage lasts 5–18 days. Imagoes occur during the whole year (RICHARDS, 1930) because of their continuous development in subterranean habitats.

Distribution: Widespread in Europe. The extra-European records from Afghanistan (RICHARDS, 1961; HACKMAN, 1969c) probably refer to different species — at least the latter record refers to *S. ghaznavi* (PAPP, 1978). Hitherto known from Spain (HACKMAN, 1967a, 1969b), France (FALCOZ, 1921 — as *L. czizeki*; RICHARDS, 1927), GB: England (RICHARDS, 1927, 1930, 1976; GODDARD, 1938), Belgium (VANSCHUYTBROECK, 1942), Czechoslovakia (DOSKOČIL, 1973; ROHÁČEK, 1978b, 1980), Austria (TROGER & ROHÁČEK, 1980), Hungary (PAPP, 1973c, 1976a), Bulgaria, Denmark (material examined, new), South Sweden (HACKMAN, 1967a), South Finland (HACKMAN, 1963a, b). Probably absent in Finnish Lapland (HACKMAN, 1963a).

Spelobia (Spelobia) talis spec. nov.

(Figs. 488–490, 499–502)

Type material: Holotype ♂: Switzerland, Canton de Vaud, Cudrefin, 435 m, 6. 9. 1972, P. H. ARNAUD, Jr. leg. Allotype ♀: same data as for holotype; paratype ♂: same data as for holotype but collected 5. 9. 1972 (all CAF). All specimens with detached and dissected abdomina, preserved in plastic tubes with glycerine, pinned below respective specimens and labelled by L. PAPP as "*Limosina* sp. n. in *clunipes* group".

Description:

Male. Total body length 1.83 mm (male paratype not measurable owing to detached abdomen). General colour blackish brown. Head colouring as in *S. talparum*. *pvt* small, in 2 pairs but the false anterior pair very minute. 4 *if*, the most anterior smaller. 4–5 *ads* inside and below *ors*, and some hairs on face in addition. *g* small, a little longer than 2 setae behind it. Eye small, reduced (Fig. 501), its diameter about 1.5–1.6 times the narrowest genal width. Antennae strongly divergent, blackish, only basal segment brown. Arista about 3.2 times as long as antenna, shortly and densely ciliate.

Thorax blackish brown, pleurae paler. Mesonotum despite greyish brown pollination shining. 2 *hu*, the internal small, shorter than the additional anteroexternal microseta on humeral callus. 2 *dc*, the anterior relatively strong. 8 rows of *ac* hairs between anterior *dc*, the prescutellar medial pair only a little enlarged. Scutellum elongately triangular, *sc* long. Pleurae with yellowish brown sutures. 2 *stpl*, the anterior minute. Legs dark brown, trochanters, knees and tarsi brown to yellowish brown. Tarsi long and slender, t_1 hardly thickened and with shallow, barely visible anterior impression; fore tarsus slender and long. t_2 chaetotaxy (Figs. 499, 500), mt_2 long and slender, with characteristic row of 4–6 *av* spines. Ratio $t_2 : mt_2 = 1.64–1.70$. Wing (Fig. 502) pale brownish grey, veins brown. *C* not extended beyond R_{4+5}. R_{4+5} straight. Discal cell of medium length, with short appendages of M_{1+2} and M_{3+4} beyond t_p, that of M_{1+2} continued by colourless fold, parallel to R_{4+5}. Alula large, broad, rounded. Wing measurements: length 1.78–1.91 mm, width 0.69–0.77 mm, *C*-index = 0.92–1.04, $t_a–t_p : t_p = 2.21–2.36$. Halteres orange, knob orange brown.

Abdomen blackish brown, greyish brown pollinose. Terga very sparsely and shortly haired. Sterna more densely, shortly haired. *T1+2* with paler pigmented and weakly sclerotized basal medial area. *S5* (Fig. 488) with posteromedial double comb of spines and a group of dense, short, thick, spine-like bristles in the middle. This group composed of more robust spines and covering larger area than in *S. talparum*. Pigmentation similar to that of *S. talparum*.

Genitalia. Periandrium as in *S. czizeki*, with the usual long dorsolateral and shorter laterocaudal (longer than in *S. talparum*) hair-like bristle. Cercus with a long hair besides some short setulae. Hypandrium of medium length. Telomere (Fig. 489) similar to that of *S. talparum* but with differently arranged short setulae on anterior part and distinctly longer setiform hairs on posterior part. Aedeagal complex (Fig. 490) also similar to that of *S. talparum* but phallophore slightly different and dorsal projection of distiphallus shorter and with more robust dorsal pale process. Ejaculatory apodeme present but small.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 2.10 mm. t_2 and mt_2 chaetotaxy as in male. t_1 more slender (normal). Ratio $t_2 : mt_2 = 1.72$. Wing measurements: length 1.87 mm, width 0.81 mm, *C*-index = 1.06, $t_a–t_p : t_p = 2.14$. Preabdomen as in male.

Postabdomen as in *S. talparum* or *S. czizeki*. *T6* simple. *T7* somewhat extended laterally and with hairs only posteriorly. *T8* dorsomedially membraneous, lateral lobes strongly enlarged. *T9* as in *S. czizeki*, with paler pigmented small basal medial area, and with the 2 usual dorsal setae situated more laterally than those of *S. talparum* or *S. czizeki*. *S6* and *S7* simply transversely oblong and shortly densely haired. *S8* posteriorly membraneous and with 2 usual long setae, *S9*

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comparatively short, similar to that of *S. talparum* (cf. Fig. 492). Spectacles-shaped sclerite weakly sclerotized and resembling that of *S. talparum*. Spermathecae tyre-shaped, with large, conically dilated terminal parts of ducts, as in *S. talparum*. Cerci also quite similar to those of *S. talparum*.

Discussion: The species is most closely related to *S. talparum* (RICHARDS) having very similar male genitalia and female postabdomen but differs in its reduced eyes, slender male t_1 with indistinct shallow anterior incision, chaetotaxy of mt_2 (Fig. 500) and some details in male *S5*, telomere, distiphallus and female *T9*.

Biology: Unknown. Type specimens were collected in IX.

Distribution: Switzerland (material examined).

Spelobia (Spelobia) czizeki (DUDA, 1918), comb. nov.

(Figs. 503–517)

Limosina (Scotophilella) Czizeki DUDA, 1918: 176
Leptocera (Scotophilella) Czizeki: DUDA, 1925: 163 (key)
Limosina (Limosina) Czizeki: DUDA, 1938: 118
Limosina Czizeki: PAPP, 1973c: 59 (key)

Type material: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "200. 16. VIII. 1915 Wypustek" and "*Czizeki* ♂ d. DUDA" (inv. no. 1609/Ent.; MMB). Paralectotypes: 1 ♂ 1 ♀ with same data as for lectotype (inv. nos. 1610, 1611); 3 ♂ 1 ♀ labelled: "No. 200 Wypustek" (inv. nos. 1612–1615); 1 ♀ labelled: "Ochoser Höhle, 13. IX. 1911" (inv. no. 1608); 1 ♂ 2 ♀ labelled: "193. 24. VII. 1915 Bučiskala" (inv. nos. 1616–1618); 1 ♂ 3 ♀ labelled: "210. 11. IX. 1915 Bučiskala" (inv. nos. 1619–1622). All in MMB.

Material examined (besides "Type material"): 21 ♂ 12 ♀

Spain: 1 ♂ (JRO) – Güejar Sierra nr. Granada (ROHÁČEK leg.).

Czechoslovakia: 18 ♂ 12 ♀ (JRO, RMM) – Moravia: Třešť, Pálava (ROHÁČEK leg.), Mušov (POKORNÝ leg.); Slovakia: Patince nr. Komárno, Kečovo-Kečovská vyvieračka (cave) (ROHÁČEK leg.).

Bulgaria: 2 ♂ (IZS) – Zlatiza, G. Deltschev (BESHOVSKI leg.).

Description:

Male. Total body length 1.31–1.58 mm. General colour blackish brown, sparsely brownish grey dusted. Head brownish black, dull, frontal triangle more shining. Frons with brown orbits and narrow, grey dusted interfrontalia; anterior margin of frons pale brown to brownish yellow. Convergent *pvt* developed in 2 pairs, the posterior true *pvt* longer. 4 *if*, the most anterior and usually also the most posterior shorter. 3–5 small *ads* inside and below *ors*. Frontal lunule paler brown, facial cavity, face and gena brown. *g* of medium length. Eye diameter about 3.5 times the smallest genal width. Antennae brown. Arista approximately 3.9 times as long as the antenna and, contrary to *S. talparum*, longer ciliate.

Thorax blackish brown, mesonotum sparsely dusted and rather shiny, pleurae more dusted and duller. 2 *hu*, the internal small. 2 *dc*, the anterior short. 8 rows of *ac* hairs between anterior *dc*, the medial prescutellar *ac* pair somewhat longer than other *ac* microsetae but not strikingly enlarged. Scutellum roundly triangular. Sutures between pleural sclerites pale, yellowish brown. 2 *stpl*, the anterior short. Legs slender, brown; coxae, trochanters, knees and tarsi paler. t_1 slender, not incrassate but anteriorly with a shallow preapical impression usually rather indistinct. t_2 chaetotaxy as in Figs. 504, 505. mt_2 slender, though usually less prolonged than in *S. talparum*. Ratio t_2: $mt_2 = 1.63–1.87$. Wing (Fig. 506) with pale brownish membrane, veins brown. *C* not extending beyond R_{4+5}, ending nearer the apex of wing than unpigmented fold of M_{1+2}. R_{4+5} straight. Discal cell of medium length, with short appendages of M_{1+2} and M_{3+4} beyond t_p. Wing measurements: length 1.50–1.68 mm, width 0.63–0.71 mm, *C*-index = 0.85–1.09, $t_a - t_p : t_p = 2.30–2.78$. Alula large and broad, rounded. Halteres brownish yellow, knob darker.

Abdomen blackish brown, sparsely dusted, subshining. Terga sparsely but medium long haired; sterna more densely and shortly haired. *T1+2* with desclerotized and paler pigmented basal medial area, usually horseshoe-shaped (Fig. 503). *S5* pigmented as in Fig. 511, with a central group of short, thick, fishing-hook-like curved bristles and posteromedial comb composed of 2 rows of spines.

Genitalia. Periandrium (Figs. 509, 510) with a long dorsolateral hair-like bristle and a shorter laterocaudal one, otherwise very sparsely but rather long haired. Each cercus with usual long caudal hair. Hypandrium of medium length. Telomere (Fig. 508) with thick ventral spine shorter than in *S. talparum* and micropubescence covering dorsal, posterior and ventral part of outer side of telomere; its posterior part centrally and anterior part entirely bare. Aedeagal complex (Fig. 507) with robust and simple phallophore and distiphallus similar to that of *S. talparum*. Postgonite slender, long and apically pointed. Apical half of postgonite with some setulae externally. Ejaculatory apodeme not observed.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.31–1.89 mm. t_1 simple and slender. t_2 with somewhat longer bristles, especially ventrally. Ratio t_2: $mt_2 = 1.60–1.79$. Wing measurements: length 1.54–2.06 mm, width 0.63–0.83 mm, *C*-index = 0.79–1.20, $t_a - t_p : t_p = 2.00–2.64$.

Postabdomen (Figs. 512–514). *T8* medially weakly sclerotized and pale pigmented thus appearing to be separated into 2 sclerites; lateral lobes strongly enlarged. *T9* short, with mediobasal small and narrow, paler pigmented area, dorsally with a pair of setae. *S8* relatively large, tapering posteriorly, with a pair of long ventral setae and pale pigmented posterior margin. *S9* short, transverse, medially paler pigmented. Spectacles-shaped sclerite (Figs. 516, 517) very similar to that of *S. talparum* – as this structure is rather weakly sclerotized, it is not advisable to use its shaped as a criterion for distinguishing these species. Spermathecae (Fig. 515) tyre-shaped, each with conically thickened terminal part of duct and internal membraneous sac protrusible through terminal aperture. Cerci shorter than in *S. talparum*, each with longer dorsopreapical and apical sinuate hair, and short ventropreapical and lateral hair.

Discussion: The species belongs to the *S. talparum*-group and is closely related to *S. talparum* (RICHARDS) and *S. talis* spec. nov. Whereas it cannot be confused with *S. talis* spec. nov. because of its strikingly small eyes and with male *S. talparum* owing to its clavate t_1, it is hardly distinguishable from *S. talparum* in the female sex. There are only slight differences in ciliation of arista, chaetotaxy of mt_2 and size of *S8* (see key). However, the distinctness of *S. czizeki* (DUDA) is clearly confirmed by the armature of male *S5* (hook-like curved setae in the middle) and telomere (shorter ventral spine, different extent of micropubescence).

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Biology: A little known species, recorded almost exclusively from caves (DUDA, 1918, 1938; VANSCHUYTBROECK, 1943b; PAPP, 1973c; PAPP & PLACHTER, 1976). Contrary to PAPP's (1973c) opinion that it never lives in burrows of small mammals I have found 26 specimens in runs of *Microtus* spec. and *M. arvalis*. Only occassionally it occurs in the open (DUDA, 1918). I have seen 1 ♂ caught by soil traps, and PAPP (1979b) recorded 1 ♂ 1 ♀ bred from fungi. Adults examined were collected in IV—XI but the species probably develops continuously as do other micro- and/or macrocavernicolous species.

Distribution: Hitherto insufficiently known. I have some doubts about the correct identification of the only extra-European record (Afghanistan — RICHARDS, 1961). European records: Spain (material examined, new), Belgium (DUDA, 1938; VANSCHUYTBROECK, 1942), Czechoslovakia (DUDA, 1918, 1938; CZIŽEK, 1925; ROHÁČEK, 1978b), Austria (DUDA, 1918), Hungary (DUDA, 1918; PAPP, 1973c; PAPP & PLACHTER, 1976), Roumania (VANSCHUYTBROECK, 1943b), Bulgaria (material examined, new), USSR: Karelia (PAPP, 1979b).

Spelobia (Spelobia) pseudonivalis (DAHL, 1909), **comb. nov.**

(Figs. 518—535)

Limosina pseudonivalis DAHL, 1909: 369 (key); SCHMITZ, 1917: 232; PAPP, 1973c: 57 (key)
Limosina (Scotophilella) pseudonivalis: DUDA, 1918: 179
Leptocera (Scotophilella) pseudonivalis: DUDA, 1925: 161 (key)
Leptocera (Limosina) pseudonivalis: RICHARDS, 1930: 303
Leptocera pseudonivalis: SÉGUY, 1934: 468; NARTSHUK, 1970: 349 (key)
Limosina (Limosina) pseudonivalis: DUDA, 1938: 140

Type material: Holotype ♂ labelled: "Zool. Mus. Berlin, F.: Plagefenn, 3. 10. 09, S.: DAHL 1659, J. K., F. K. N." Very faded specimen (preserved in alcohol), its right wing, fore, mid and hind right leg and postabdomen mounted on a slide labelled: "*Limosina pseudonivalis* F. DAHL" and "DAHL 1659" (ZMB, examined).

Material examined (besides "Type material"): 7 ♂ 17 ♀

Czechoslovakia: 7 ♂ 17 ♀ (JRO, SMO, MHK) — Bohemia: Doupovské hory Mts.-Lochotín (ROHÁČEK leg.), Choltice (MOCEK leg.); Moravia: Třešť, Mor. Kras-Babice, H. Jeseník-Kouty n. D. (ROHÁČEK leg.), Lednice (OBERTEL leg.) and localities given by ROHÁČEK (1980).

Description:

Male. Total body length 1.98—2.78 mm, general colour brownish black, greyish brown dusted, subshining. Head dark brown to blackish (especially posteriorly). Frons broadly pale to yellowish brown anteriorly and dark to almost black posteriorly. Ocellar triangle rather shining, frontal triangle (very narrow), interfrontalia and orbits silvery grey dusted; the rest of frons brown to blackish grey dusted and dull. *pvt* in 2 pairs, the false anterior pair minute but the posterior true *pvt* well developed and crossing. 3—4 medium long *if*, mostly subequal in length or the most anterior shorter. Frontal lunule basally and the rather broad face pale brown to yellowish brown, latter with a row of 4—5 minute hairs in front of eye. Facial cavity dark brown, shining. Gena broad, *g* of medium length but a seta behind it often of almost the same length. Eye strongly reduced (Fig. 518), its diameter about 0.7 times the narrowest genal width. Antennae brownish black or black, 1st segment often brown; arista about 4.4 times as long as antenna and medium long ciliate.

Thorax comparatively narrow (owing to reduced wing musculature), brownish black and dark greyish brown dusted. Mesonotum subshining, pleurae duller. 2 *hu*, the external large but the internal minute, only slightly longer than an additional microseta on humeral callus. 2 *dc*, also the anterior comparatively long. 6—8 rows of *ac* hairs between anterior *dc*; the medial prescutellar *ac* pair considerably enlarged. Scutellum elongately triangular, *sc* long. Pleurae brown, with yellowish brown sutures between sclerites; 2 *stpl*, the posterior very long, the anterior small. Legs brown with yellowish fore coxa and trochanters, pale brown tarsi and blackish brown femora and tibiae. All legs very long and slender. t_2 chaetotaxy (Figs. 519, 520) characterized by more (2—3) long proximal *pd*. t_1 simple and slender. Ratio $t_2 : mt_2 = 1.98—2.10$. Wing (Figs. 521—523) polymorphic, from strongly brachypterous to submacropterous form. Wing membrane yellowish brown, veins brown. R_{4+5} straight and not overpassed by *C*. Discal cell short, hind outer corner often rounded, rarely even t_p may absent (Fig. 523). Alula comparatively narrow but rather large. Wing measurements of f. submacropt.: length 1.63—1.87 mm, width 0.69—0.75 mm, *C*-index = 1.06—1.23, $t_a—t_p : t_p = 1.92—2.55$; wing measurements of f. brach.: length 0.72 to 0.98 mm, width 0.31—0.39 mm, *C*-index = 1.14—1.54, $t_a—t_p : t_p = 1.50—2.14$. Halteres with yellowish stem and darker brownish knob but strongly reduced, especially in brachypterous form.

Abdomen blackish brown, greyish brown dusted, subshining. Terga and sterna moderately long and comparatively sparsely setulose. *T1+2* long (Fig. 532), with large, weakly sclerotized and pale pigmented medial basal area. *S5* (Fig. 528) comparatively simple, with posteromedial comb composed of 2 rows of spines (the posterior row of pointed spines, the anterior one of shorter blunt spines); disc of *S5* simply haired but with some thicker bristles in the middle.

Genitalia. Periandrium (Figs. 526, 527) small but comparatively long, sparsely haired, with a long dorsolateral hair-like bristle. Other bristles short or the laterocaudal one somewhat longer. Cerci as in related species, each with comparatively short, sinuate, hair-like bristle. Hypandrium of medium length. Telomere (Fig. 525) simple, oblong, with a short, robust ventral spine. Micropubescence on almost entire outer side with exception of upper, fore and lower margin. Posterior setiform hairs comparatively short. Aedeagal complex (Fig. 524) similar to that of *S. talparum*, including the dorsomedial preapical projection of distiphallus. Postgonite S-shaped, with some minute setulae on outer side. Ejaculatory apodeme not observed.

Female. Similar to male but differs as follows. Total body length 1.82—2.58 mm. t_2 with somewhat longer bristles, especially as regard the *va*. Ratio $t_2 : mt_2 = 1.81—2.00$. Wing measurements of f. submacropt.: length 1.42—1.71 mm, width 0.59—0.71 mm, *C*-index = 1.02—1.38, $t_a—t_p : t_p = 1.80—3.11$; wing measurements of f. brach.: length 0.67—1.19 mm, width 0.29—0.46 mm, *C*-index = 1.26—1.63, $t_a—t_p : t_p = 1.57—2.17$. Abdomen more densely haired dorsally and with large membraneous pleural part, extensible during gravidity. Gravid females have the swollen abdomina much broader than the thorax.

Postabdomen (Figs. 529—531) shortened. *T8* divided into 2 sclerites situated quite laterally. *T9* comparatively long, triangular, basally medially with a paler pigmented area, dorsally with 2 usual setae. *S6* and *S7* simple, the latter much shorter than the preceding. *S8* similar to that of related species, thus simple, with pale pigmented posterior margin and with 2 pairs of longer ventral setae (the medial pair longer). *S9* short, medially paler pigmented. Spectacles-shaped sclerite (Figs. 534, 535) simple and weakly sclerotized. Spermathecae (Fig. 533) tyre-shaped, with conically dilated sclerotized parts

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of ducts and internal protrusible sac as usual. Cerci not very long, each with a long apical and shorter dorsopreapical sinuate hair; ventropreapical hair strongly reduced, minute.

Preimaginal stages: OKELY (1974: 52, Figs. 37, 38, 43) described and illustrated the puparium of this species. It is very similar to those of other members of the *S. clunipes* and *S. talparum* groups and is barely distinguishable from them (cf. OKELY, 1974: 47).

Discussion: The species is relegable to *S. talparum*-group (see the configuration of the aedeagal complex) but is readily separable from all European species of *Spelobia* s. str. by its very small eyes, distinctive t_2 chaetotaxy (Fig. 519), relatively small thorax, wing polymorphism, long *T1+2* with very large pale pigmented medial area and by shape and armature of periandrium, telomere, and by shortened female postabdomen with divided *T8* and simple spectacles-shaped sclerite.

The species is very distinctive and was correctly recognized by previous authors; despite this its identity has been verified by examination of the male holotype.

Biology: *S. pseudonivalis* is a specialized microcavernicolous species (reduced eyes, prolonged arista and legs, reduced wings), incapable of flight. It was classified by HACKMAN (1967a) as an eucoenic species in burrows of small mammals, especially in nests of mole (*Talpa europaea*). SCHMITZ (1917), FALCOZ (1921), RICHARDS (1930, 1951) and HACKMAN (1964, 1965b) also recorded it from mole's burrows. OKELY (1974) bred it from decaying grass exposed in rabbit burrows. The species has also been obtained by the soil trap method (MOHRIG, 1967; ROHÁČEK, 1975a, 1980). I have collected it by sifting leaves by runs of small rodents (*Clethrionomys*,, *Apodemus*) in woods, but only rarely. Adults were found in II–XII (combined data of above authors and material examined) and the species probably develops continuously during the whole year. The wing polymorphism of this species was discovered by ROHÁČEK (1980); the submacropterous form (wings not reaching beyond end of abdomen) is rarer than the brachypterous form.

Distribution: Known only from Central Europe in broader sense. Hitherto recorded from GB: England (RICHARDS, 1930, 1976; OKELY, 1974), France (FALCOZ, 1921; SÉGUY, 1934), The Netherlands (SCHMITZ, 1917; DUDA, 1918), GDR (DAHL, 1909; MOHRIG, 1967), Czechoslovakia (ROHÁČEK, 1975a, 1978b, 1980) and South Sweden (HACKMAN, 1967a).

Spelobia (Spelobia) villosa (DUDA, 1918), **comb. nov.**

(Figs. 536–549)

Limosina (*Scotophilella*) *villosa* DUDA, 1918: 173
Leptocera (*Scotophilella*) *villosa*: DUDA, 1925: 163 (key)
Limosina (*Limosina*) *villosa*: DUDA, 1938: 151
Limosina villosa: PAPP, 1973c: 55 (key)

Type material: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "Creta BIRÓ", "Canea 1906. III.", "*villosa* ♀ det. O. DUDA" (TMB). Paralectotypes: 2 ♀ labelled as lectotype but with "Canea 1906. II" label; 2 ♂ 1 ♀ labelled: "Kréta Canea BIRÓ 1906. III. 6", "6. 3. 06 Canea", "*L. villosa* DUDA det. O. DUDA" and "*villosa* det. O. DUDA"; 2 ♀ with labels: "Kréta Canea BIRÓ 1906. III. 6" and "*L. villosa* DUDA det. O. DUDA" (1 ♂ 1 ♀ paralectotypes in JRO, others in TMB). Some of the paralectotypes have wings broken.

Material examined (besides "Type material"): 2 ♂ 3 ♀

FRG: 3 ♀ (ZMB) – Westfalen: Sinsen (DUDA leg.).

Tunisia: 1 ♂ (TMB) – Maktar env. (GOZMÁNY, MAHUNKA leg.).

Palestine: 1 ♂ (ZMB) – Reheboth nr. Jaffa (AHARONI leg.).

Description:

Male. Total body length 2.10–2.30 mm, general colour dark to blackish brown, greyish brown dusted. Head brown. Frons posteriorly and occiput blackish brown; anterior part of frons yellowish or reddish brown. Frontal triangle narrow and rather shining. Orbits, interfrontalia and ocellar triangle silvery grey pollinose. *pvt* well developed, in front of them a smaller pair of convergent false *pvt*. 4–5 *if*, the most anterior usually smaller. 4–7 small *ads* inside and below *ors*. Frontal lunule yellowish brown, yellowish grey dusted. Facial cavity dark brown, subshining; face relatively broad, yellowish brown, gena dark reddish brown. *g* well developed, behind it a row of 2 shorter setae. Some minute hairs on face also present but less well developed than in *S. simplicipes*. Eye of medium size, its diameter about 2.3–2.5 times the narrowest genal width. Antennae brown to reddish (especially internal part of 3rd segment). Arista about 3.0 times as long as antenna, moderately long but rather densely haired.

Thorax blackish brown, greyish brown pollinose, subshining. Mesonotum more shining than the pleurae. Humeral callus with an additional anteroexternal microseta besides the 2 usual *hu*. 2 *dc*, the posterior long; usually 10 rows of *ac* hairs; the prescutellar medial *ac* pair strongly enlarged, as long as the anterior *dc*. Pleurae with yellowish sutures between pleural sclerites and 2 *stpl*. Scutellum elongate triangular, comparatively large; *sc* long. Legs brown to reddish brown, coxae, trochanters, knees and tarsi somewhat paler. t_1 simple, unmodified, f_1 and f_3 slightly thickened, t_3 slightly curved (as in *S. simplicipes*). t_2 chaetotaxy (Figs. 548, 549) very similar to that of *S. simplicipes* but *av* below middle longer. mt_2 ventrally with a more or less distinctly enlarged seta usually about twice as long as other setulae. Ratio $t_2 : mt_2 = 2.00–2.31$. Wing (Fig. 536) very pale yellowish brown, veins yellowish brown, *C* brown and hardly overpassing R_{4+5}. Cs_1 relatively long haired. R_{4+5} not perfectly straight but apically very slightly bent up to *C*. Discal cell of medium length and broad, with short appendages of M_{1+2} and M_{3+4}; both outer corners of discal cell obtuse-angled. Alula large, broad, rounded. Wing measurements: length 2.06–2.22 mm, width 0.83–0.99 mm, *C*-index = 1.10–1.18, $t_a – t_p : t_p = 1.94–2.36$. Halteres pale yellow.

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Abdomen blackish brown, greyish brown pollinose, subshining. *T1+2* with medial basal weakly sclerotized and pale pigmented area, in dry specimens impressed. Terga strikingly long haired on lateral margins, shorter setulose on disc. Sterna more densely haired. *S5* (Fig. 541) densely shortly haired and in front of the medial posterior comb (consisting of spines with filiform tips — as in *S. baezi*), with medial group of short thick bristles and a number of small hook-like curved setae.

Genitalia. Periandrium (Figs. 539, 540) unusually densely and shortly haired, without any longer bristle. Cerci each with one longer sinuate hair and some small setulae. Hypandrium of medium length. Telomere large (Fig. 538), with robust and long ventral spine and micropubescence only on its upper part. Aedeagal complex (Fig. 537) with robust, compact phallophore; distiphallus with dorsopreapical projection having 2 finely serrate keels. Postgonite long, slightly curved,with some minute setulae and apex shortly pointed. Ejaculatory apodeme small, in profile S-shaped.

Female. Similar to male except for the differences mentioned below. Total body length 2.10—2.42 mm. f_1 and f_3 slender. t_2 with longer bristles, especially *va*. Ratio $t_2 : mt_2 = 1.94—2.23$. Wing measurements: length 1.98—2.46, width 0.83 to 1.03 mm, *C*-index = 1.04—1.25, $t_a—t_p : t_p = 2.23—2.36$. Preabdomen very long haired.

Postabdomen (Figs. 542—544) short. *T6* much wider than *T7*, with very long and robust bristles (as preabdominal terga). *T7* simple. *T8* medially very shortened and anteriorly broadly incised, laterally extended but not divided. *T9* short, roughly triangular, with 2 long dorsal hair-like setae. *S7* transverse, wide. *S8* narrower than *S7*, with only short setae. *S9* shortly triangular, with short setae (2 medial longer) and pigmented as in Fig. 544. Spectacles-shaped sclerite (Figs. 546, 547) ill-defined, very weakly sclerotized and pale pigmented. Spermathecae (Fig. 545) comparatively very large, tyre-shaped, with 2 basal grooves, enlarged and conically thickened sclerotized terminal parts of ducts and protrusible internal sac. Cerci besides longer apical and dorsopreapical sinuate hairs with short setae (also the ventropreapical hair strikingly short).

Discussion: *S. villosa* (DUDA) resembles the species of the *S. simplicipes*-group in having similar t_2 chaetotaxy, large and broad alula, long medial prescutellar *ac* and simple t_1 of the male, but is distinguished by very long bristles on abdominal terga (*T1+2—T5*, in female also *T6*), apically slightly curved R_{4+5} and shortly setulose periandrium without long hair-like bristle. Also some features of the male and female terminalia are characteristic (telomere with long ventral spine and robust anterior part, dorsomedial preapical projection of distiphallus, simple female *S8*, shortly haired female cerci, very robust and basally grooved spermathecae). Some details of the genitalia, e.g. the aedeagal complex and posterior part of telomere indicate the affinity of *S. villosa* to the *S. simplicipes*-group, mainly to *S. quaesita* spec. nov. but the simple shape of female *S8* demonstrates that it is more primitive and apparently evolved from the same ancestor as the *S. clunipes*-group.

The identity of *S. villosa* has been confirmed by revision of the type material. *Leptocera* (*Limosina*) *hungarica* VILLENEUVE, 1917, might be conspecific (or with *S. simplicipes* DUDA) but the type material has not been traced (probably lost) and the species is not recognizable from the original description. Therefore I consider it provisionally as species dubia (see. p. 158), but without doubt belonging to *Spelobia* s. str.

Biology: Hitherto poorly known. DUDA (1918) refer to its occurrence on house windows, in woods and on *Ateuchus variolosus* (in Crete), PAPP (1973b, 1976b, 1977b) notes a number of specimens caught on horse droppings or swept near them and PAPP (1978c) some specimens found at light. The dates of occurrence are from II—V, VIII (combined data of above authors and material examined).

Distribution: Probably a Mediterranean species recorded from Balearic Is. (PAPP, 1973b, 1976b), Italy (DUDA, 1938), Crete (DUDA, 1918), Tunisia (PAPP, 1977b, 1978c), Palestine (DUDA, 1938), Hungary (PAPP, 1973c) and FRG, GDR and Denmark (Bornholm — DUDA, 1918, 1938). The latter 3 records (DUDA, 1938 refers about mass-occurrence in Westfalen) are especially noteworthy but in all probability they refer to non-autochthonous populations originating from specimens introduced from the Mediterranean by human activity because this species is very rare in Hungary (PAPP, 1973c) and was not found in Czechoslovakia until the present work. However there is another less probable explanation of such a distribution. The species might naturally be distributed along the Mediterranean and Atlantic littorals up to N. Germany and Denmark. This, however, presumes that *S. villosa* will be found also on the shores of Spain, France, Belgium etc.

Spelobia (Spelobia) quaesita spec. nov.

(Figs. 550, 551, 554—562)

Type material: Holotype ♂: Spain, Salou nr. Tarragona, 7. 5. 1979, on human excrement, J. ROHÁČEK leg. Allotype ♀: Spain, Güejar Sierra nr. Granada, 13. 5. 1979, sweeping by stream, J. ROHÁČEK leg.; paratypes: 1 ♂ 1 ♀ with same data as for allotype; 2 ♂ Spain, Grazalema nr. Ronda, 16.—17. 5. 1979, sweeping over meadow; 2 ♂ 1 ♀ same locality, sweeping by stream, all J. ROHÁČEK leg. (JRO, TMB).

Description:

Male. Total body length 1.82—2.34 mm, general colour dark brown to blackish brown, greyish brown pollinose, subshining. Head brown. Frons pale brown anteriorly and blackish brown posteriorly. A very narrow frontal triangle, ocellar triangle, interfrontalia and also orbits partly silvery grey dusted and slightly glittering; the rest of frons brown to black (posteriorly), dusted and dull. 2 pairs of *pvt* (as in *S. simplicipes*), the anterior false pair small but more convergent. 4—5

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comparatively long *if* of about equal length, or the most anterior shorter. 4–6 small *ads* inside and below *ors*. Frontal lunule basally and face paler brown, gena brown, all greyish brown pollinose. Facial cavity brownish black and despite some pollination rather shining. Face with some minute hairs; gena besides *g* of medium length with about 3 shorter setulae behind it. Eye not very large, its diameter only 2.3 times the narrowest genal width. Antennae blackish, 2nd segment often brown. Arista about 3.1 times as long as antenna, with ciliation of medium length.

Thorax dark brown, greyish brown pollinose, mesonotum subshining, pleurae duller. 2 *hu*, the internal smaller but relatively robust; also an additional anteroexternal microseta present on humeral callus. 2 *dc*, the anterior short. 8–10 rows of *ac* microsetae between anterior *dc*; the medial prescutellar *ac* pair distinctly enlarged and often longer than anterior *dc*. Scutellum elongate triangular, *sc* long. Pleurae with yellowish brown sutures between sclerites. 2 *stpl*, also the anterior relatively long (more than half length of the posterior *stpl*) but thin. Legs brown, fore coxa, trochanters and knees somewhat paler. t_1 simple, t_2 chaetotaxy as in Figs. 550, 551, thus similar to that of *S. simplicipes*. t_3 very slightly curved and with paired ventropreapical short setae as in related species. Ratio t_2: mt_2 = 1.93–2.00. mt_2 with somewhat enlarged seta in the *pv* row of setulae. Wing (Fig. 554) with very pale greyish brown membrane, veins pale yellowish brown, *C* darker brown. *C* not or indistinctly extended beyond R_{4+5}. R_{4+5} straight, at most apically indistinctly bent up to *C*. Discal cell of medium length, with short appendages of M_{1+2} and M_{3+4}, the first being continued by colourless fold parallel to R_{4+5}. Alula large, broad. Wing measurements: length 1.68–2.04 mm, width 0.71–0.85 mm, *C*-index = 1.19–1.42, t_a–t_p: t_p = 2.40–2.80. Halteres yellow.

Abdomen blackish brown, greyish brown pollinose, subshining. Terga sparsely but comparatively long haired in posterolateral corners. Sterna densely and shortly haired. *T1+2* with large dorsomedial basal weakly sclerotized and pale pigmented area. *S5* (Fig. 555) similar to that of *S. simplicipes*, with fivefold posteromedial comb of spines (only 2 most posterior rows complete, the others medially divided) and with a group of thick, short, spine-like bristles in the middle, the most posteriorly situated pair of them distinctly larger than others. Pigmentation as in *S. simplicipes*.

Genitalia. Periandrium as in *S. simplicipes*, thus with a long dorsolateral bristle, somewhat shorter lateral and laterocaudal bristles. Cerci simple, each with a long hair-like bristle (longer than in *S. simplicipes* on the average) and a group of short setulae. Hypandrium as in *S. simplicipes*. Telomere (Fig. 556) distinctive, anterior part similar to that of *S. simplicipes* but posterior part different, robust, projecting ventrally and shortly pointed. Almost entire outer side of telomere covered by micropubescence except for the posterior ventral projection. Ventral spine somewhat longer than that of *S. simplicipes*. Aedeagal complex (Fig. 557) with only distiphallus similar to that of *S. simplicipes* (including the medial dorsopreapical projection) but the phallophore is smaller and postgonite more simple. Ejaculatory apodeme present but small.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.82–2.06 mm. t_3 very slightly curved. Ratio t_2: mt_2 = 1.85–1.97. Wing measurements: length 1.78–1.98 mm, width 0.73–0.81 mm, *C*-index = 1.37–1.43, t_a–t_p: t_p = 2.28–2.82. Preabdomen as in male.

Postabdomen (Figs. 558–560). *T6* and *T7* simple. *T8* medially membraneous and pale pigmented but not completely divided; lateral parts enlarged and somewhat projecting also ventrally. *T9* triangular and comparatively long, large and, in contrast to that of *S. simplicipes*, with only 2 dorsal setae. *S6* and *S7* simple. *S8* characteristic, projecting posteroventrally and much larger than that of *S. simplicipes*; the posteroventral protuberance with 2 long sinuate hairs and a number of small setulae. *S9* comparatively large, flat, differently haired than that of *S. simplicipes*. Spectacles-shaped sclerite (Fig. 562) with narrower and more medially situated circles. The medial perpendicular sclerotized plate larger than in *S. simplicipes*. Spermathecae (Fig. 561) tyre-shaped, with grooved bodies and short, conically dilated sclerotized terminal parts of ducts. Cerci much more slender than in *S. simplicipes*, with comparatively short hairs; the apical the longest and slightly sinuate and the dorsopreapical distinctly thickened and straight.

Discussion: The species is closely related to *S. simplicipes* (DUDA) and forms with it a separate species-group which superficially resembles the *S. clunipes*-group (t_2 chaetotaxy, long prescutellar medial *ac*, wing, periandrium) but is characterized by peculiar male *S5* with fivefold comb of spines, posteroventrally projecting telomere, distiphallus with serrate dorsomedial preapical projection, large female *T9* and *S9* and characteristic, posteroventrally protruding female *S8* and grooved tyre-shaped spermathecae with short sclerotized parts of ducts. *S. quaesita* spec. nov. seems to be more primitive and indicate the possible origin of the *S. simplicipes*-group from an ancestor resembling *S. villosa* (cf. aedeagal complex) or *S. pseudosetaria*-group (cf. female *S8* of *S. rufilabris*, *S. luteilabris*).

S. quaesita spec. nov. can be easily distinguished from *S. simplicipes* by a number of features in the male and female postabdomen (telomere, phallophore, postgonite, female *T8*, *T9*, *S7* without small pale posterior area, *S8*, more slender cerci).

Biology: The holotype was caught on human excrement; all other specimens were swept from vegetation mostly along streams, in V, from about 80 up to 1,000 m. Although the biology of this species and of *S. simplicipes* is very poorly known, it is presumed that these species are very similar in this respect and may by considered as vicarious species in various parts of the Mediterranean Region (see below).

Distribution: South Spain. Because *S. simplicipes* has not been found in Spain up to the present, it is probable that *S. quaesita* spec. nov. replaces this Ponto-submediterranean species in the west Mediterranean. The most western record of *S. simplicipes* is from Balearic Is. (PAPP, 1973b, 1976b) but it is not impossible that it is really *S. quaesita* spec. nov. Other records of *S. simplicipes* are from much more eastern localities (see under *S. simplicipes*).

Spelobia (Spelobia) simplicipes (DUDA, 1925), **comb. nov.**

(Figs. 552, 553, 563–574)

Leptocera (*Scotophilella*) *simplicipes* DUDA, 1925: 188 (nom. n. for *L. simplicimana* DUDA nec RONDANI, 1880)
Limosina (*Limosina*) *simplicipes*: DUDA, 1938: 147

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Leptocera (*Limosina*) *simplicipes*: DEEMING, 1966: 280
Limosina simplicipes: PAPP, 1973c: 58 (key)
Leptocera simplicis: NARTSHUK, 1970: 351 (key, lapsus)
Limosina (*Scotophilella*) *simplicimana* DUDA, 1918: 175; 1924 b: 164 nec RONDANI, 1880
Leptocera (*Scotophilella*) *simplicimana*: DUDA, 1925: 163 (key)

Type material:
Limosina (*Scotophilella*) *simplicimana* DUDA: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "Creta BIRÓ", "Canea 1906. II." and "*simplicimana* ♀ det. O. DUDA"; paralectotypes: 1 ♂ labelled: "Tunisia Bel. Mehtia", "1913. VIII. 30" and "*simplicimana* ♂ det. O. DUDA", 1 ♀ labelled: "Verestorony KERTÉSZ", "1910. VI. 9" and "*simplicimana* ♀ det. O. DUDA" (TMB).

Material examined (besides "Type material"): 5 ♂ 6 ♀

FRG: 2 ♂ 1 ♀ (ZMB) — Westfalen: Sinsen, Herten (DUDA leg.).

Czechoslovakia: 1 ♂ 4 ♀ (JRO) — Slovakia: Slov. Kras-Plešivecká planina, Kečovo (ROHÁČEK leg.).

Hungary: 1 ♂ 1 ♀ (JRO) — Vérteskozma (ZSIRKÓ leg.), Csákvár-Hajduvágás (MIHÁLYI leg.).

Tunisia: 1 ♂ (ZMB) — without locality (BIRÓ leg.).

Description:
Male. Total body length 1.82—2.18 mm, general colour brown, brownish grey pollinose, subshining. Head brown. Frons with broad, yellow to yellowish brown anterior margin; rest of frons dark brown, dull but a narrow frontal triangle, interfrontalia, orbits and occiput silvery pollinose and shining. Stripes between frontal triangle, interfrontalia and orbits posteriorly darkened, almost black and dull. Cephalic bristles stout. *pvt* well developed, in 2 pairs, the anterior false pair smaller. 4—5 *if*, the most anterior somewhat smaller. 5—7 distinct *ads* inside and below *ors*. Frontal lunule pale yellowish brown and yellowish grey dusted. Face pale yellowish brown, gena and facial cavity dark brown and greyish brown dusted, rather dull. Face with 5—6 small hairs in front of eye margin, gena with long *g*, 2—3 short setulae behind it, and dense peristomal hairs. Eye not very large, its diameter only about 2.6—2.8 times the narrowest genal width. Antennae brown, basal segments usually reddish brown, 3rd segment darker and shortly pale pilose. Arista 3.2 times as long as antenna, relatively long ciliate.

Thorax brown, mesonotum sparsely greyish brown pollinose and rather shining, pleurae with pale yellowish brown sutures between pleural sclerites, more heavily dusted and duller. 2 *hu*, the internal smaller, the external long. 2 *dc*, the anterior short. 10 (rarely 8) rows of *ac* microsetae between anterior *dc*, the medial prescutellar *ac* pair very long, longer than anterior *dc* and sometimes almost as long as posterior *dc*. 2 *stpl*, the posterior very long. Scutellum elongate triangular with long *sc*. Legs brown or reddish brown, coxae, trochanters, knees and tarsi usually paler, yellowish brown. All legs densely shortly haired. Fore tarsus slender, t_1 simple, slender. t_2 chaetotaxy (Figs. 552, 553) similar to *S. clunipes*. f_3 slightly thickened and t_3 somewhat curved (as in *S. faeroensis* — see Fig. 483). Ratio $t_2 : mt_2 = 2.09—2.31$. Wing (Fig. 563) pale yellowish brown, veins pale brown, *C* the darkest. Cs_1 comparatively long haired. *C* not extended beyond R_{4+5}, the latter almost straight or indistinctly curved up to *C*. Discal cell of medium length, rather broad and with short processes of M_{1+2} and M_{3+4} beyond t_p, that of M_{1+2} continued by colourless venal fold parallel to R_{4+5}. Alula large, broad and rounded. Wing measurements: length 1.87—2.22 mm, width 0.79—0.95 mm, *C*-index = 1.35—1.71, $t_a - t_p : t_p = 2.12—2.42$. Halteres pale yellow.

Abdomen brown to blackish brown, terga shining despite some greyish brown pollination, periandrium more heavily greyish pruinose. Terga sparsely and shortly haired, *T5* with long bristles on posterior margin. Sterna more densely pruinose and haired. *T1+2* basally medially with weakly sclerotized and pale pigmented area, in dry specimens impressed. *S5* (Fig. 568) similar to that of *S. quaesita* spec. nov., with posterior fivefold comb of spines (the anterior rows of spines incomplete) and group of short thick spines in front of it; the pigmentation also distinctive.

Genitalia. Periandrium (Figs. 566, 567) with a long dorsolateral, lateral and laterocaudal hair-like bristles. Cerci each with a longer caudal hair and a number of minute setae. Hypandrium of medium length, with flattened lateral margins. Telomere (Fig. 565) unique in its posterior, slender, long, lancet-shaped projection and rhomboid anterior part. The ventral spine of medium length and micropubescence on almost the entire outer side except for the most anterior margin and the posterior projection. Aedeagal complex (Fig. 564) with unusually robust, compact phallophore, longer than distiphallus. Distiphallus with double serrate dorsal arch-shaped projection. Postgonite large, apically slightly bent and enlarged, with 3 setulae on anterior margin. Ejaculatory apodeme not found.

Female. Similar to male but differs as follows. Total body length 1.95—2.38 mm. t_2 chaetotaxy as in male but the bristles a little longer. t_3 less curved. Ratio $t_2 : mt_2 = 1.90—2.05$. Wing measurements: length 1.91—2.14 mm, width 0.75—0.93 mm, *C*-index = 1.18—1.56. $t_a - t_p : t_p = 2.19—2.85$. Abdomen with longest bristles on posterior margins of *T5* and *T6*.

Postabdomen (Fig. 569—571) pruinose but *T8* and *T9* glabrous and lustrous. *T8* laterally extended but medially not divided and simply pigmented. *T9* flat, rather long, with 4 bristles on protruding central part. *S6* simple, transverse, densely haired. *S7* larger and posteromedially with a small unpigmented area. *S8* unusually short, reduced, somewhat protruding posteroventrally, with 3—4 bristles. *S9* flat, rather long, densely shortly haired besides some longer setulae on posterior margin. Spectacles-shaped sclerite (Figs. 573, 574) wide, pale, weakly sclerotized. Spermathecae (Fig. 572) tyre-shaped, with grooved surface, conically dilated short terminal parts of ducts and protrusible internal sac. Cerci short, rather shortly haired, also apical sinuate hair relatively short.

Discussion: The species forms with *S. quaesita* spec. nov. a separate species-group (see p. 81). It differs from *S. quaesita* spec. nov. mainly by the features given in the key and in the discussion.

DUDA (1918) described the above species as *Limosina simplicimana* but this name is preoccupied by *Limosina simplicimana* RONDANI, 1880, and therefore DUDA (1925) introduced a new name *Leptocera simplicipes*. Because no type material for *S. simplicipes* was designated by DUDA (1925) it is necessary to consider as such the above mentioned type material of *L. simplicimana* DUDA, 1918.

Biology: Very little known species. The adults were usually collected on excrement of various kinds (human, horse, sheep) or swept from vegetation (DEEMING, 1966; PAPP, 1973b, 1976b). Occurrence dates ranges between II and XII (combined data of PAPP, 1973c and material examined).

Distribution: The species is probably of Ponto-submediterranean or even South Palaearctic distribution but only rarely penetrates to Central Europe. Besides Europe it

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was reported from Tunisia (DUDA, 1918), USSR: Kirghizia (DEEMING, 1966), Tadzhikistan (PAPP, 1979a) and from Afghanistan (HACKMAN, 1969c). There are European records from Balearic Is. (PAPP, 1973b, 1976b), Corsica, Crete (DUDA, 1918), Italy (DEEMING, 1966), Jugoslavia (DUDA, 1918), Hungary (DUDA, 1918; MIHÁLYI, 1967; PAPP, 1973c), Austria (DEEMING, 1966), Czechoslovakia (ROHÁČEK, 1978b) and FRG (DUDA, 1938).

Spelobia (Spelobia) pseudosetaria (DUDA, 1918), comb. nov.

(Figs. 575–590)

Limosina (Scotophilella) pseudosetaria DUDA, 1918: 178
Leptocera (Scotophilella) pseudosetaria: DUDA, 1925: 161 (key)
Limosina (Limosina) pseudosetaria: DUDA, 1938: 141
Limosina penetralis COLLIN, 1925: 333; PAPP, 1973c: 61 (key)
Leptocera (Limosina) penetralis: RICHARDS, 1930: 304
Limosina (Limosina) penetralis: DUDA, 1938: 138
Leptocera penetralis: NARTSHUK, 1970: 349 (key)

Type material:
Limosina (Scotophilella) pseudosetaria DUDA: Holotype ♂ labelled: "4 6 16", "*pseudosetaria* m. ♂ det. DUDA" (ZMB, examined). The specimen is without locality label but according to DUDA (1918) originates from Eikel (FRG). Abdomen detached, dissected and preserved in a plastic tube in glycerine pinned below specimen.
Limosina penetralis COLLIN: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "Oxf. Univ. Arct. Expd., 1924 On 'Polar Bjorn', N. Sea, between Newcastle and Norway", "C3 Jun. 21. 1924, C. S. ELTON. Crawling on wals of hold & herring refuse", "♂ *Limosina penetralis* COLLIN. J. E. COLLIN, Ann. Mag. N. H., Jul. 1925 p. 332"; paralectotypes: 1 ♀ with same data as for lectotype; 1 ♂ labelled: "Oxf. Univ. Arct. Expd., 1924. On 'Polar Bjorn', on Norway Coast", "C 21, Jun. 27. 1924, C. S. ELTON. On beam of hold", "A in cop. with B", det. label as for lectotype; 1 ♀ with same data as for male paralectotype but with "B in cop. with A" label (all UMO). Further specimens belonging to type series are also in UMO (not examined).

Material examined (besides "Type material"): 30 ♂ 63 ♀

Spain: 6 ♂ 6 ♀ (JRO) — Tortosa env., Cullar de Baza env., Sierra Nevada-Llano Prado (ROHÁČEK leg.).

GB: 3 ♂ 1 ♀ (UMO) — England: Oxford (HAMM leg.); Surrey: Kew (COLLIN leg.); Sussex: Newmarket (COLLIN leg.); Lancashire: Grange-over-Sands (WRIGHT leg.).

Czechoslovakia: 18 ♂ 38 ♀ (JRO, SMO, NMP, VUP) — Bohemia: Cheb (KOWARZ leg.), Břežany nr. Benešov (KOVÁŘ leg.), Praha-Libuš (ZUSKA leg.), Kralupy (PULPÁN leg.), Lysá n. L. (ZUSKA leg.), Palupín nr. Strmilov (ROHÁČEK leg.);
Moravia: Třešť, Otín nr. Stonařov, Mor. Krumlov, Mor. Kras-Pekárna (cave) (ROHÁČEK leg.), Pohořelice (MOCEK leg.), Valtice, Hartínkov, Úvalenské louky (distr. Opava), H. Jeseník Mts.-Skřítek (ROHÁČEK leg.), Spálené (BORŮVKA leg.);
Slovakia: Patince nr. Komárno, Turček, Kečovo, Levočské poh. Mts.-Sivá Brada (ROHÁČEK leg.).

Austria: 8 ♀ (IZI) — Tyrol: Obergurgl Mt., Hohe Tauern-Badgastein (TROGER, STOCKNER leg.).

Roumania: 1 ♂ (IZS) — Mangalia-Doi Mai (CHVÁLA leg.).

Denmark: 1 ♂ 5 ♀ (ZMK) — NWJ: Nors-Hykjaer (LYNEBORG, OVERGAARD leg.); NEZ: København (LUNDBECK leg.), Holte (MORTENSEN leg.).

Sweden: 1 ♀ (ZIL) — Ly. Lpm.: Stensele (ZETTERSTEDT leg.).

Finland: 1 ♂ 4 ♀ (ZMH) — N: Helsinki (FREY leg.), Borgå-Seitlax (NORDMAN leg.); Ta: Lammi (HACKMAN leg.); Le: Enontekis (FREY leg.); Li: Utsjoki (FREY leg.).

Description:
Male. Total body length 1.54–1.99 mm, general colour blackish brown, brown to greyish brown pollinose and subshining. Head blackish brown. Frons brownish black, its anterior margin often rather paler brown. Frontal triangle long and rather shining; interfrontalia, orbits and ocellar triangle silvery grey dusted and somewhat glittering, the rest of frons blackish grey dusted and dull. *pvt* in 2–3 pairs but only the most posterior pair represents the true *pvt*; 1–2 pairs of convergent setae in front of it are false *pvt*. 4–6 (rarely 7) *if*, 3–4 middle larger, the most anterior and posterior usually smaller. 3–5 minute *ads* inside and below *ors*. Frontal lunule, facial cavity, face and gena brown to blackish brown. *g* moderate, about as long as the most anterior peristomal seta; usually 2 additional small setae behind *g*. Eye not very large, its diameter about 2.3 times the narrowest genal width. Antennae blackish brown to black; arista about 3.3 times as long as antenna, its ciliation of medium length.

Thorax brownish black, brown dusted. Mesonotum despite the pruinosity shining, pleurae duller. 2 *hu*, the internal small. 2 *dc*, also the anterior rather long and robust. 8–10 rows of *ac* hairs between anterior *dc*; the medial prescutellar *ac* pair weakly enlarged. Scutellum long, roundly triangular, *sc* long. Pleurae with yellowish brown sutures. 2 *stpl*, the posterior long, the anterior small. Legs brown, trochanters and knees paler, femora darker. t_2 chaetotaxy (Fig. 578, 579), distal long bristles on dorsal side more or less paired. mt_2 with *pv* row of weak setulae, t_3 very slightly curved and very rarely with dorsopreapical seta (in atavistic mutants — see Fig. 577). Ratio $t_2 : mt_2 = 1.88–2.03$. Wing (Fig. 580) pale brownish, veins brown. *C* not or indistinctly extending beyond R_{4+5}. R_{4+5} straight or very slightly bent to *C*. Discal cell of medium length, with short pigmented processes of M_{1+2} and M_{3+4} beyond t_p. The colourless fold continuing M_{1+2} very slightly divergent from R_{4+5}. Alula large but rather narrow, apically rounded. Wing measurements: length 1.54–1.95 mm, width 0.67 to 0.87 mm, *C*-index = 1.12–1.27, $t_a – t_p : t_p = 2.14–2.66$. Halteres with pale yellowish brown stem and darker, greyish brown knob.

Abdomen dark brown, greyish brown pollinose, subshining. Terga sparsely haired, only laterally with somewhat longer bristles. Sterna shortly haired. *T1+2* with small, basal, weakly sclerotized and pale pigmented medial area. *S4* simple but in contrast to all related species with a short posteromedial of small spines (Fig. 576). *S5* (Fig. 575) posteromedially with a simple comb of small spines; these spines pointed and medially and laterally longer. There are 2 groups of thick, short, inclinate and often apically hook-like curved spines in the middle of *S5*. Pigmentation also rather diagnostic, especially the dark triangular spot in front of posteromedial comb of spines.

Genitalia. Periandrium (Figs. 581, 582) sparsely haired, dorsolaterally with a long, hair-like bristle. Cerci distinct, each with a longer hair and 1 small setula. Hypandrium of medium length. Telomere (Fig. 583) robust and rather wide, with compact and robust anterior part, micropubescence on almost entire outer side, rich setiform hairs posteroventrally and short, thick, shortly pointed ventral spine. Aedeagal complex (Fig. 582) similar to that of related species, with large, compact and simple phallophore; distiphallus with dorsally tuberculate dorsopreapical projection and somewhat tuberculate apex. Postgonite long, slender, slightly S-shaped and not very pointed, with about 3 minute setulae on outer side. Ejaculatory apodeme probably absent.

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Female. Similar to male but differs as follows. Total body length 1.75–2.14 mm. Legs longer and more slender, *av* below middle of t_2 usually longer. t_3 straighter. Ratio t_2: mt_2: = 1.89–1.96. Wing measurements: length 1.65–1.99 mm, width 0.67–0.85 mm, *C*-index = 1.16–1.35, t_a–t_p: t_p = 2.07–2.58. Preabdominal sterna somewhat more densely haired. *S4* and *S5* simple.

Postabdomen (Figs. 585–587). *T6* rather long, longer than *T7* which is dorsomedially shortened. *T8* divided into 2 plates, dorsally separated by a narrow membraneous space. *T9* comparatively large, shortly triangular, with 2 usual dorsal setulae arranged somewhat laterally. *S6* and *S7* simple, densely haired, the latter with 4 longer bristles on posterior margin. *S8* rather characteristic, with anterior, dark pigmented, transverse stripe and posterior part with medial, somewhat protruding anterior convexity carrying 2 longer setae. *S9* comparatively large, medially with 2 dark longitudinal bands, each bearing 2 setulae. Spectacles-shaped sclerite (Figs. 589, 590) simple; its medial part with 2 darkly pigmented wing-shaped sclerites, circles elongate, rather semicircular. Spermathecae (Fig. 588) distinctive, tyre-shaped, with protrusible internal sac, characteristically grooved bodies and rather long, terminally slender sclerotized parts of ducts. Cerci rather robust, each with a longer sinuate apical, shorter dorso- and ventropreapical and 2 small lateral hairs.

Preimaginal stages: Anterior and posterior part of puparium was figured by RICHARDS (1930, Pl. 1, Figs. 9, 10). I resembles those of other *Spelobia* s. str. species.

Discussion: *S. pseudosetaria* (DUDA) belongs to a large and very difficult group of species comprising the 4 following species and a number of further Palaearctic species described by PAPP (1973a, 1974d, 1978a) from Mongolia and Afghanistan. This group is defined by t_2 possessing dorsally paired distal long bristles and wing with narrow alula. There are also some resemblances in the male and female terminalia, but these characters are insufficiently known in the recently described extra-European taxa (I propose not to describe species in this group from females only in the future). *S. pseudosetaria* is a rather easily recognizable species differing from all European relatives by the small posteromedial row of spines on male *S4*, pigmentation and armature of male *S5*, low, robust telomere with short and thick ventral spine and grooved spermathecae. Also the shape of female *S8* and spectacles-shaped sclerite is rather characteristic. *S. ulla* spec. nov. most closely resembles *S. pseudosetaria* in outer appearance but it has only 3 *if*, only 1 *ad* proximal bristle on t_2 and quite different male genitalia and *S5*.

S. pseudosetaria (DUDA) was described from a unique male differing from all related species by possessing a dorsopreapical hair on t_3. No further specimens were discovered up to the present. Having examined the male holotype (ZMB) I dissected its genitalia and found it to be conspecific with *Limosina penetralis* COLLIN, 1925, and differing from it only by the above seta on t_3. The holotype of *S. pseudosetaria* is apparently a mutant specimen, and the presence of a dorsopreapical seta on t_3 must be considered as an atavistic feature (such seta on t_3 is a regular feature of the more primitive subfamily Copromyzinae and rarely persists in some Limosininae, viz. *Limosina silvatica*, *Xenolimosina setaria*, *Kimosina empirica*) very sporadically occurring among normal specimens. Thus, *Limosina penetralis* COLLIN, 1925, is a synonym of *S. pseudosetaria* (DUDA, 1918) which is rather paradoxical considering that it was named after a feature which it normally lacks. (ROHÁČEK, 1981).

Biology: The species is probably phytosaprophagous (bred from vegetable refuse) and is more or less confined to human settlements forming successful synanthropic populations on various decaying refuse in refuse heaps, cellars and human dwellings (RICHARDS, 1930; PAPP, 1973c). I have collected it mainly on rotten vegetation but also on rabbit manure, on refuse and compost heaps and cellars. The species is clearly hemisynanthropic; RICHARDS (1930) even calls it "domestic" and ZUSKA & LAŠTOVKA (1969) recorded it from various food-processing buildings, especially in poultry farms, greengroceries and store-rooms. However, it also occurs more rarely outdoors, namely in caves and burrows of small mammals (VANSCHUYTBROECK, 1942; RICHARDS, 1961; HACKMAN, 1963a; PAPP & PLACHTER, 1976). I have also found some specimens in caves and in runs of *Microtus* spec., *Pitymys* spec. and in a rabbit burrow. Adults occur during II–XII (combined data of various authors and material examined).

Distribution: Probably a Palaearctic species but hitherto recorded only from Europe, USSR: Tadzhikistan (PAPP, 1979a) and Afghanistan (RICHARDS, 1961; PAPP, 1978a). In Europe known from Spain (HACKMAN, 1969b), GB: England, Scotland (RICHARDS, 1930, 1976), Belgium (VANSCHUYTBROECK, 1942), FRG (DUDA, 1918), Poland (PAX & MASCHKE, 1935), Czechoslovakia (PAX & MASCHKE, 1935; ZUSKA & LAŠTOVKA, 1969; ROHÁČEK, 1978b, 1980), Austria (TROGER & ROHÁČEK, 1980), Hungary (PAPP, 1973c; PAPP & PLACHTER, 1976), Roumania (material examined, new), Bulgaria (BESHOVSKI, 1967), Denmark, Sweden (material examined, new), Norway (COLLIN, 1925), Finland (HACKMAN, 1963a; PAPP, 1973b), USSR: Estonia, Lapland, Murmansk (PAPP, 1979a) — almost all

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published records under *L. penetralis* COLLIN. Because of its synanthropy, it can be expected that *S. pseudosetaria* will be introduced to further regions in future.

Spelobia (Spelobia) rufilabris (STENHAMMAR, 1854), comb. nov.

(Figs. 591–594, 598–604)

Limosina rufilabris STENHAMMAR, 1854: 408; ZETTERSTEDT, 1860: 6416; RONDANI, 1880: 25; PAPP, 1973c: 61 (key)
Limosina (Scotophilella) rufilabris: DUDA, 1918: 162
Leptocera (Scotophilella) rufilabris: DUDA, 1925: 164 (key)
Leptocera (Limosina) rufilabris: RICHARDS, 1930: 304
Leptocera rufilabris: SÉGUY, 1934: 469; NARTSHUK, 1970: 349 (key)
Limosina (Limosina) rufilabris: DUDA, 1938: 143

Type material: Lectotype ♂ (des. by ROHÁČEK in 1980) labelled: "Gttb" and located in the drawer *S23* (II) of STENHAMMAR's collection. Paralectotypes: 1 ♀ labelled: "Sc", "Bhn" and "Villn"; 2 ♂ unlabelled; all specimens located together with the lectotype (ZIU).

Material examined (besides "Type material"): 25 ♂ 21 ♀

Czechoslovakia: 9 ♂ 6 ♀ (JRO, SMO, NMP) – Bohemia: Cheb, Františkovy Lázně (KOWARZ leg.), Děčínský Sněžník (OŠMERA leg.); Moravia: Hnčvošice, Klokočov (distr. Opava), H. Jeseník Mts.-Jezerník, Skřítek, Kouty n. D. (ROHÁČEK leg.).

Austria: 3 ♂ 6 ♀ (IZI, JRO) – Tyrol: Obergurgl Mt., Hohe Tauern-Badgastein (TROGER, STOCKNER leg.).

Bulgaria: 3 ♂ 2 ♀ (IZS) – Rila Mts.-Musala Mt., Beklemeto-Trojan, Oranovo-Razloschko, Vasilashki (BESHOVSKI leg.)

Denmark: 1 ♂ 7 ♀ (ZMK) – EJ: Vorsø (TUXEN leg.); NEJ: Frederikshavn (HANSEN leg.); SZ: Vemmetofse (HANSEN leg.) NEZ: Geel Skov (MORTENSEN leg.), Praestevang (LUNDBECK leg.), Brordrup (LYNEBORG leg.), Hareskov (OVERGAARD leg.).

Finland: 8 ♂ (ZMH) – Ab: Nystad (HELLÉN leg.); N: Helsinki (TUOMIKOSKI leg.), Esbo (HELLÉN leg.); Ta: Vanaja (TIENSUU leg.); LkW: Kittilä, Muonio (FREY leg.); Li: Utsjoki (FREY leg.).

USSR: 1 ♂ (ZMH) – Kr: Paanajärvi (FREY leg.).

Description:

Male. Total body length 1.50–1.79 mm, general colour blackish brown and despite some greyish brown pruinosity rather shining. Head with blackish brown frons. Frontal triangle long and rather shining, interfrontalia and orbits somewhat silvery grey dusted and glittering, the rest of frons greyish brown pollinose and comparatively dull. Anterior margin of frons more or less yellowish brown. *pvt* in one pair and small. 4–5 small *if* of about equal length, the most anterior usually shorter and weaker. 3–5 minute *ads* inside and below *ors*. Frontal lunule, face, facial cavity and gena yellow, orange to brownish yellow. *g* of medium length, slightly longer than 2–3 setae behind it. Eye comparatively large, its diameter about 5.6 times the narrowest genal width. Antennae brownish black, 1st segment yellowish brown. Arista about 3.6 times as long as antenna and moderately ciliate.

Thorax brownish black, sparsely brownish grey pollinose, mesonotum shining, pleurae somewhat duller. 2 *hu*, the internal small, also another small anteroexternal seta on humeral callus. 2 *dc*, also the anterior long and robust. 8 rows of *ac* hairs in front of suture; the medial prescutellar *ac* pair somewhat enlarged. Scutellum triangular, comparatively long, *sc* long. Pleurae with yellowish brown sutures between sclerites. 2 *stpl*, the anterior short, both rather thin. Legs slender, dark to blackish brown, trochanters, knees and tarsi somewhat paler. t_2 chaetotaxy (Figs. 603, 604), bristles rather short, especially *av* in the middle and *va*. mt_2 comparatively slender but generally shorter than in *S. pseudosetaria*. Ratio t_2: mt_2 = 2.05 to 2.33. Wing (Fig. 591) pale brownish or greyish, veins brown. *C* not or quite indistinctly extended beyond R_{4+5}, the latter straight but distinctly divergent from the colourless fold of M_{1+2} beyond t_p. Discal cell of medium length, distally tapering, with short appendage of M_{1+2} beyond t_p; the appendage of M_{3+4} usually reduced or absent. Alula long and narrow, apically rounded. Wing measurements: length 1.39–1.75 mm, width 0.62–0.79 mm, *C*-index = 0.87–1.15, t_a–t_p: t_p = 2.18 to 3.00. Halteres with yellow to orange stem and blackish brown knob.

Abdomen blackish brown, brownish grey dusted, subshining; terga sparsely, sterna more densely and shortly haired. *T1+2* with medial basal pale pigmented area. *S5* (Fig. 592) with double posteromedial comb of spines; the anterior row composed of small to minute spines somewhat enlarged medially. Pigmentation of *S5* as in *S. luteilabris* but setae in the middle different, short and somewhat thickened (in contrast to *S. ibrida* spec. nov.) and apically curved like a fish-hook.

Genitalia. Periandrium of usual construction and chaetotaxy, thus with a long dorsolateral hair and somewhat shorter laterocaudal hair; also cerci as usual, each with a long caudal hair besides some short setae. Hypandrium of medium length. Telomere (Fig. 593) with robust and rounded anterior part, micropubescence on the whole outer side except for the anterior part, and with comparatively robust ventral spine, longer than that of *S. ibrida* spec. nov. Aedeagal complex (Fig. 594) similar to that of *S. ibrida* spec. nov., with compact and posteriorly not tapered phallophore; distiphallus with large lateral arches, in lateral view covering the medial dorsopreapical projection. Postgonite more robust than in *S. luteilabris* (especially apically) and somewhat more sinuate than that of *S. ibrida* spec. nov. Outer distal side of postgonite with about 4 minute setulae. Ejaculatory apodeme present but very small.

Female. Similar to male but differs as follows. Total body length 1.70–2.06 mm. t_2 chaetotaxy as in male, but ventrally with longer *av* below middle. Ratio t_2: mt_2 = 2.00–2.21. Wing measurements: length 1.66–1.80 mm, width 0.67–0.75 mm, *C*-index = 1.02–1.17, t_a–t_p: t_p = 2.08–3.00. Preabdomen as in male, including *T1+2* with pale pigmented mediobasal area.

Postabdomen (Figs. 598–600). *T6* simple, oblong. *T7* comparatively short and laterally extended. *T8* dorsomedially shortened but not divided, laterally extended. *T9* shortly triangular, with a pair of dorsal setulae. *S6* and *S7* simple, *S7* narrower. *S8* similar to that of *S. luteilabris*, thus somewhat protruding posteromedially and carrying 4 longer medial hair-like bristles. *S9* comparatively large, with characteristic micropubescence and some small setulae on posterior margin. Spectacles-shaped sclerite (Fig. 602) weakly sclerotized, with narrowed rings. Spermathecae (Fig. 601) tyre-shaped, with usual internal sac; spermathecal ducts with long sclerotized terminal parts conically enlarged. Cerci rather robust, each with longer apical and dorsopreapical sinuate hairs and short ventropreapical and lateral hairs.

Discussion: The species belongs to the very complicated *S. pseudosetaria*-group but differs, with *S. ibrida* spec. nov., from its other relatives by the yellow to yellowish brown lower head in both sexes, comparatively short but thin mt_2 and aedeagal complex with robust S-shaped postgonite and distiphallus with lateral flat arches covering the dorsopreapical projection in lateral view. Females of both these species have spermathecae with terminally conically dilated spermathecal ducts and weakly sclerotized spectacles-shaped sclerite. *S. rufilabris* (STENHAMMAR) and *S. ibrida* spec. nov. are very closely related but

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they can be separated by some details in the armature of male *S5* (setae in the middle, posteromedial comb), shape of telomere and postgonite. Moreover, *S. rufilabris* has more divergent R_{4+5} and venal fold of M_{1+2} beyond t_p, generally smaller *C*-index and paler face, facial cavity and gena.

The identity of *S. rufilabris* has been recognized by examination of types but it is possible that *S. ibrida* spec. nov. might be mixed with material of *S. rufilabris* recorded by various authors. However, *S. rufilabris* seems to be more common and widely distributed so that the majority of records probably really refer to this species.

Biology: The species occurs in shady wooded places, under decayed vegetation (RICHARDS, 1930); DUDA (1918) swept it in numbers over wet leaves in wood. It was mostly found by sweeping over undergrowth of woods but also on sheep excrement (LYNEBORG, 1968) and in burrows of small mammals (RICHARDS, 1930). These data agree well with my findings (mostly swept, some sifted from leaf litter and 2 specimens found on cattle excrement). The species is more common in higher altitudes in Central and South Europe (up to 2,200 m in Rila Mts.) and occurs during the whole vegetation period (RICHARDS, 1930 and material examined). The feeding substrate of the larvae is unknown but it is probably a phytosaprophagous species.

Distribution: Probably a Eurosiberian species, although some records mentioned below may refer to *S. ibrida* spec. nov. Besides Europe recorded from Nepal (DEEMING, 1969) and Mongolia (PAPP, 1973a). European records: Iceland (ANDERSSON, 1967), Faeroe Is. (LYNEBORG, 1968), GB: England, Scotland (RICHARDS, 1930, 1976; GODDARD, 1938), France (SÉGUY, 1934), Belgium (VANSCHUYTBROECK, 1942), FRG, GDR, Austria (DUDA, 1918), Czechoslovakia (RONDANI, 1880; KOWARZ, 1894; VIMMER, 1913; ROHÁČEK, 1978b); Jugoslavia (COE, 1962a), Bulgaria, Denmark (material examined, new), Norway (DUDA, 1918), Sweden (STENHAMMAR, 1854; ZETTERSTEDT, 1860), Finland (FREY, 1941; PAPP, 1973b), USSR: Estonia (HACKMAN, 1972).

Spelobia (Spelobia) ibrida spec. nov.

(Figs. 595–597, 605, 606, 610)

Type material: Holotype ♂: Czechoslovakia, Moravia, H. Jeseník Mts., Karlov, 21. 5. 1977, on decayed leaves by stream, J. ROHÁČEK leg. (SMO). Allotype ♀: Czechoslovakia, Moravia, H. Jeseník Mts., peat-bog Skřítek, 25. 10. 1977, sifting Sphagnum, J. ROHÁČEK leg. (SMO). Paratypes: 1 ♂ same data as for allotype; 2 ♂ same locality as for allotype, 4. 10. 1978, sifting Sphagnum; 1 ♀ same locality, 4. 10. 1978, on excrement of red deer; 3 ♂ same locality, 1. 11. 1978, sifting Sphagnum (all SMO); 1 ♂ Moravia, Třešť, Špičák Mt., 11. 7. 1975, on excrement of mouflon (JRO), all J. ROHÁČEK leg.; 1 ♂ Finland, Ks: Kuusamo, No. 1604; 1 ♂ same locality, No. 1617, both R. FREY leg. (ZMH).

Description:

Male. Total body length 1.59–1.87 mm, general colour brownish black, sparsely brownish grey dusted and rather shining. Head brownish black. Frons brownish black with paler brown anterior margin. Frontal triangle rather shining; interfrontalia and orbits silvery grey dusted and glittering, the rest of frons brownish grey to black dusted, dull. *pvt* small but almost crossing; 3–5 short *if* (often different number on each side), the most anterior minute as a rule; 4–5 fine *ads* inside and below *ors*. Frontal lunule, facial cavity, face and especially gena darker than in *S. rufilabris*, yellowish brown to reddish brown, gena posteriorly often dark brown. *g* of medium length; 2 additional setae behind it and peristomal hairs well developed. Eye rather large, its diameter about 4.2 times the narrowest genal width, thus somewhat smaller than in *S. rufilabris*. Antennae blackish brown to black, arista about 3.6 times as long as antenna, medium long ciliate.

Thorax brownish black, mesonotum rather shining, pleurae subshining, greyish brown dusted. 2 *hu*, the internal minute, as long as an additional anteroexternal seta on humeral callus. 2 *dc*, also the anterior comparatively long. 8 rows of *ac* hairs in front of suture; the medial prescutellar *ac* pair slightly enlarged. Scutellum triangular, relatively long, with long *sc*. 2 *stpl*, both thin, the anterior one-third the length of the posterior. Sutures between pleural sclerites pale yellowish brown. Legs dark brown, trochanters, knees and tarsi paler brown. t_2 chaetotaxy as in Figs. 605, 606, thus similar to that of *S. rufilabris*. Ratio t_2: mt_2 = 1.93–2.13. Wing (Fig. 610) pale brownish, veins yellowish brown, *C* darker brown and not extended beyond R_{4+5}. R_{4+5} straight. Discal cell of medium length but tapering distally, with short appendages of M_{1+2} and M_{3+4} beyond t_p. M_{1+2} continued by colourless fold being more parallel to R_{4+5} than in *S. rufilabris*. Alula long but narrow, apically rounded. Wing measurements: length 1.59–1.85 mm, width 0.67–0.79 mm, *C*-index = 1.07–1.38, t_a–t_p : t_p = 2.36–3.00. Halteres with yellow stem and brown knob.

Abdomen blackish brown, terga sparsely, sterna more densely and shortly haired. *T1+2* with weakly sclerotized and pale pigmented basal medial area. *S5* (Fig. 595) very similar to that of *S. rufilabris* but the anterior row of posteromedial comb composed of very minute spines or tubercles and setae in front of it thin although apically hook-like curved.

Genitalia. Periandrium, hypandrium and cerci as in *S. rufilabris*. Telomere (Fig. 596) narrower, especially its posterior part shortened. Micropubescence on outer side of telomere of similar extent as in *S. rufilabris* but the robust ventral spine distinctly shorter. Aedeagal complex (Fig. 597) also very similar to that of *S. rufilabris*; some slight differences can be found in the armature of dorsopreapical projection of distiphallus and in the shape of postgonite.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.90 to 2.02 mm, t_2 chaetotaxy as in *S. rufilabris*, thus with longer *av* below middle than in male. Ratio t_2: mt_2 = 2.07–2.21. Wing measurements: length 1.78–1.93 mm, width 0.73–0.79 mm, *C*-index = 1.12–1.26, t_a–t_p : t_p = 2.64–2.75. Preabdomen as in male.

Postabdomen as in *S. rufilabris*, including *S8*, *S9*, spectacles-shaped sclerite and cerci. Spermathecae with somewhat shorter conically dilated terminal parts of ducts.

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Discussion: The species is very similar and closely allied to *S. rufilabris* (STENHAMMAR) and differs from it in having a darker facial cavity, face and gena, usually higher *C*-index, finer setosity in the middle of male *S5*, shorter telomere with smaller ventral spine and slightly different aedeagal complex. Owing to its darker lower head the female of *S. ibrida* spec. nov. might be confused with female of *S. luteilabris* (especially small specimens from non-synanthropic populations — see below) but the spermathecae and spectacles-shaped sclerite allow its safe identification.

Biology: The majority of type specimens were collected by sifting Sphagnum on peat-bog meadow, 2 on excrement (red deer, mouflon) and one on decayed leaves by stream. Adults were caught in V, VII, X, XI.

Distribution: Hitherto only Czechoslovakia and Finland, but it might be represented under some records of *S. rufilabris* (see above).

Spelobia (Spelobia) luteilabris (RONDANI, 1880), comb. nov.

(Figs. 2, 3, 607–609, 611–620)

Limosina luteilabris RONDANI, 1880: 32; PAPP, 1973c: 61 (key)
Limosina (Scotophilella) luteilabris: DUDA, 1918: 164
Leptocera (Scotophilella) luteilabris: DUDA, 1925: 163 (key)
Leptocera (Limosina) luteilabris: RICHARDS, 1930: 304; HARRISON, 1959: 273
Limosina (Limosina) luteilabris: DUDA, 1938: 130
Leptocera luteilabris: NARTSHUK, 1970: 349 (key)
Limosina simplicimana RONDANI, 1880: 31; DAHL, 1909: 372 (key)
Leptocera simplicimana: SÉGUY, 1934: 470
Limosina pumilio: DAHL, 1909: 371 (key) nec MEIGEN, 1830

Type material:
Limosina luteilabris RONDANI: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "1944" (a catalogue No. — red numeral on oval label); Paralectotype ♂ labelled as the lectotype (MSF).
Limosina simplicimana RONDANI: Lectotype ♀ (des. by ROHÁČEK in 1979) labelled: "1941" (a catalogue No. — red numeral on oval label); paralectotypes: 1 ♂ 2 ♀ labelled as the lectotype (MSF).

Material examined (besides "Type material"): 115 ♂ 140 ♀

Azores: 1 ♂ (ZMH) — San Jorge-Ribeira do Salto (FREY leg.).

Madeira: 1 ♂ (ZMH) — Ribeiro Frio (FREY leg.).

The Netherlands: 1 ♂ (JRO) — Lunteren (EVENHUIS leg.).

Czechoslovakia: 93 ♂ 117 ♀ (JRO, JZP, NMP, MHK, PFB, VUP) — Bohemia: Doupovské hory Mts.-Doupov (ROHÁČEK leg.), Benešov, Zichovec nr. Slaný (KOVÁŘ leg.), Praha-Prokop (ZEMAN leg.), Praha-Černošice (VIMMER leg.), Praha-Libuš, Praha-Ruzyně, Zvíkov (ZUSKA leg.), Kamýk n. Vlt. (PULPÁN leg.), Police n. M., Liberec (LAŠTOVKA leg.), Malá Skála (MOCEK leg.), Černý rybník nr. Klíny (SCHÖN leg.), Zvířetice, Pardubice-Svítkov (MOCEK leg.), Hluboká (KOVÁŘ leg.), Havlíčkův Brod, Palupín nr. Strmilov (ROHÁČEK leg.); Moravia: Třešt, Řásná nr. Telč, Otín nr. Stonařov, Brno-Ledná, Brno-Soběšice, Mor. Kras-Těchov (ROHÁČEK leg.), Pohořelice (MOCEK leg.), H. Jeseník-Skřítek, Rejvíz (ROHÁČEK leg.); Slovakia: Patince nr. Komárno, V. Fatra-Suchá dolina, Turček (ROHÁČEK leg.), Humenné (VALEŠOVÁ leg.).

Austria: 1 ♂ (IZI) — Tyrol: Obergurgl Mt. (STOCKNER leg.).

Bulgaria: 1 ♂ (IZS) — Plana (BESHOVSKI leg.).

Denmark: 16 ♂ 22 ♀ (ZMK) — SJ: Nørreskov-Als (LYNEBORG leg.); WJ: Fanø (MORTENSEN leg.); NWJ: Agger (MORTENSEN leg.); SZ: Suserup (ZIMSEN leg.); NEZ: Holte (KRYGER, LUNDBECK leg.), Hillerød, København, Aalholm (LUNDBECK leg.), Bagsvaerd, Brordrup, Bognaes (LYNEBORG leg.).

Finland: 1 ♂ 1 ♀ (ZMH) — Le: Kilpisjärvi (HELLÉN leg.).

Description:
Male. Total body length 1.55–2.08 mm, general colour brown to blackish brown, brown dusted, subshining. Head with dark brown but anteriorly often paler yellowish brown frons; frontal triangle narrow, subshining; interfrontalia and orbits silvery grey dusted and somewhat glittering, the rest of frons brown dusted, dull. 2 pairs of convergent *pvt*, the anterior pair false; 3–5 *if*, the middle 2 usually more robust; 5–7 small *ads* inside and below *ors*. Frontal lunule, facial cavity, partly face and gena yellowish brown to yellow and yellowish grey dusted. *g* small, behind it 3 short setulae. Eye larger than in *S. pseudosetaria*, its diameter about 3.2 times the narrowest genal width. Antennae brownish black to black, arista about 3.8 times as long as antenna, medium long ciliate.

Thorax brown to blackish brown and rather densely brown dusted. Mesonotum despite the pruinosity shining, pleurae duller. 2 *hu*, the external very long, the internal small. 2 *dc*, also the anterior robust and long. 8 rows of *ac* hairs between anterior *dc*; the medial prescutellar *ac* pair somewhat enlarged. Scutellum long, elongate triangular, *sc* long. Pleurae with yellowish sutures between sclerites. 2 *stpl*, the anterior small. Legs brown, fore coxa, trochanters, knees and tarsi paler, femora darker. t_2 chaetotaxy (Fig. 609), bristles on dorsal side not very long. mt_2 with *av* and *pv* row of stout short spines. t_3 in large specimens distinctly, in small specimens a little curved. Ratio $t_2 : mt_2 = 2.00–2.22$. Wing (Fig. 611) very pale brownish or greyish brown, veins pale brown. *C* darker brown and not extended beyond R_{4+5}; R_{4+5} straight or indistinctly bent to *C*. Discal cell rather long and tapering distally, its outer corners with short processes of M_{1+2} and M_{3+4}, the latter may also absent and that of M_{1+2} is continued by colourless fold running nearly parallel with R_{4+5}. Alula large but narrow, apically rounded. Wing measurements: length 1.55–1.95 mm, width 0.67–0.83 mm, *C*-index = 1.14–1.38, $t_a–t_p$: $t_p = 2.30–3.40$. Halteres pale yellow with darker yellowish brown knob (darker halteres usually in small specimens).

Abdomen brown, brownish dusted, relatively shining. Terga with moderate semierect hairs, sterna more densely and shortly haired. *T1+2* with large mediobasal weakly sclerotized and paler pigmented area. *S5* (Fig. 612) medially with dark pigmented tongue-shaped spot; also its anterior margin darkly pigmented. Posteromedial comb rather long and composed of 3 rows of spines, but 2 more anterior rows consisting of very minute spines. Bristles arising on paler pigmented area of *S5* simple and thin.

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Genitalia. Periandrium similar to *S. pseudosetaria*, with a long dorsolateral hair-like bristle, but also a laterocaudal bristle rather long, almost as long as the caudal hair on cercus; otherwise shortly haired. Cerci as usual in *Spelobia* s. str., each with a long caudal hair and some small setulae. Hypandrium of medium length. Telomere (Fig. 613) robust, especially its posterior part, anterior part tapering apically (thus differing from that of related species). Micropubescence on the whole posterior half of outer side and very dense at posterior margin; setiform hairs not very long. Ventral spine short, robust, somewhat bent internally and abruptly pointed. Aedeagal complex (Fig. 614) with compact, posteriorly more tapering phallophore than in *S. rufilabris* and *S. ibrida* spec. nov. Distiphallus with characteristic dorsopreapical projection carrying a small triangular process; apex of distiphallus finely tuberculate as in *S. pseudosetaria*. Postgonite slender and pointed. Ejaculatory apodeme small.

Female. Similar to male but differs as follows. Total body length 1.59—2.30 mm, facial cavity, face and gena brown to blackish brown but gena sometimes reddish brown anteriorly. t_2 with stronger bristles (Figs. 607, 608), t_3 hardly curved. Ratio t_2: mt_2 = 2.00—2.25. Wing measurements: length 1.62—2.06 mm, width 0.65—0.95 mm, *C*-index = 1.20—1.39, $t_a - t_p : t_p$ = 2.33—3.25. Preabdomen somewhat more densely haired.

Postabdomen (Figs. 615—617) with simple *T6* and *T7*. *T8* medially paler pigmented and weakly sclerotized, dorsally very short, laterally extended. *T9* shortly triangular, with 2 rather long dorsal setae. *S6* and *S7* simple, shortly densely haired. *S8* short, with ventromedial protuberance as in related species, carrying 2 long and some shorter bristles. *S9* comparatively large, with 2 pairs of longer setulae. Spectacles-shaped sclerite (Figs. 619, 620) simple, composed of simple medial transverse sclerite and elongately oval rings. Spermathecae (Fig. 618) tyre-shaped, with protrusible internal sac; sclerotized parts of ducts unusually long and terminally only very slightly dilated. Cerci rather robust, each with a long sinuate apical and dorsopreapical hair; other setulae short.

Preimaginal stages: The puparium was described and illustrated by OKELY (1974: 52, Figs. 39, 40, 44). It is very similar to that of other species of *Spelobia* s. str., with long anterior spine-like spiracular processes, each with about 5—8 short, pale papillae. The egg is illustrated in Part I (Figs. 2, 3).

Discussion: The species is a representative of the very intricate *S. pseudosetaria*-group. Because of the comparatively high variability of the key characters previously used (the colour of halteres, *pv* spines on mt_2) it is advisable to check the identification of doubtful specimens by the examination of male genitalia or female postabdomen which prevents confusion with related species (*S. rufilabris* and *S. ibrida* spec. nov.). *S. luteilabris* is distinguished by its sexually different colouring of facial cavity (male — yellowish, female — brown to blackish brown), short mt_2, male *S5* with simple and thin setae in the middle, posteriorly robust telomere with tapered anterior part, aedeagal complex with slender postgonite, characteristic spermathecae and spectacles-shaped sclerite.

The presumed synonymy of *Limosina simplicimana* RONDANI, 1880, with *S. luteilabris* (cf. DUDA, 1938) has been confirmed by study of the type material. *Limosina simplicimana* had apparently been described from a female; therefore, a female was selected from syntypic specimens for the designation of lectotype (see "Type material").

Biology: The species is apparently polysaprophagous with wide ecological valence. It was found on various kinds of excrement (breeding records: PAPP, 1973c — from human faeces; I have seen specimens bred from rabbit and mink dung), carrion, decayed vegetation (breeding record — OKELY, 1974), in burrows of rodents including rabbits, in nests of birds, in caves, cellars etc. (RICHARDS, 1930; SÉGUY, 1934; DUDA, 1938; LYNEBORG, 1968; PAPP, 1973c etc.). It is more frequent within the human environment than in the wild and forms successful synanthropic populations in henhouses, rabbit-hutches, cellars, urinals, refuse and compost heaps and similar situations. Adults often occur on house windows. ZUSKA & LAŠTOVKA (1969) found it rather frequently in food processing buildings, especially in poultry farms, rarely in dairies and butcheries. The wild populations are less numerous — e. g. on decayed vegetation, moss and Sphagnum, in nests of small mammals, in caves. It should be noted that the specimens from wild populations are generally smaller, darker, with less curved male t_3, apparently due to less favourable ecological conditions.

Distribution: Known from numerous countries of Europe but also spread by man to New Zealand (HARRISON, 1959; RICHARDS, 1973). Besides this, there are records from Azores, Madeira (material examined, new), Iceland (ANDERSSON, 1967), Faeroe Is. (DUDA, 1918; LYNEBORG, 1968), GB: England, Scotland (RICHARDS, 1930, 1976; OKELY, 1974), France, Corsica (SÉGUY, 1934), Italy (RONDANI, 1880), Jugoslavia (DUDA, 1918; COE, 1962a, b), Bulgaria (material examined, new), Hungary (DUDA, 1918, 1928; MIHÁLYI, 1967; PAPP, 1973c), Czechoslovakia (ZUSKA & LAŠTOVKA, 1969; DOSKOČIL, 1973; ROHÁČEK, 1978b); Austria, FRG, GDR (DUDA, 1918), Belgium (VANSCHUYTBROECK, 1942, 1943a); The Netherlands (material examined, new), Poland (DUDA, 1918), Denmark, Finland (material examined, new). Because of its synanthropy it is expected to be spread to further continents in the future.

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Spelobia (Spelobia) ulla spec. nov.

(Figs. 621–626)

Type material: Holotype ♂: Finland (Finnish Lapland), Lk: Pallasjärvi (lake), No. 213 (30. 6. 1953), A. WEGELIUS leg. (ZMH).

Description:

Male. Total body length 1.91 mm, general colour blackish brown. Head brown. Frons dark brown posteriorly, paler anteriorly. Frontal triangle shining, interfrontalia and orbits silvery pollinose; narrow stripes between orbits, interfrontalia and frontal triangle blackish brown dusted. *pvt* small but distinct; only 3 *if* (in contrast to *S. pseudosetaria*), the middle somewhat longer than remaining; 4 minute *ads* inside and below *ors*. Frontal lunule and face pale brown and dusted, gena darker brown and dusted. Facial cavity dark brown, sparsely pollinose and shining. *g* of medium length. Eye normal, its diameter about 3.8 times the smallest genal width. Antennae brown, 3rd segment shortly ciliate. Arista 3.4 times as long as antenna, medium long pubescent.

Thorax blackish brown, brown pollinose, subshining. Pleurae more densely pollinose, dull, with yellowish brown sutures between sclerites. 2 *hu*, the internal small. 2 *dc*, the anterior shorter. 8 rows of *ac* hairs between anterior *dc*, the medial prescutellar *ac* pair only slightly enlarged. 2 *stpl*, the anterior small. Scutellum long, roundly triangular, with long *sc*. Legs with yellowish brown trochanters and knees, otherwise brown. t_1 simple, slender. t_2 chaetotaxy as in Fig. 622, 623, mt_2 long and slender. Ratio t_2: $mt_2 = 1.76$. Wing (Fig. 621) pale brownish, veins brown, *C* the darkest and not extended beyond R_{4+5}. R_{4+5} almost straight, only apically indistinctly bent up to *C*. Discal cell of medium length, the appendages of M_{1+2} and M_{3+4} very short though not wholly absent. Alula narrow, apically rounded. Wing measurements: length 1.71 mm, width 0.71 mm, *C*-index = 1.14, $t_a - t_p$: $t_p = 2.73$. Halteres yellowish brown, stem yellow.

Abdomen brown, sparsely haired, subshining. *T1+2* with large, pale pigmented mediobasal area. *S5* (Fig. 624) very characteristically bristled and pigmented. The medial posterior comb of spines composed of 3 rows of rather long spines (in contrast to all related species) and in front of them there are 2 groups of short, thick and apically hook-like curved bristles. Lateral parts of *S5* simply and sparsely setose.

Genitalia. Periandrium with a long dorsolateral hair, relatively long hairs round the anal fissure and otherwise sparsely and shortly haired. Cerci each with single longer caudal hair; hypandrium of medium length. Telomere (Fig. 625) short, with comparatively slender anterior part. Micropubescence long and densely covering almost all outer surface of telomere; ventral spine robust but not very long. Aedeagal complex (Fig. 626) with distiphallus somewhat similar to that of *S. baezi* (cf. dorsopreapical projection); phallophore as in related species. Postgonite distinctly shorter and more robust than that of *S. pseudosetaria*. Ejaculatory apodeme not observed.

Female unknown.

Discussion: The species superficially resembles *S. pseudosetaria* (DUDA) (dark facial cavity, long and slender mt_2) but has somewhat paler halteres, only 3 *if* and only 1 proximal *ad* on t_2 and distinctive genitalia (telomere with narrower anterior part, male *S5* with threefold posteromedial comb and 2 groups of short thick bristles in front of it, different postgonite and distiphallus). By its internal genitalia and telomere it seems to be somewhat more related to *S. luteilabris*; perhaps some of species described by PAPP (1973a, 1974d) from Mongolia and associated with *S. pseudosetaria* (originally with *Limosina penetralis*)-group might have been closely allied to it but a more detailed knowledge of their male and female terminalia are needed for the correct appreciation of their relationships.

Biology: Unknown.

Distribution: Finland (Finnish Lapland).

Spelobia (Spelobia) nana (RONDANI, 1880), comb. nov.

(Figs. 627, 628, 632–643)

Limosina nana RONDANI, 1880: 24; PAPP, 1973c: 45 (key)
Limosina (Scotophilella) nana: DUDA, 1918: 152
Leptocera (Scotophilella) nana: DUDA, 1925: 161 (key)
Leptocera (Limosina) nana: RICHARDS, 1930: 303
Leptocera nana: SÉGUY, 1934: 468; NARTSHUK, 1970: 348 (key)
Limosina (Limosina) nana: DUDA, 1938: 134
Limosina pusio: DAHL, 1909: 371 nec ZETTERSTEDT, 1847

Type material: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "1928" (a catalogue No. – red numeral on oval label); abdomen detached and preserved in small plastic tube with glycerine pinned below specimen; paralectotypes 2 ♀ labelled as the lectotype (MSF).

Material examined (besides "Type material"): 18 ♂ 18 ♀

FRG: 2 ♂ 2 ♀ (ZMB) – Westfalen: Herten (DUDA leg.).

Czechoslovakia: 8 ♂ 5 ♀ (JRO, JZP, MMB, SMO, MHK) – Bohemia: Čejkov nr. Pelhřimov (ZUSKA leg.), Rečkov-Klokočka, Choltice (MOCEK leg.); Moravia: Třešť, H. Jeseník Mts.-Skřítek, Keprník Mt., Slov. Beskydy Mts.-Girová (ROHÁČEK leg.), Brno-Kr. Pole (CZIŽEK leg.); Slovakia: Tatranská Kotlina (ROHÁČEK leg.).

Poland: 5 ♂ 5 ♀ (ZMB) – Wustung b. Habelschwerdt (DUDA leg.).

Denmark: 3 ♀ (ZMK) – F: Svanninge (KIRSTENSEN leg.); SZ: Suserup (MORTENSEN leg.); NEZ: Ermelund (LUNDBECK leg.).

Sweden: 1 ♀ (ZIL) – Tärna (ZETTERSTEDT leg.).

Finland: 3 ♂ 2 ♀ (ZMH) – Ab: Nagu (FREY leg.); N: Helsingin ymp. (TIENSUU leg.), Hoplax (FREY leg.); Le: Kilpisjärvi (HELLÉN leg.).

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Description:

Male. Total body length 1.35–1.82 mm, general colour brownish black, greyish brown dusted, subshining. Head black to brownish black. Frons with narrow anterior margin paler brown or reddish brown. Frontal triangle narrow, long and shining. Orbits, interfrontalia, ocellar triangle and occiput silvery grey dusted, the rest of frons greyish brown dusted and dull. *pvt* well developed. In front of *pvt* an additional false pair of *pvt*. 3 *if*, the middle the strongest; 5–8 small *ads* inside and below *ors*. Frontal lunule basally and often also partly face paler brown to reddish. Facial cavity and gena brownish black, greyish brown pollinose but facial cavity rather shining. *g* well developed, behind it 2 additional short setulae. Eye normal, its largest diameter about 3.8 times the smallest genal width. Antennae black, 3rd segment and arista comparatively shortly ciliate. Arista about 3.3 times as long as antenna.

Thorax blackish brown, greyish brown pruinose. Mesonotum despite the pruinosity rather shiny. 2 *hu* and 1 small anteroexternal microseta on humeral callus. 2 *dc*, the posterior long. 6–8 rows of *ac* hairs in front of suture, the medial prescutellar *ac* pair distinctly enlarged. Scutellum large, roundly triangular, *sc* long. Pleurae with pale brown sutures between sclerites, heavily greyish brown dusted and dull. 2 *stpl*, the posterior very long. Legs blackish brown, trochanters, knees and tarsi paler brown. t_1 slender and simple. t_2 with characteristic chaetotaxy (Figs. 627, 628) especially the presence of *pd* on lower half of t_2. Ratio t_2: $mt_2 = 1.76–1.94$. Wing (Fig. 632) broad, with brownish fumose membrane, veins brown. *C* not extended beyond R_{4+5}. R_{4+5} rather variable, from slightly but distinctly sinuate to almost straight (rarely). Discal cell short, both its outer corners obtuse-angled. Venal processes of M_{1+2} and M_{3+4} beyond t_p usually short but distinct. Alula narrow but apically rounded. Wing measurements: length 1.31–1.62 mm, width 0.60–0.75 mm, *C*-index = 0.74–0.95, t_a–t_p: t_p = 1.08–1.41. Halteres with orange yellow stem and brown knob.

Abdomen greyish brown pollinose, subshining. Terga sparsely haired, only laterally longer haired. Sterna more densely but shortly setulose. *T1+2* with large basal medial weakly sclerotized and pale pigmented area. *S5* (Fig. 637) in contrast with all congeners with posterior medial heavily sclerotized lamella, which probably evolved by coalescence of the usual posterior comb. Laterally, in front of the posterior lamella, there are 2 short rows of erect bristles, otherwise simply haired.

Genitalia: Periandrium (Figs. 635, 636) with a long dorsolateral hair-like bristle and shorter laterocaudal hair. Also cercus with a longer hair besides 1 short setula. Hypandrium comparatively long. Telomere (Fig. 634) with robust anterior part, thick ventral spine of medium length and micropubescence on posterior part. The minute excrescences (spines or tubercles) on upper and anterior part also rather characteristic. Aedeagal complex (Fig. 633) with compact and distinctly posteroventrally projecting phallophore; distiphallus generally similar to that of related species and its dorsopreapical projection relatively simple; postgonite slender, long, slightly S-shaped, with 3 minute anterior setulae and somewhat shortly hook-like apex. Ejaculatory apodeme small, very slender, curved.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.43 to 1.94 mm. t_2 chaetotaxy as in male but *va* more robust. Ratio t_2: $mt_2 = 1.75–1.90$. Wing generally narrower. Wing measurements: length 1.39–1.75 mm, width 0.67–0.85 mm, *C*-index = 0.68–1.05, t_a–t_p: t_p = 1.08–1.61.

Postabdomen (Figs. 638–640) short and wide. *T7* laterally extended. *T8* dorsomedially very shortened, with a narrow, medial, desclerotized and pale pigmented area. *T9* short, roughly triangular, with 2 dorsal setae. *S8* transverse, trapezoidal, with pale pigmented medial posterior area and 2 long hair-like bristles. In front of *S9* there is a small medial additional sclerite. *S9* short, with anterior medial incision. Spectacles-shaped sclerite (Figs. 642, 643) of complex form but weakly sclerotized and pale pigmented. Spermathecae (Fig. 641) large, tyre-shaped, each with a basal groove, conically widened terminal part of duct and protrusible internal sac. Cerci short, robust, each with a longer and slightly sinuate apical hair and shorter dorsopreapical, ventropreapical and lateral hairs.

Discussion: *S. nana* (RONDANI) is an aberrant species of *Spelobia* s. str. and is easily identifiable by *pd* below middle of t_2, comparatively short and broad wing (Fig. 632) usually with slightly sinuate R_{4+5}, a short discal cell, male *S5* with posteromedial cuticular ledge, aedeagal complex with slender postgonites and posteriorly projecting phallophore, female with minute additional sclerite in front of *S9* etc.

There is no apparent close relative among its Palaearctic congeners, although it undoubtedly belongs to the subgenus *Spelobia* s. str. The type material of *S. nana* has been revised and DUDA's (1918, 1938) interpretation of it confirmed.

Biology: A generally rare and little known species, although DUDA (1938) refered about its occurrence in number in peat-bog meadow and in wet forest. It has been usually swept from vegetation but RICHARDS (1930) collected it mainly under heather and at the roots of grass, DEEMING & KNUTSON (1966) bred it from a dead snail (*Helix* spec.), HACKMAN (1963a, 1967a) reared it from nests of small mammals and PAPP (1973c) examined one specimen taken on human faeces. I have collected *S. nana* mainly by sweeping on peat-bog meadows, 2 specimens also in soil traps, 1 ♂ on sheep dung, 1 ♂ sifted from moss and grass. Judging from these data, *S. nana* appears to be rather polysaprophagous meadow species. Adults were recorded from II–XII (combined data of above authors and material examined).

Distribution: Known only from Europe. GB: England (RICHARDS, 1930, 1976), Scotland (DEEMING & KNUTSON, 1966), France (SÉGUY, 1934), FRG, GDR (DUDA, 1918), Poland (material examined, new), Czechoslovakia (CZIŽEK, 1908; BRANCSIK, 1910; DUDA, 1918; DOSKOČIL & HŮRKA, 1962; DOSKOČIL, 1973; ROHÁČEK, 1978b, 1980), Austria (DUDA, 1918); Hungary (DUDA, 1918; PAPP, 1973c), Italy (RONDANI, 1880), Denmark, Sweden (material examined, new), Finland (FREY, 1941; HACKMAN, 1963a, 1967a), USSR: Estonia (HACKMAN, 1972; PAPP, 1979a).

Spelobia (Spelobia) parapusio (DAHL, 1909), **comb. nov.**

(Figs. 4, 16–18, 25, 629–631, 644–654)

Limosina parapusio DAHL, 1909: 371 (key); PAPP, 1973c: 60 (key)
Limosina (Scotophilella) parapusio: DUDA, 1918: 160

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Leptocera (*Scotophilella*) *parapusio*: DUDA, 1925: 163 (key)
Leptocera (*Limosina*) *parapusio*: RICHARDS, 1930: 303
Leptocera parapusio: SÉGUY, 1934: 468; NARTSHUK, 1970: 349 (key)
Limosina (*Limosina*) *parapusio*: DUDA, 1938: 136
Limosina (*Leptocera*) *rustica* VILLENEUVE, 1918a: 335

Type material:
Limosina parapusio DAHL: Holotype ♀ labelled: "Zool. Mus. Berlin, F.: Plagesee, 17. 4. 08, Lockeres Torfmoss, S.: DAHL 1659 III., J. N., E. K. N." Specimen is in bad condition, very faded (preserved in alcohol); its right wing, fore and hind, both mid legs and postabdomen mounted on a slide labelled: "*Limosina parapusio* F. DAHL" and "DAHL 1659 III", (ZMB, examined).
Limosina (*Leptocera*) *rustica* VILLENEUVE: Described from specimens (? females only) originating from Royan and Rambouillet (France) and from Rovereto (Italy). The type material has not been traced and is probably lost (not examined).

Material examined (besides "Type material"): 2 ♂ 259 ♀

Spain: 1 ♀ (JRO) — Güejar Sierra nr. Granada (ROHÁČEK leg.).

Belgium: 1 ♂ 1 ♀ (IRB) — Forêt de Soignes-Boitstort (COLLART leg.).

Czechoslovakia: 192 ♀ (JRO, JZP, MHK, NMP, RMM, SMO, PFB) — Bohemia: Dobřichovice (ZUSKA leg.), Hluboká (KOVÁŘ leg.), Palupín nr. Strmilov, Slavonice (ROHÁČEK leg.), Choltice, Opočno, Prachovské skály, Pardubice-Svítkov (MOCEK leg.); Moravia: Třešť, Řásná nr. Telč, Brno-Ledná, Brno-Soběšice, Brno-Líšeň (ROHÁČEK leg.), Lednice (OBRTEL, VAŇHARA leg.), Milovice nr. Mikulov, (POKORNÝ leg.), Vršovice nr. Opava, Hněvošice, H. Jeseník-Skřítek, Rejvíz, Vsetínské vrchy Mts.-Káb Mt. (ROHÁČEK leg.) and localities given by ROHÁČEK (1980); Slovakia: Turček, N. Tatry Mts.-Pustá pole, Vihorlat Mts.-Stakčín, R. Hámre (ROHÁČEK leg.), Blatná Polianka (BENEŠ leg.).

Austria: 1 ♀ (DEI) — Süd. Steiermark (STROBL leg.) — det. VILLENEUVE: "*rustica* COLLIN i. litt.".

Hungary: 2 ♀ (JRO) — Visegrád (PAPP leg.).

Bulgaria: 1 ♂ 2 ♀ (IZS) — Camp. Perla, Petric-hut Belasiza, Plana (BESHOVSKI leg.).

Denmark: 60 ♀ (ZMK) — SJ: Sønderborg (WÜSTNEI leg.); EJ: Hald (HANSEN leg.); LFM: Guldborg Storskov (ANDERSEN leg.); NEZ: Hareskov (BUCH, LYNEBORG, OVERGAARD leg.), Ermelund (LUNDBECK leg.).

Description:
Male. Total body length 1.67—1.81 mm, general colour brown to blackish brown. Head blackish brown. Frons brownish black, with paler brown anterior margin; frontal triangle black and shining; narrow stripes between orbits, interfrontalia and frontal triangle blackish dusted and dull; orbits and interfrontalia silvery grey pollinose and rather glittering. *pvt* minute, hair-like, *occi* and *occe* robust. 3 *if*, the anterior and posterior small, the middle pair very long and crossing in apical fourth its length; 5—7 minute *ads* inside and below *ors*. Frontal lunule brown, greyish pollinose; face brown, gena brownish black, greyish brown dusted. Facial cavity blackish brown, shining. *g* of medium length, thin. Eye of normal size, its diameter about 3.2 times the narrowest genal width. Antennae black to dark brown, 3rd segment comparatively long ciliate. Arista about 3.7 times as long as antenna.

Thorax blackish brown, greyish brown pollinose, mesonotum rather shining. 2 *hu* but the internal reduced to a microseta. 2 *dc* (postsutural), both comparatively robust and long. 8—10 rows of *ac* hairs between anterior *dc*. Scutellum large, long, elongate trapezoid, *sc* long. Pleurae with yellowish brown sutures between sclerites. 2 *stpl*, the anterior very minute and hair-like. Legs brown, femora the darkest, trochanters, knees and tarsi the palest, yellowish brown. t_2 with characteristic chaetotaxy (Figs. 629, 631), *av* below middle comparatively short. Ratio $t_2 : mt_2 = 1.97—2.00$. Wing (Fig. 644) with pale brownish membrane; veins brown, *C* darker and reaching only to R_{4+5}. R_{4+5} straight. Discal cell of medium length, with short appendages of M_{1+2} and M_{3+4} beyond t_p, the first mentioned being continued by colourless fold. Alula narrow, apically rounded. Wing measurements: length 1.81—1.90 mm, width 0.77—0.83 mm, *C*-index = 0.93—1.01, $t_a—t_p : t_p$ = 2.66 to 2.73. Halteres pale whitish yellow, knob usually darker yellow.

Abdomen dark brown, greyish brown pollinose but rather shining. Terga sparsely and finely but relatively long haired, sterna shortly and more densely setulose. *T1+2* simply pigmented. *S5* (Fig. 648) with pigmentation as figured; medial posterior comb consisting of 3 rows of short, thick spines, 2 being situated posteriorly and 1 more anteriorly; between them a pale pigmented area with some solitary spines. In the middle of *S5* there are 2 groups of thick bristles.

Genitalia. Periandrium (Fig. 646) sparsely haired, with a long dorsolateral, somewhat sinuate hair-like bristle and a shorter laterocaudal bristle. Cerci distinct, each with a longer bristle and some short setae. Hypandrium comparatively short. Telomere (Fig. 647) distinctive, with large, rounded anterior part, comparatively small posterior part with very long and robust ventral spine and with characteristic pattern of micropubescence on outer side (2 spots). Aedeagal complex (Fig. 645) with comparatively long phallophore; distiphallus with a number of small processes and teeth dorsally apart from the medial dorsopreapical projection. Postgonite roughly S-shaped, posteroexternally with about 3 minute setulae in the apical third. Ejaculatory apodeme not observed.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.58—2.22 mm. Middle pair of *if* yet longer than in male and crossing in the apical third of their length. t_2 with longer *av* below middle. (Fig. 630). Ratio $t_2 : mt_2 = 1.85—2.00$. Wing measurements: length 1.51—2.18 mm, width 0.65—0.91 mm, *C*-index = 0.93 to 1.11, $t_a—t_p : t_p = 2.09—2.77$. Abdomen with large membraneous pleural part (for dilatation when gravid).

Postabdomen (Figs. 649—651). *T6* simple, *T7* extended laterally. *T8* divided into 2 lateral parts. *T9* comparatively elongate, rhomboid, anteromedially with a pale pigmented spot, dorsally with 3 minute setulae on each side. *S6* and *S7* simple, the latter more sparsely haired. *S8* smaller, roundly trapezoidal, medially darkly pigmented and carrying 2 longer ventral bristles. *S9* comparatively large, with a pair of long but thin ventral hair-like bristles. Spectacles-shaped sclerite (Figs. 653, 654) with weakly sclerotized medial part but rather robust and expressive circles. Spermathecae (Fig. 652) characteristic, cylindrical but shorter than those of *S. cambrica*, with impressed terminal tips. Sclerotized parts of spermathecal ducts terminally dilated. Cerci each with longer sinuate apical and dorsopreapical hair; ventropreapical hair shorter and slightly curved.

Preimaginal stages: The egg is figured (Fig. 4) here; it is characterized by simple pitted chorion and 2 laterodorsal lengthways situated band-like ledges. Larva is unknown but the puparium was described and illustrated by OKELY (1974: 52, Figs. 35, 36, 42). It resembles that of other *Spelobia* species, having the elongate spine-like anterior spiracular processes (see Figs. 16—18, 25).

Discussion: *S. parapusio* (DAHL) differs distinctly from all its congeners by the combination of outer characters (long middle *if*, t_2 with a pair of proximal bristles — *ad* and *pd*, narrow alula, simply pigmented *T1+2*) and the configuration of the male and female terminalia. Only *S. pappi* spec. nov. has similar t_2 and head chaetotaxy but it is easily separable from *S. parapusio* by yellow lower head and apically slightly curved R_{4+5}.

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The males of *S. parapusio* are extremely rare but even the female is easily recognizable by the above characters and especially by its cylindrical spermathecae, very shortly setulose *T9* and distinctively pigmented *S8*.

The identity of *S. parapusio* was confirmed by examination of the female holotype, but the syntypic material of *Limosina rustica* VILLENEUVE, 1918, has not been discovered. Despite this, *Limosina rustica* VILLENEUVE is considered to be synonymous with *S. parapusio*, in concordance with RICHARDS (1930) and DUDA (1938). Moreover, I have examined a female of *S. parapusio* determined by J. VILLENEUVE as "*rustica* COLLIN i. litt.". This species had been originally discovered by J. E. COLLIN who gave it a manuscript name "*Limosina rustica*" without publishing its description. J. VILLENEUVE, who had probably known the species from COLLIN, applied this name to his material (and also to some other specimens) and later (VILLENEUVE, 1918a) described the species from them using original COLLIN's name *Limosina rustica*.

Biology: The species is fairly interesting biologically not only for its obligatory fungivority but especially for the parthenogenesis which is the predominant type of reproduction in the majority of populations. The species is confined to woodland regions and develops in various fungi (RICHARDS, 1930; DUDA, 1938; PAPP, 1972, 1973c, 1979b; HACKMAN & MEINANDER, 1979). It was recorded during the whole year (RICHARDS, 1930) but is common mainly in autumn when fungi are most abundant. It was found also in burrows of small mammals (rabbits, moles) but probably only by chance, although the larvae might develop also in mycelia of primitive fungi there.

The parthenogenesis in *S. parapusio* was first presumed by PAPP (1972) but RICHARDS (1930) noted the striking prevalence of females of this species. OKELY (1974) demonstrated the parthenogenetic reproduction of *S. parapusio* by breeding. She had observed that the majority of eggs laid by virgin females were not viable but some continued development and were truly parthenogenetic. Each virgin female laid 40—100 eggs during a five-day period. The larval development lasted 4 days under laboratory conditions. Larvae burrowed into fungus but pupated on the surface of decaying fungus or out of it. For further details see Part I, p. 212, in the chapter "Biology (general)".

The males are extremely rare (recorded by DUDA, 1918, 1938; RICHARDS, 1930; COE, 1962a). The more numerous finds (VANSCHUYTBROECK, 1943a — some material examined) are surely misidentified. I have seen only 2 ♂ besides a great deal of females.

Distribution: Besides Europe reported only from Tunisia and Madeira (DUDA, 1918). European records: Spain (material examined, new), Corsica (DUDA, 1918), France (VILLENEUVE, 1918a; SÉGUY, 1934), GB: England, Scotland (RICHARDS, 1930, 1976; OKELY, 1974), Belgium (VANSCHUYTBROECK, 1942, 1943a), FRG (DUDA, 1918), GDR (DAHL, 1909; DUDA, 1918), Poland (DUDA, 1918), Czechoslovakia (ROHÁČEK, 1975a, 1978b, 1980), Austria (DUDA, 1918), Hungary (DUDA, 1918; MIHÁLYI, 1967; PAPP, 1972, 1973c, 1976a), Italy (VILLENEUVE, 1918a), Jugoslavia (DUDA, 1918; COE, 1962a, b), Bulgaria (material examined, new), Denmark (material examined, new), Sweden (HACKMAN, 1967a), Finland (FREY, 1941; PAPP, 1973b), USSR: Karelia (PAPP, 1979b), Kazan env. (PAPP, 1979a).

Spelobia (Spelobia) belanica spec. nov.

(Figs. 655—663)

Type material: Holotype ♂: Czechoslovakia, Slovakia, Belanské Tatry Mts., Tatranská Kotlina, Šarpanec, 3. 7. 1978, in runs of *Microtus arvalis*, J. ROHÁČEK leg. (JRO). Genitalia dissected and preserved in a plastic tube in glycerine pinned below specimen. Allotype ♀: Denmark, NEZ: Fedtmosen, Bagsvaerd, 30. 3. 1957, No. 444, L. LYNEBORG leg. (specimen without abdomen) (ZMK).

Description:

Male. Total body length 1.51mm, general colour blackish brown, very sparsely pruinose, shining. Head shining, sparsely pollinose, with occiput, posterior part of frons, frontal triangle, interfrontalia and posterior part of orbits brown. Anterior part of frons, frontal lunule, face, facial cavity and gena bright yellow. *pvt* very minute; 3 *if*, the anterior and posterior very small, the middle long, robust, crossing. 4—5 small *ads* inside and below *ors*. *g* small, about twice as long as peristomal hairs, behind it an additional small setula. Eye of normal size, its diameter about 3.4 times the narrowest genal width. Antennae brownish black, 3rd antennal segment longer ciliate than arista. Arista about 3.5 times as long as antenna, with short ciliation.

Thorax brownish black, mesonotum very shining; pleurae brown, more dusted and duller. Sutures between pleural sclerites yellowish brown. 2 *hu*, the internal minute. 2 *dc*, both relatively long. 8 rows of *ac* hairs between anterior *dc*; the medial prescutellar *ac* pair distinctly enlarged. Scutellum roundly triangular, rather long, with long *sc*. 2 *stpl*, the anterior very small. Legs with yellow trochanters and knees, yellowish to reddish brown femora and tarsi and blackish brown tibiae and distal tarsal segments. t_1 simple and slender. t_2 chaetotaxy as in Figs. 655. 656, *va* relatively short. mt_2 long and

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slender. Ratio $t_2 : mt_2 = 1.89$. Wing (Fig. 658) with brownish membrane, veins brown. *C* indistinctly overpassing R_{4+5}. R_{4+5} slightly sinuate, thus not straight as in related species. Discal cell relatively short and broad, with short pigmented appendages of M_{1+2} and M_{3+4}. Alula narrow, apically rounded. Wing measurements: length 1.33 mm, width 0.54 mm, *C*-index = 0.86, $t_a - t_p : t_p = 2.50$. Halteres yellow.

Abdomen brown, very sparsely haired and highly shining. *T1+2* simply pigmented. *S5* (Fig. 663) very characteristic; sparsely and finely haired, posteromedially with 5 combs of minute blunt spines arranged on a semicircular area.

Genitalia. Periandrium (Figs. 661, 662) rather sparsely haired but with the usual dorsolateral long hair. Cerci comparatively small, each carrying a long sinuate caudal hair and some small setulae. Hypandrium of medium length. Telomere (Fig. 660) comparatively long and narrow, with robust anterior part and somewhat ventrally projecting posterior part carrying comparatively small ventral spine. Micropubescence developed only at dorsal margin and macrosetae rather scanty. Aedeagal complex (Fig. 659) with simple compact phallophore (somewhat tapering but not projecting posteroventrally) and relatively slender distiphallus with slender, partly covered dorsopreapical projection and with 3 small teeth on apex. Postgonite generally similar to that of other species but different in detail, with about 2 minute setulae on anterior margin. Ejaculatory apodeme present but very small.

Female. Total body length ? mm, head, thorax, legs, wing as in the male unless mentioned otherwise. t_2 chaetotaxy (Fig. 657) with all bristles somewhat longer (especially *va*). Ratio $t_2 : mt_2 = 1.82$. Wing measurements: length 1.84 mm, width 0.83 mm, *C*-index = 1.07, $t_a - t_p : t_p = 2.14$. Abdomen of the allotype missing, therefore it cannot be described.

Discussion: The species is well distinguishable by its very shining mesonotum and abdomen, bright yellow anterior part of frons, lunule, facial cavity and gena, long middle pair of *if*, t_2 without any proximal *pd*, slightly sinuate R_{4+5} and narrow alula apart from the highly characteristic male terminalia (*S5*, telomere, distiphallus). The superficial resemblance of *S. belanica* spec. nov. and *S. pappi* spec. nov. has been noted in the discussion under the latter species. The strikingly shining body, t_2 chaetotaxy and male genitalia distinguish *S. belanica* spec. nov. satisfactorily.

The description of *Limosina diadema* STENHAMMAR, 1854, partly corresponds with the above species but *Limosina diadema* is according to STENHAMMAR (1854: 394) much larger (twice as long as *S. rufilabris*) and its frontal (? ocellar) triangle ("macula triangularis utrimque ad oculus in apice verticis") is yellowish brown which is not the case in the above species. Type material of *Limosina diadema* STENHAMMAR is apparently lost (KIM, 1972) and therefore I am obliged to consider it as species dubia as also DUDA (1938) has done.

Biology: Unknown. The holotype was caught in a run of *Microtus arvalis* on a peat-bog meadow, about 750 m a. s. l. Occurrence data are from III and VII.

Distribution: Czechoslovakia (Slovakia), Denmark.

Spelobia (Spelobia) pappi spec. nov.

(Figs. 664–677)

Type material: Holotype ♂: Czechoslovakia, Moravia, Řásná nr Telč, 8. 9. 1978, sifting Sphagnum, J. ROHÁČEK leg. (JRO). Allotype ♀ and 2 ♂ 3 ♀ paratypes with same data as for holotype (1 ♂ 1 ♀ in TMB, others JRO). Other paratypes: 1 ♀ Moravia, Třešť env., 28. 4. 1973 (JRO); 1 ♂ 1 ♀ Moravia, H. Jeseník Mts., peat-bog Skřítek, 21. 5. 1977, sifting decayed grass in runs] of *Microtus agrestis*; 1 ♂ same locality, 27. 4. 1978, sweeping over peat-bog meadow; 1 ♀ same locality, 27. 7. 1978, on excrement of *Arvicola terrestris*; 1♂ Moravia, H. Jeseník Mts., peat-bog Rejvíz, 18. 7. 1979, sweeping over peat-bog meadow, 1 ♂ same data but collected 24. 5. 1980, all J. ROHÁČEK leg. (SMO); 1 ♂ GDR, Plagefenn, 9. 6. 1908, locker Torfmoos, F. DAHL leg. (DAHL 1592 I – in alcohol) + slide with wing, fore, mid and hind leg and male postabdomen, labelled: „*Limosina coxata*" and "DAHL 1592 I" (ZMB).

Description:

Male. Total body length 1.55–1.79 mm, general colour dark, brownish black. Head with brown posterior part of frons; its anterior part yellowish brown. Frontal triangle shining, interfrontalia and orbits greyish brown pollinose. Frontal leule, facial cavity and gena yellow. *pvt* small but distinct. 3 *if*, the anterior and posterior minute, the middle pair very robust and crossing (Fig. 664). 2–3 very minute *ads* as a rule. Gena with rather small *g*. Eye normal, its diameter about 4 times the smallest genal width. Antennae black, 3rd segment somewhat longer pubescent than the shortly ciliate arista. Arista about 3.0 times as long as antenna.

Thorax brownish black, brown pollinose. Mesonotum subshining, pleurae more heavily dusted and dull. Sutures between pleural sclerites brownish yellow. Mesonotal chaetotaxy as usual – 2 *dc*, the anterior relatively long; *ac* hairs in 6–8 rows between anterior *dc*. Scutellum roundly triangular and relatively long. 2 *stpl*, the anterior very minute. Legs with yellow coxae, trochanters, femoral bases and knees; femora yellowish brown to brown, tibiae blackish brown (especially apically), tarsi pale brown. t_2 chaetotaxy as in Figs. 665, 666, the most characteristic is the long proximal *pd*. Ratio $t_2 : mt_2 = 1.93–2.12$. Wing (Fig. 667) with brownish yellow membrane, veins brown. *C* not extended beyond R_{4+5} which is apically very slightly but distinctly bent up to *C*. Discal cell relatively short; pigmented appendages of M_{1+2} and M_{3+4} beyond t_p very short or absent. Alula narrow, apically rounded. Wing measurements: length 1.39–1.55 mm, width 0.60–0.67 mm, *C*-index = 0.76–0.90, $t_a - t_p : t_p = 1.67–1.83$. Halteres with yellow stem, knob rather brownish.

Abdomen dark, almost black, terga despite greyish brown pruinosity shining and very sparsely haired. Sternal part more pruinose and more densely haired. *T1+2* simple, without any paler pigmented area. *S5* (Fig. 672) very large and distinctively armed, medially with a posterior comb-like structure composed of 4–5 rows of short and 1 row (the most posterior) of longer spines; round and in front of this structure there is a group of long and very stout spine-like bristles.

Genitalia. Periandrium (Figs. 670, 671) with a long dorsolateral hair; also caudal hair on cercus rather long. Otherwise sparsely haired. Cerci and intraperiandrial structure of usual form. Telomere (Fig. 669) characterized by 2 robust spines in addition to the usual (here the most posteriorly situated) ventral spine. Aedeagal complex (Fig. 668) similar to that of other species of the subgenus but phallophore rather protruding ventrally. Distiphallus well sclerotized, postgonite S-shaped, not very pointed apically and bearing some minute setulae on anterior margin. Ejaculatory apodeme not found.

Female. Similar to male but differs as follows. Total body length 1.35–1.87 mm. Legs usually more darkened and all bristles on t_2 somewhat longer. Ratio $t_2 : mt_2 = 2.00–2.23$. Wing measurements: length 1.31–1.63 mm, width 0.54–0.75 mm, *C*-index = 0.80–1.03, $t_a - t_p : t_p = 1.80–2.18$.

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Postabdomen (Figs. 673–675) not considerably narrower than preabdomen, short. *T8* divided into 2 lateral sclerites. *T9* very small and carrying a pair of minute dorsal hairs. *S8* very large, more sclerotized and pigmented anteriorly; its large posterior area pale pigmented, finely pubescent and carrying 2 long ventral bristles. *S9* short, transverse. Spectacles-shaped sclerite (Fig. 677) rather membraneous except for its rings being more sclerotized. Spermathecae (Fig. 676) very large compared to the size of postabdomen, especially the solitary one. All spermathecae tyre-shaped, with conical terminal parts of ducts, furrowed surface of bodies and protrusible internal sac. Cerci very small, short, each with some short hairs of which only the apical one is longer and sinuate.

Discussion: The species is very distinctive representative of the subgenus *Spelobia* s. str. and is easily recognizable even by the combination of external features (yellow facial cavity, lunule, face and gena, very long middle pair of *if*, t_2 with proximal *pd*, narrow alula, slightly bent R_{4+5}). *S. belanica* spec. nov. has similar colouring of head and long middle *if* but cannot be mistaken for it because of different t_2 chaetotaxy. *S. parapusio* (DAHL) has similar t_2 chaetotaxy and long middle *if* but dark blackish brown head. The genitalia and female postabdomen of both above discussed species are also quite different. Superficially, *S. pappi* spec. nov. strikingly resembles *Leptocera* (*Pteremis*) *fenestralis* (FALLÉN) almost imitating this species (but differs from it by the absence of ventropreapical bristle on t_2) and it may be easily confused with it because both these species often occur together in Sphagnum on peat-bog meadows.

The actual relationship of *S. pappi* spec. nov. is not quite clear; it does not seem to have any clear relative; some affinity to *S. belanica* spec. nov., *S. nana* and *S. parapusio* is only indicated.

Biology: This interesting species seems to be strictly associated with peat-bogs and peat-bog meadows. I have captured it by sifting Sphagnum and decayed grass or by sweeping on peat-bog meadows, only 1 ♂ on excrement of *Arvicola terrestris* in the same biotop. Also the specimen (♂) I have found among DAHL's material (recorded by DAHL, 1909 as *Limosina coxata*, by DUDA, 1918 as *Scotophilella nana* RONDANI ?) was caught on a peat-bog. Thus, the species should be considered as sphagnicolous or tyrphophilous (cf. Part I). Adults were recorded from IV–VII and IX.

Distribution: Czechoslovakia (Moravia), GDR.

Spelobia (Spelobia) cambrica (RICHARDS, 1929), comb. nov.

(Figs. 678–691)

Leptocera cambrica RICHARDS, 1929: 174; NARTSHUK, 1970: 349 (key)
Leptocera (*Limosina*) *cambrica*: RICHARDS, 1930: 302
Limosina (*Limosina*) *cambrica*: DUDA, 1938: 113
Limosina cambrica: PAPP, 1973c: 59 (key)

Type material: Holotype ♂ labelled: "Breconshire: Hepster Valley 22. IV. 1927. O. W. RICHARDS. B. M. 1929. 444", "*Leptocera cambrica*, RICHARDS ♂. Type" and "Type" (on circular label with red margin); paratype ♀ labelled: "20 437", "Brecon: Hepster Valley, 22. iv. 1927", "O. W. RICHARDS Coll. B. M. 1967-510", "*L. cambrica*, RICHARDS ♀. paratype" and "Para-type" (on circular label with yellow margin) (both BML, examined). Location of the remaining 2 paratypes (see RICHARDS, 1929) unknown to me.

Material examined (besides "Type material"): 18 ♂ 13 ♀

GB: 1 ♂ (BML) – Scotland: Perths: Coshieville (PARMENTER leg.).

Czechoslovakia: 13 ♂ 13 ♀ (JRO, SMO) – Moravia: Rychlebské hory Mts.- Nýznerov, H. Jeseník Mts.-Skřítek, Rejvíz, M. Jezerná Mt., Zámčisko (ROHÁČEK leg.); Slovakia: Kremnické poh. Mts.-Turček env., Slov. Raj-V. Sokol, Belanské Tatry Mts.-Šarpanec (ROHÁČEK leg.).

Finland: 4 ♂ (ZMH) – Al: Finnström (FREY leg.); Ab: Lojo (FREY leg.); N: Helsingin ymp. (TIENSUU leg.); Ks: Salla (KROGERUS leg.).

Description:

Male. Total body length 1.67–2.13 mm, general colour brownish black, greyish brown dusted but rather shining. Head brownish black to black. Frons anteriorly often with a narrow yellowish brown margin, rest of frons black. Frontal triangle shining black, interfrontalia and orbits somewhat silvery grey glittering, narrow stripes between frontal triangle, interfrontalia and orbits blackish dusted and dull. *pvt* in 2 pairs, the posterior true *pvt* smaller but almost crossing. 3–4 (rarely 5) comparatively short *if*, the most anterior usually the smallest. 4–6 minute *ads* inside and below *ors*. Face, facial cavity and gena blackish brown to dark brown; frontal lunule usually paler brown and greyish pollinose; facial cavity shining; vibrissal angle mostly paler brown. *g* of medium length, behind it 1–2 shorter setae. Eye of normal size, its diameter about 3.2 times as long as the narrowest genal width. Antennae black, 3rd segment blackish brown, arista about 4.0 times as long as the antenna and medium long ciliate.

Thorax brownish black, mesonotum despite some greyish brown pruinosity shining, pleurae more densely pollinose and duller. 2 *hu*, the internal minute, hardly longer than an additional anteroexternal microseta on humeral callus. 2 *dc*, also the anterior robust. 8 rows of *ac* hairs in front of suture, the innermost prescutellar *ac* pair only slightly enlarged. Scutellum long, elongate triangular, *sc* long. Pleurae with yellowish or pale brown sutures between sclerites; 2 *stpl*, both thin, the anterior less than half length of the posterior one. Legs slender, brown, fore coxa, trochanters, knees and tarsi pale to yellowish brown. t_2 chaetotaxy as in Fig. 680, *av* below middle and *va* comparatively short. mt_2 long and slender. Ratio t_2: mt_2 = 1.71–1.89. t_3 slightly curved. Wing (Fig. 681) very pale brownish grey, veins yellowish brown. *C* not extended beyond R_{4+5}, the latter straight. Discal cell of medium length, with short appendages of M_{1+2} and M_{3+4} beyond t_p, the first mentioned continued by a colourless fold. Alula narrow and long, apically rounded. Wing measurements: length 1.80–2.10 mm, width 0.71–0.85 mm, *C*-index = 0.95–1.22, t_a–t_p: t_p = 2.00–2.60. Halteres yellow to yellowish brown, especially knob darker.

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Abdomen brownish black, greyish brown dusted, subshining. Terga sparsely and finely but comparatively long haired; sterna more densely haired. *T1+2* with large basal medial, weakly sclerotized and pale pigmented area. *S5* (Fig. 686) characteristically armed by 2 pairs of very long bristles arising in the middle of *S5*, on paler pigmented spots. A group of short, curved setae in front of these long bristles also distinctive. Posteromedial comb of spines simple.

Genitalia. Periandrium (Figs. 684–685) sparsely haired but with long dorsolateral bristle and long laterocaudal bristle being situated more ventrally than usual. Cerci relatively small, each with a long caudal bristle (as long as laterocaudal bristle) and about 2 minute setulae. Hypandrium comparatively short. Telomere very characteristic (Fig. 683) with slender, ventrally prolonged anterior flat lobe, very long ventral spine and micropubescence only at posterior margin (outer side almost without micropubescence). Aedeagal complex (Fig. 682) also distinctive. Phallophore somewhat projecting ventrally; postgonite long, slightly S-shaped but apically enlarged and rounded. About 3 minute setulae on outer side of apical half of postgonite. Distiphallus differing from that of other *Spelobia* s. str. only in detail. Ejaculatory apodeme present but minute.

Female. Similar to male but differs as follows. Total body length 1.82–2.38 mm. t_2 chaetotaxy (Figs. 678, 679) as in male but *av* below middle and *va* longer and stronger. Ratio $t_2 : mt_2 = 1.74–1.81$. Wing measurements: length 1.98–2.24 mm, width 0.83–0.97 mm, *C*-index = 1.00–1.17, $t_a–t_p : t_p = 2.12–2.71$. Preabdomen as in male.

Postabdomen (Figs. 687–689) highly diagnostic. *T6* and *T7* simple, sparsely haired. *T8* medially weakly sclerotized but not divided. *T9* unusually short, small, with 2 dorsal setulae. *S6* and *S7* simple. *S8* large, posteromedially somewhat membraneous and carrying 2 long hair-like bristles. Behind *S8* a minute transverse additional sclerite. *S9* large, transversely oblong, with a pair of long ventral setae. Spectacles-shaped sclerite (Fig. 691) weakly sclerotized and somewhat indistinct. Spermathecae (Fig. 690) unlike all congeners, elongate cylindrical, with long and slender sclerotized parts of ducts and somewhat impressed terminal tips. Cerci very slender and long, articulated with *T9*, usually adjoined to each other but sometimes strongly divergent owing to its movement (see Fig. 687), each with 3 longer sinuate hairs besides 2 short lateral setae. 2 small, narrow additional sclerites (Fig. 687) round the anus are probably secondary.

Discussion: The species can be readily identified primarily by its male and female terminalia but also combination of external characters (t_2 chaetotaxy, narrow alula, slender mt_2, slender and simple male t_1, *T1+2* with pale pigmented mediobasal area) are rather diagnostic. It differs essentially from all European congeners in having long paired bristles on male *S5*, telomere with prolonged and downcurved anterior corner, very long female cerci and elongate cylindrical spermathecae (only *S. parapusio* has cylindrical spermathecae but they are much shorter). *S. divergens* (Papp, 1973) from Mongolia seems to be the closest relative of *S. cambrica* (Richards) because of its slender divergent female cerci, similar t_2 chaetotaxy and alula but it differs by long middle pair of *if* and brown halteres. *S. divergens* has been described from only female so that it is impossible to evaluate its affinity more precisely.

Biology: A rare and little known species. Richards (1930) mentioned that two of type specimens were caught on decayed sheep skin. Judging from my findings, the species is probably polysaprophagous. I have found it six times on decayed fungi (5 ♂ 3 ♀), four times on red deer excrement (3 ♂ 5 ♀), once on human faeces (4 ♂ 2 ♀) and swept single specimens in woods, caught on decayed leaves and in runs of *Microtus arvalis*. *S. cambrica* seems to be associated with higher altitudes in Central Europe (all records above 700 m) and occurs in wet places in woods and peat-bogs. Adults were recorded from IV–XI (combined data of Richards, 1930 and material examined).

Distribution: Probably a Boreo-alpine species living in N. Europe and in mountains of Central Europe. Known from GB: England, Wales (Richards, 1929, 1930, 1976), Scotland, Finland (material examined, new) and Czechoslovakia (Roháček, 1978b).

Subgenus ***Bifronsina*** **subgen. nov.**

Type species: *Limosina bifrons* Stenhammar, 1854

Diagnosis: The subgenus can be characterized as follows.

(1) *pvt* in 2 pairs, the anterior pair smaller (false *pvt*)
(2) 4–5 (rarely 3) short *if* of about equal length
(3) 4–6 minute *ads* inside and below *ors*
(4) *g* small
(5) 2 *hu*, also the internal rather long but shorter than the external *hu*
(6) 3 *dc*, all postsutural
(7) 6–8 rows of *ac* microsetae; prescutellar medial *ac* pair enlarged
(8) scutellum rather shortly roundly triangular
(9) 2 *stpl*, both small and hair-like, the posterior stronger
(10) t_2 chaetotaxy (Figs. 692–694); *av* below middle distinct; a long anteroapical bristle rather characteristic
(11) *C* not extended beyond R_{4+5}

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(12) R_{4+5} straight or apically slightly recurved (Fig. 695)
(13) discal cell short, outer corners with short processes of M_{1+2} and M_{3+4} beyond t_p
(14) alula small, narrow and rather pointed
(15) female postabdomen not narrower than preabdomen at 6th segment
(16) male *S5* with posteromedial comb of spines
(17) periandrium with a long dorsolateral hair-like bristle and another longer lateral hair
(18) male cerci simple, not reduced, each with a longer seta
(19) hypandrium very small
(20) telomere longer and narrower than in *Spelobia* s. str., with micropubescence on outer side, thick and blunt ventral spine and short, peculiar setae (Fig. 697)
(21) phallophore compact, with a short anterodorsal projection
(22) distiphallus of complex structure, with various processes and arches and well sclerotized
(23) postgonite simple, slightly bent and apically pointed, with some setulae anteriorly
(24) ejaculatory apodeme not found
(25) female *T6*—*T8* simple, not divided
(26) female *T9* shortly triangular, with some dorsal setulae
(27) female *S6* and *S7* simple
(28) female *S8* with 2 lateral plates at posterior margin
(29) behind female *S8* there is a stripe divided into more minute sclerites and contacting with posterolateral parts of *T8*
(30) female *S9* rather short, flat, transverse
(31) spectacles-shaped sclerite weakly sclerotized, with large circles
(32) spermathecae tyre-shaped, sclerotized parts of ducts short
(33) female cerci short and shortly sinuate haired.

Discussion: The subgenus can be considered somewhat intermediate between *Spelobia* s. str. and *Pullimosina* gen. nov. It is characterized by a number of features distinguishing it from other subgenera of *Spelobia* (long internal *hu*, 3 *dc*, small *stpl*, small and pointed alula, narrow telomere, small hypandrium, phallophore with anterodorsal projection, complicated distiphallus, female *S8* and additional sclerites behind it), some of which indicate a resemblance to *Pullimosina* (alula, narrower telomere, complicated distiphallus, additional sclerites behind female *S8*), but in contrast to this genus it has R_{4+5} straight and not overpassed by *C*, rich t_2 chaetotaxy, telomere with robust ventral spine and male *S5* with posterior comb of short spines as other subgenera of *Spelobia*. Although *Bifronsina* subgen. nov. can be treated as a separate genus, it is tentatively incorporated into the genus *Spelobia* because of the apparent relationship with *Spelobia* s. str. and placed as its sister-group in the supposed cladogram of relationship of *Spelobia* genera-group (see the chapter "Phylogeny", Fig. 64).

The subgenus *Bifronsina* subgen. nov. contains only the type species — *S.* (*B.*) *bifrons* (STENHAMMAR, 1854) in the whole Palaearctic. However, *Leptocera* (*Scotophilella*) *elegans* SPULER, 1925, from North America might perhaps also belong to it. A study of its terminalia is necessary to demonstrate this.

Spelobia (Bifronsina) bifrons (STENHAMMAR, 1854), **comb. nov.**

(Figs. 692—706)

Limosina bifrons STENHAMMAR, 1854: 401; ZETTERSTEDT, 1860: 6406; RONDANI, 1880: 33; PAPP, 1973c: 57 (key)
Limosina (*Limosina*) *bifrons*: DUDA, 1938: 111
Leptocera bifrons: NARTSHUK, 1970: 346 (key)
Limosina puerula RONDANI, 1880: 34
Limosina (*Scotophilella*) *puerula*: DUDA, 1918: 154
Leptocera (*Scotophilella*) *puerula*: DUDA, 1925: 162 (key)
Leptocera (*Limosina*) *puerula*: RICHARDS, 1930: 302
Leptocera puerula: SÉGUY, 1934: 469
Limosina clunipes: HALIDAY, 1836: 331 nec MEIGEN, 1830

Type material:
Limosina bifrons STENHAMMAR: Described from specimens (♂ and ♀, number not specified) collected in South and Central Sweden (Ostrogothia, Scania) by STENHAMMAR (1854). The type material has not been preserved (see KIM, 1972).
Limosina puerula RONDANI: Lectotype ♀ (des. by ROHÁČEK in 1979) labelled: "Asch 1. 8. 73" and "1948" (= a catalogue No. — red numeral on oval label); paralectotypes 2 ♂ (somewhat immatures) labelled "Bozen 12. 6. 73" and "1948" (as in lectotype). All specimens in good condition (MSF).

Material examined (besides "Type material"): 51 ♂ 81 ♀

Spain: 1 ♀ (JRO) — Grazalema nr. Ronda (ROHÁČEK leg.).

DOI: 10.21248/contrib.entomol.33.1.3-195

Czechoslovakia: 42 ♂ 70 ♀ (JRO, MMB, NMP, VUP, PFB) – Bohemia: Bečov nr. Most (JEŽEK leg.), Davle (VIMMER leg.), Praha-Strašnice (KOVÁŘ leg.), Praha-Hostivař (HAVLÍK leg.), Praha-Libuš (ZUSKA leg.), Židlochovice (PULPÁN leg.), Horní Počernice, Vysoké Mýto (VALEŠOVÁ leg.), Žár (OŠMERA leg.), Palupín nr. Strmilov (ROHÁČEK leg.); Moravia: Třešť (ROHÁČEK leg.), Třebíč (VALEŠOVÁ leg.), Brno- Holásky (PŘIKRYL leg.), Hodonín (PULPÁN leg.), Lednice (VAŇHARA leg.), Dol. Věstonice (ROZKOŠNÝ leg.), Pouzdřany, Nectava, H. Jeseník Mts.-Skřítek, Hradec nr. Opava (ROHÁČEK leg.), Val. Meziříčí (VALEŠOVÁ leg.); Slovakia: Cifer (PULPÁN leg.), Turček (ROHÁČEK leg.), Zvolen (VALEŠOVÁ leg.), Lubochňa, Belanské Tatry Mts.-Plesnivec, Tatranská Kotlina (ROHÁČEK leg.), Spišská Nová Ves (VERNER leg.), Humenné (VALEŠOVÁ leg.), Král. Chlmec (VALEŠOVÁ, LAŠTOVKA leg.).

Hungary: 2 ♂ 2 ♀ (JRO) – Aranyosgadány (PAPP leg.).

Denmark: 7 ♂ 6 ♀ (ZMK) – NEJ: Laesø (MORTENSEN leg.), Skørping (LUNDBECK leg.); F: Aerø (LUNDBECK leg.); SZ: Suserup (MORTENSEN leg.); NEZ: Holte (LUNDBECK leg.), Bagsvaerd (LYNEBORG leg.).

Finland: 2 ♀ (ZMH) – Ab: Vichtis (FREY leg.).

Description:

Male. Total body length 1.07–1.26 mm, general colour brown, greyish brown dusted, subshining. Head yellowish brown. Frons anteriorly and between orbits and interfrontalia yellowish orange to yellowish brown, the rest brown and greyish brown pollinose. 2 distinct pairs of *pvt* (the anterior false pair smaller), 3–5 short *if* of about equal length, 4–6 minute *ads* inside and below *ors*, some minute hairs also on face in front of eye. Frontal lunule, face, facial cavity and gena yellow to yellowish brown, yellowish white dusted. *g* comparatively small; behind it 2–3 additional small setulae. Eye medium-sized and rather flat, its diameter about 2.7 times the narrowest genal width. Antennae with yellowish brown 2 basal segments and base of 3rd segment; apex of 3rd segment dark brown and shortly ciliate. Arista about 3.5 times as long as antenna, medium long ciliate.

Thorax brown, greyish brown dusted. Mesonotum darker and subshining, pleurae pale to yellowish brown, with yellowish white sutures between sclerites. 2 *hu*, also the internal long. 3 *dc* (all postsutural), 2 anterior short. 6–8 rows of *ac* hairs in front of suture; the medial prescutellar *ac* pair enlarged, often distinctly longer than anterior *dc*. Scutellum roundly, shortly triangular, *sc* long. 2 *stpl*, both small but the anterior shorter. Legs yellow, f_3 and t_3 sometimes darker yellowish brown. t_2 chaetotaxy (Fig. 694) with characteristic long anteroapical bristle and ventrally with distinct *av* and long *va*. Ratio $t_2 : mt_2 = 2.00-2.13$. Wing (Fig. 695) with pale greyish brown membrane, hyaline yellowish brown veins and darker brown *C* which is not produced beyond R_{4+5}. R_{4+5} almost straight but apically very slightly recurved. Discal cell short, with obtuse-angled outer corners and very short processes of M_{1+2} and M_{3+4} beyond t_p. Alula small, narrow, rather pointed. Wing measurements: length 1.06–1.22 mm, width 0.43–0.52 mm, *C*-index = 0.69–0.84, $t_a - t_p : t_p = 1.44-1.77$. Halteres with yellowish stem and yellowish brown knob.

Abdomen dark brown to blackish brown, greyish brown dusted, subshining. Terga rather weakly sclerotized, with setosity of medium length but sparse. Sterna more densely and shortly haired. *T1+2* with pale pigmented and weakly sclerotized medial tongue-shaped area. *S5* (Fig. 700) simply haired but posteromedially with a dense comb of short, blunt spines.

Genitalia. Periandrium (Figs. 698, 699) comparatively short, with a long dorsolateral hair-like bristle and somewhat longer lateral seta, otherwise shortly sparsely haired. Cerci simple, each with a longer bristle besides some minute setulae. Hypandrium small, especially its mediodistal part very shortened. Telomere (Fig. 697) characteristic, roughly triangular in profile, with micropubescence on almost the whole outer side and with numerous setiform hairs on outer side and anterior margin. There are 3 peculiar short, thick and sharply pointed setae on outer side and a robust blunt spine on distal tapered part of telomere. Aedeagal complex (Fig. 698) of very complex form, especially the distiphallus. Phallophore compact, with short anterodorsal projection. Distiphallus with lateral arches and some processes, the most striking of which is a dark, paired, mediodorsal projection. Postgonite rather simple, slightly bent and pointed, with 2 small setulae on anterior margin. Ejaculatory apodeme not observed.

Female. Similar to male but differs as follows. Total body length 1.19–1.56 mm. t_2 (Figs. 692, 693) with somewhat longer bristles, especially *av* below middle. Ratio $t_2 : mt_2 = 1.90-2.08$. Wing measurements: length 1.24–1.44 mm, width 0.51 to 0.66 mm, *C*-index = 0.76–1.02, $t_a - t_p : t_p = 1.29-2.11$. Preabdomen as in male.

Postabdomen (Figs. 701–703) short. *T6* and *T7* simple. *T8* medially not divided but strongly extended laterally. *T9* shortly triangular, apically and medially paler pigmented, dorsally with 6–8 minute setulae, the posteromedial pair of which usually the longest. *S6* simple and essentially longer than *S7*, the latter with 2 longer setae on posterior margin. *S8* highly characteristic, almost bare, medially more darkly pigmented and posteriorly tapering. Its posterior narrower part carries on each side a small flat sclerite. There is a row of minute additional sclerites posteriorly to *S8* consisting of 2 stripe-like sclerites contacting with posterolateral parts of *T8* and 4 very minute discs (each armed by a setula) between them (see Fig. 703). *S9* comparatively small, transverse and flat, with 2 longer hairs on posterior margin. Spectacles-shaped sclerite (Figs. 705, 706) weakly sclerotized but the circles comparatively large. Spermathecae (Fig. 704) tyre-shaped, with conically impressed tips and robust, short but not dilated sclerotized parts of ducts. Cerci short, strikingly pale yellowish brown, each with short apical and dorsopreapical sinuate hair and some minute setulae.

Preimaginal stages: OKELY (1974: 52, Figs. 33, 34, 41) described and illustrated the puparium. It is white translucent and small but in other respects resembles that of *Spelobia* s. str. species, having long, black, spine-like anterior spiracular processes with short papillae.

Discussion: This very distinctive species differs considerably from all other *Spelobia* species so that it was placed in a separate subgenus *Bifronsina* subgen. nov. It can be easily recognized by the pale yellowish to testaceous anterior part of frons, facial cavity, face, gena and basal antennal segments sharply contrasting with the dark posterior part of frons and occiput, by long internal *hu*, 3 *dc*, wing with slightly recurved R_{4+5} apart from the characteristic male genitalia (telomere, aedeagal complex) and female postabdomen (*T9*, *S8*, additional sclerites behind *S8*). Only *Leptocera* (*Scotophilella*) *elegans* SPULER, 1925 seems to be somewhat similar (according to original description, specimens not seen) to *S. bifrons* (STENHAMMAR) but its placement in *Bifronsina* can be confirmed only by study of its male and female terminalia.

S. bifrons was described by STENHAMMAR (1854) from some specimens from Sweden. Although the type material is apparently lost (KIM, 1972) it is easily recognizable from the original description (see DUDA, 1938) and its identity with the above species is doubtless correct because there is no similar species in Europe. *Limosina puerula* RONDANI, 1880, is synonymous with *S. bifrons* – this synonymy established by DUDA (1938) was confirmed by the study of the type material.

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Biology: *S. bifrons* is a polysaprophagous but predominantly coprophagous and phytosaprophagous species and develops mainly in manure (breeding records — PAPP, 1974c, 1975a, b) or in decayed vegetation (grass — breeding record by OKELY, 1974). It was accidentally found in burrows of mice (RICHARDS, 1930); I have collected 1 ♀ on dead *Anodonta* spec., but generally it is strongly associated with man's activities and form either symbovilous (especially stable) populations on manure heaps, dunghills, in stables (DUDA, 1918, 1938; PAPP, 1973c, 1974b, c, 1975a, b) and abattoirs (ZUSKA & LAŠTOVKA, 1969) or hemisynanthropic populations on vegetable refuse, excrement of fowls in poultry farms (ZUSKA & LAŠTOVKA, 1969) etc. I have found the asynanthropic populations on decayed grass, straw and hay in meadows or fields. Adults occur throughout the whole vegetation period (the whole year — the published data and material examined combined).

Distribution: Because of the synanthropy the species tends to be cosmopolitan but is probably of Palaearctic or Old World origin. Besides Europe, it was recorded from Azores (HACKMAN, 1960), Canary Is. (FREY, 1936; PAPP, 1977a), Egypt (HAFEZ, 1949), USSR: Tadzhikistan (PAPP, 1979a), Afghanistan (PAPP, 1975b, 1978a), Seychelles (COLLIN, 1912 as *L. clunipes*; DUDA, 1925), Samoa (DUDA, 1925), Zaire (VANSCHUYTBROECK, 1951), South Africa (HACKMAN, 1965a), Madagascar (HACKMAN, 1967b), Hawaii (RICHARDS, 1952a). European records: Spain (HACKMAN, 1969b), France (SÉGUY, 1934), GB: England (RICHARDS, 1930, 1976; OKELY, 1974), Belgium (VANSCHUYTBROECK, 1942), FRG: (DUDA, 1918), GDR (RONDANI, 1880), Czechoslovakia (RONDANI, 1880; ZUSKA & LAŠTOVKA, 1969; ROHÁČEK, 1978b, 1980), Hungary (MIHÁLYI, 1967; PAPP, 1973c, 1975a, b), Jugoslavia (COE, 1962a), Denmark (material examined, new), Finland (FREY, 1941), Sweden (STENHAMMAR, 1854; ZETTERSTEDT, 1860), USSR: Estonia (HACKMAN, 1972) but surely in all remaining European countries.

10. Genus ***Pullimosina*** **gen. nov.**

Group of *L. heteroneura*: RICHARDS, 1930: 298 (part.); ROHÁČEK, 1978c: 126 (part.)
Type species: *Limosina heteroneura* HALIDAY, 1836

Diagnosis: The genus can be characterized by the following complex of features.

(1) *pvt* small or absent
(2) 3—4 *if* (the middle often enlarged)
(3) 2—6 minute *ads* inside and below *ors*
(4) *g* small, weak
(5) 2 *hu*, the internal small
(6) 1—2 *dc*, often 1—2 additional enlarged *dc* microsetae in front or between them
(7) 6 rows of *ac* microsetae in front of suture
(8) 2 *stpl*, the anterior reduced to a microseta
(9) scutellum roundly triangular, *sc* long; sometimes (sg. *Dahlimosina*) some minute setulae between and in front of the regular *sc*
(10) t_2 chaetotaxy simple (Figs. 724—726), *av* below middle of t_2 present in female but reduced or absent in male
(11) *C* extended beyond R_{4+5}
(12) R_{4+5} slightly to distinctly bent up to *C*, ending farther from the apex of wing than unpigmented part of M_{1+2}
(13) discal cell short, its outer corners with distinct appendages of M_{1+2} and M_{3+4} (except for brachypterous forms)
(14) alula small, narrow, pointed
(15) female postabdomen short, wide at 6th segment, not distinctly narrower than preabdomen there
(16) male *S5* having various shapes and armatures
(17) periandrium usually with a long dorsolateral hair-like bristle (except for sg. *Dahlimosina*)
(18) male cerci distinct, each with 1 or more longer hairs and some small setulae
(19) hypandrium of medium length

DOI: 10.21248/contrib.entomol.33.1.3-195

(20) telomere simple, roughly squared, triangular to oblong; its outer side often with long sinuate hairs
(21) phallophore robust, compact; epiphallus not developed
(22) distiphallus well sclerotized
(23) postgonite comparatively short, with some minute setulae on outer side
(24) ejaculatory apodeme small or absent
(25) female *T8* not divided but with tripartite pigmentation, its lateral parts extended
(26) female *T9* mostly short, with a pair of dorsal setulae
(27) female *S8* transverse, sometimes large (*Dahlimosina*); between it and *S9* an additional sclerite, sometimes divided into 2 minute discs (*Dahlimosina*)
(28) female *S9* short, more or less sickle-shaped
(29) spectacles-shaped sclerite well developed
(30) spermathecae tyre to disc-shaped
(31) female cerci relatively short, with 2—3 longer sinuate hairs and some short setulae.

Discussion: The genus *Pullimosina* gen. nov. is apparently related to the genus *Spelobia* (the main shared features — simple telomere, robust and compact phallophore, tyre-shaped spermathecae, formation of the female postabdomen, tendency to brachyptery in some species) and is therefore placed as its sister-group in the supposed cladogram showing the interrelationships of the *Spelobia* genera-group (Fig. 64). The subgenus *Dahlimosina* of *Pullimosina*, being erected for the most aberrant species *P. dahli* (DUDA), forms an intermediate link between *Pullimosina* and *Spelobia* in possessing some features which indicate the evolution of *Pullimosina* from the same ancestral stock from which branched off the genus *Spelobia* (see the chapter "Phylogeny"). The most characteristic features of *Pullimosina* seem to be: R_{4+5} overpassed by *C* and terminating far in front of apex of wing; alula always small and acute; *pvt* reduced or absent; t_2 chaetotaxy rather simple, male *S5* usually without dense posteromedial comb of spines; additional sclerite between female *S8* and *S9* well developed etc.

The genus *Pullimosina* is divided into 2 subgenera, viz. *Dahlimosina* subgen. nov. containing only *P. dahli* (DUDA, 1918) and *Pullimosina* s. str. with 5 Palaearctic species also occurring in Europe, viz. *P. heteroneura* (HALIDAY, 1836), *P. antennata* (DUDA, 1918), *P. moesta* (VILLENEUVE, 1918), *P. pullula* (ZETTERSTEDT, 1847) and *P. meijerei* (DUDA, 1918). However, *Limosina longicornuta* PAPP, 1973, described from Mongolia might also belong to the genus *Pullimosina* but without study of its genitalia it is impossible to place it. On the contrary, there is a number of species from outside of Palaearctic belonging without doubt to *Pullimosina* gen. nov., viz. *P. longicosta* (SPULER, 1925) comb. nov., *P. rara* (SPULER, 1925) comb. nov. and *P. nidicola* (RICHARDS, 1964) comb. nov. from North America; *P. latipes* (DUDA, 1925) comb. nov. from Singapore; *P. heteroneuroidea* (DUDA, 1925) comb. nov. from East Africa; *P. costata* (RICHARDS, 1968) comb. nov. from South Africa and P. *paramoesta* (DUDA, 1925) from South America. Possibly some more extra-Palaearctic species will be transferred to *Pullimosina* in the future, after direct examination.

Key to European subgenera and species

1 Scutellum with some minute additional setulae between basal and apical *sc* and in front of basal *sc* (Fig. 710); only 1 *dc*; R_{4+5} more straight and less overpassed by *C* (Fig. 711). Periandrium without any longer hair (Fig. 714); female *S8* large (Fig. 719) (*Dahlimosina* subgen. nov.) — Telomere (Fig. 713), aedeagal complex (Fig. 712), female postabdomen (Figs. 717—719), spectacles-shaped sclerite (Fig. 720—721), spermathecae (Fig. 722) . . . . . *P. (D.) dahli* (DUDA)

— Scutellum with only the usual 2 pairs of *sc*; R_{4+5} more curved up and far overpassed by *C* (Fig. 727, 745; except for f. brach.); 2 *dc* and often 1—2 shorter setae in addition. Periandrium with a long dorsolateral hair; female *S8* smaller, shorter (*Pullimosina* s. str.) 2

2(1) Wing normal, t_a—t_p shorter than t_p (Fig. 727), 4 *if* of almost equal length, telomere without long pale hairs externally (Fig. 729), female *T9* longer than cerci (Fig. 733) . . . . . *P. (P.) heteroneura* (HALIDAY)

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— Wing either distinctly abbreviated (Figs. 790, 791) or normal but in such case $t_a - t_p : t_p$ always longer than t_p (Fig. 745); 3 *if*, the middle of which enlarged, telomere with long sinuate hairs externally, female *T9* shorter than cerci . . . 3
3(2) Facial cavity blackish brown, wings never reduced 4
— Facial cavity yellow, wings normal or reduced 5
4(3) *T1+2* medially with paler pigmented and weakly sclerotized area (Fig. 769), male *S5* with a pair of conical processes on posterior margin (Fig. 762), telomere with hind corner pointed (Fig. 759), female postabdomen as in Figs. 763—765, spectacles-shaped sclerite as in Figs. 767, 768 . . *P.* (*P.*) *moesta* (VILLENEUVE)
— *T1+2* simply pigmented and sclerotized, male *S5* without conical processes on posterior margin (Fig. 750), telomere with fore corner pointed (Fig. 747), female postabdomen as in Figs. 751—753, spectacles-shaped sclerite as in Figs. 755, 756 . . . . . *P.* (*P.*) *antennata* (DUDA)
5(3) *T1+2* medially with a pale pigmented and weakly sclerotized area (Fig. 785), male *S5* with a row of blunt spines on posterior margin (Fig. 788), male genitalia smaller, anal opening large, roundly triangular (Fig. 780), telomere more or less triangular (Fig. 778). Female postabdomen (Figs. 782—784), *T8* without a medial tubercle, spectacles-shaped as in Figs. 786, 787 . . . . . *P.* (*P.*) *pullula* (ZETTERSTEDT)
— *T1+2* simply pigmented on the whole surface, male *S5* with a crown of short, robust spines and rather deep incision in the middle of posterior margin (Fig. 802), male genitalia large with small, oval anal opening (Fig. 795), telomere (Fig. 793) square in shape. Female postabdomen (Figs. 796—798), *T8* with conspicuous medial tubercle, spectacles-shaped sclerite (Figs. 800, 801) robust. Brachypterous form (Figs. 790, 791) predominates over the macropterous one . . . . . *P.* (*P.*) *meijerei* (DUDA)

Subgenus ***Dahlimosina*** **subgen. nov.**

Type species: *Limosina* (*Scotophilella*) *Dahli* DUDA, 1918

Diagnosis: The subgenus can be defined as follows.
(1) *pvt* very minute
(2) 3—4 small *if* of about equal length
(3) 4—6 minute *ads* inside and below *ors*
(4) *g* small
(5) 2 *hu*, the internal small
(6) only 1 (prescutellar) *dc*, *dc* microsetae in front of it may be somewhat enlarged
(7) *ac* microsetae in 6 rows in front of suture
(8) 2 *stpl*, the anterior minute, the posterior also rather weak
(9) scutellum with some small additional setulae between basal and apical *sc* and in front of basal *sc* (Fig. 710)
(10) t_2 chaetotaxy (Figs. 707—709), *av* below middle of t_2 present only in female
(11) *C* distinctly produced beyond R_{4+5}
(12) R_{4+5} slightly bent up to *C*, ending nearer the apex of wing than would have the unpigmented part of M_{1+2}
(13) discal cell short, its outer corners with short processes of M_{1+2} and M_{3+4}
(14) alula small, narrow, pointed
(15) female postabdomen not strikingly narrower than preabdomen
(16) male *S5* with several posteromedial combs of spines
(17) periandrium without dorsolateral long hair
(18) male cerci distinct, each with 1 longer hair and some small setulae
(19) hypandrium of medium length, rod-like
(20) telomere simple, roundly oblong, externally with some longer hairs
(21) phallophore robust, compact, without epiphallus
(22) distiphallus more simple than in *Pullimosina* s. str.

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(23) postgonite comparatively short, with some small external setulae
(24) ejaculatory apodeme small, weakly sclerotized
(25) female *T8* with tripartite pigmentation and medially less sclerotized
(26) female *T9* short, with a pair of dorsal setae
(27) female *S8* long, tapering posteriorly, posterior corners wholly rounded; additional sclerite behind *S8* reduced to 2 lateral minute discs
(28) female *S9* short, transverse, somewhat sickle-shaped
(29) spectacles-shaped sclerite with heavily sclerotized medial part
(30) spermathecae tyre-shaped and rather long
(31) female cerci rather short, with 3 sinuate longer hairs and 2 short curved setae.

Discussion: The subgenus shares with the subgen. *Pullimosina* s. str. some supposedly synapomorphic features (reduced *pvt*, reduced *av* on male t_2, R_{4+5} overpass by *C*, similar formation of the aedeagal complex, female *T8* with tripartite pigmentation, reduced female *S9*) but also some characters considered as plesiomorphic are rather characteristic for both these subgenera (e.g. simple telomere without robust spine). *Dahlimosina* subgen. nov. differs from *Pullimosina* s. str. mainly by additional setulae on scutellum, only 1 *dc*, more straight R_{4+5}, absence of dorsolateral hair on periandrium, more simple distiphallus, large female *S8*. Although some of these features are obviously apomorphic (see cladogram in Fig. 64), the subgenus seems to be more primitive than *Pullimosina* s. str. and indicates some affinity with the genus *Spelobia*, especially its sg. *Bifronsina* (male *S5* with comb of dense spines, R_{4+5} more straight and not too far overpassed by *C*, large female *S8*, small relics of additional sclerite behind female *S8*, and small alula in *Bifronsina*). Thus, to summarize, *Dahlimosina* subgen. nov. appears to be somewhat intermediate between the subgenera *Spelobia* (*Bifronsina*) and *Pullimosina* (s. str.), but it is much closer to the latter and is therefore placed to the genus *Pullimosina*.

Dahlimosina subgen. nov. includes only the type-species, viz. *P. dahli* (DUDA, 1918). I know no other species in the Palaearctic which might belong to this subgenus[9].

Pullimosina (Dahlimosina) dahli (DUDA, 1918), **comb. nov.**

(Figs. 707–722)

Limosina (*Scotophilella*) *Dahli* DUDA, 1918: 125; 1928: 165
Leptocera (*Scotophilella*) *Dahli*: DUDA, 1925: 157 (key)
Limosina (*Limosina*) *Dahli*: DUDA, 1938: 118
Leptocera dahli: NARTSHUK, 1970: 347 (key)
Limosina Dahli: PAPP, 1973c: 53 (key)

Type material: Holotype, sex unknown: a slide with one wing, fore, mid and hind leg, labelled: "Plagefenn Hochmoor, 5. V. 12. DAHL" (see DUDA, 1918: 125). This slide has not been rediscovered in DAHL's collection (ZMB) and seems to be lost (Dr. H. SCHUMANN, letter communication, 1978) (not examined).

Material examined: 14 ♂ 12 ♀
FRG: 1 ♂ 2 ♀ – without further data (DUDA leg.).
Czechoslovakia: 12 ♂ 10 ♀ (JRO, SMO) – Bohemia: H. Blatné (distr. K. Vary) (KODYS leg.), Palupín nr. Strmilov (ROHÁČEK leg.); Moravia: Řásnánr. Telč, H. Jeseník Mts.-Skřítek, Rejvíz (ROHÁČEK leg.).
USSR: 1 ♂ (ZMH) – Kr: Paanajärvi (FREY leg.).

Description:

Male. Total body length 1.15–1.37 mm, general colour black, sparsely brown dusted, shining. Head black, shining. Frons with sparsely brownish black dusted stripes between interfrontalia, frontal triangle and orbits. Interfrontalia and orbits silvery shining, frontal triangle long, black and shining. *pvt* very minute and hardly discernible, 3–4 small *if* of about equal length, 4–6 minute *ads*. Frontal lunule black and despite some brown pollination shiny, similarly gena and face. Facial cavity glabrous and lustrous. *g* small. Eye normal, its largest diameter about 4.1 times the narrowest genal width. Antennae brownish black, 3rd segment with longer ciliation than the medium long ciliate arista. Arista about 3.2 times as long as antenna.

Thorax black, sparsely brown pollinose and especially mesonotum shining. Mesonotal chaetotaxy: 1 *dc* in prescutellar position, *dc* microsetae in front of it somewhat longer than *ac* hairs; latter arranged in 6 rows in front of suture; prescutellar medial *ac* pair somewhat enlarged. Scutellum besides 2 usual pairs of *sc* with 3 or 2 additional minute setulae between basal and apical *sc*, and 1–2 similar setulae in front of basal *sc* (Fig. 710). Pleurae pruinose and subshining, sternopleuron with a shiny anterodorsal spot and a small shiny area above mid coxa. 2 *stpl*, the anterior minute, also the posterior comparatively weak. Legs brownish black, only trochanters and knees paler brown. t_2 chaetotaxy (Fig. 709) ventrally with only a short *va*. Ratio t_2: mt_2=1.65–1.74. Wing (Fig. 711) pale brownish, veins brown. *C* overpassing R_{4+5} thought usually not very far. R_{4+5} very slightly bent up to *C*, sometimes almost straight. Discal cell relatively short, with anterior outer corner regularly obtuse-angled; both pigmented processes of M_{1+2} and M_{3+4} developed, that of M_{3+4} usually longer. Alula small, narrow, acute. Wing measurements: length 1.07–1.23 mm, width 0.49–0.56 mm, *C*-index = 0.88–1.04, t_a–t_p: t_p = 1.70–2.25. Halteres with yellowish stem and dark brown knob.

Abdomen blackish brown, brown pruinose, rather shining. Terga very sparsely and shortly haired, sterna haired more densely. *T1+2* not longer than *T3* and *T4* together, simply pigmented, without any pale pigmented area. *S5* (Fig. 716) posteromedially with five combs of spines, but only the most posterior comb composed of larger and shortly pointed spines. Disc of *S5* sparsely setose.

[9] *Pullimosina* (*D.*) *Karelica* (PAPP, 1979b) comb. nov., described recently from Karelia, also belongs to *Dahlimosina* it is very close (if not conspecific) to *P. dahli* (DUDA).

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Genitalia. Periandrium (Figs. 714, 715) sparsely and uniformly haired, without dorsolateral hair-like bristle. Cerci distinct, each with 1 longer seta and some minute setulae. Hypandrium of medium length. Telomere (Fig. 713) simple, roundly oblong, with some longer hairs especially on posterior margin, anteroventrally with a short process and externally with 2–3 short conical spines. Aedeagal complex (Fig. 712) with robust, compact phallophore and heavily sclerotized distiphallus with robust paired and dark pigmented subapical processes. Postgonite rather short, curved and apically pointed, in apical third with some minute external setulae. Ejaculatory apodeme present, but thin and weakly sclerotized.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.23–1.37 mm. t_2 chaetotaxy (Figs. 707, 708) with longer *va* and distinct (even if small) *av* in apical two-fifths. Ratio t_2: $mt_2 = 1.64$ to 1.82. Wing measurements: length 1.20–1.44 mm, width 0.53–0.62 mm, *C*-index = 1.00–1.12, $t_a - t_p$: $t_p = 1.82–2.20$.

Postabdomen (Figs. 717–719) short, not essentially narrower than preabdomen. *T6* and *T7* simple, *T8* with tripartite pigmentation (the medial part distinctly paler pigmented) and enlarged lateral parts. *T9* short, with a pair of dorsal setae. *S6* and *S7* simple, transversely oblong. *S8* comparatively large (longer than that of *Pullimosina* s. str.), characteristically pigmented and with a small medial tubercle on posterior margin. Additional sclerite reduced to 2 small oval lateral discs. Spectacles-shaped sclerite well developed, its medial part especially robust and heavily sclerotized (Figs. 720, 721). *S9* short, transverse, slightly sickle-shaped, with 2 posterolateral setulae. Spermathecae (Fig. 722) tyre-shaped but relatively long, with very short sclerotized parts of ducts. Cerci short, each with 3 longer sinuate hairs and 2 small curved setulae.

Discussion: The species is an aberrant representative of the genus *Pullimosina*, distinguished by number of important features (see key and discussion under sg. *Dahlimosina*) and for this reason it is placed to a separate subgenus.

The species was described from a slide with one wing and one of fore, mid and hind legs each (DUDA, 1918). This slide is considered a holotype but is now probably lost. However, I studied 1 ♂ 2 ♀ from which DUDA (1928) completed his previous description. It is noteworthy that DUDA (1928, 1938) wholly overlooked the additional setulae on scutellum as well as the small *av* on female t_2 and wrongly placed his species near to *Minilimosina fungicola* (HALIDAY).

Biology: *P. dahli* seems to be strictly confined to peat-bogs and peat-bog meadow communities. DAHL's (DUDA, 1918) and DUDA's (1928) specimens were collected on peat-bog and I have obtained it by sweeping over peat-bog meadows or by sifting Sphagnum. Therefore, it would be called as "sphagnicolous" species. Adults occur in III, V, VII, IX, X (combined data of DUDA, 1918, 1928 and material examined), but are rare even in suitable biotopes (the populations of this species have always very low density so that it is difficult to collect it in larger numbers).

Distribution: Apparently a Boreo-alpine species, recorded from GDR, FRG (DUDA, 1918, 1928, 1938), Czechoslovakia (ROHÁČEK, 1978b), Finland (FREY, 1941; HACKMAN, 1967a) and USSR: Karelia (material examined, new). FREY's (1941) record probably refers to a different species (I have seen some specimens of *Minilimosina fungicola* and *M. parvula* identified by R. FREY as *L. Dahli*).

Subgenus ***Pullimosina*** s. str.

Group of *L. heteroneura* HALIDAY: RICHARDS, 1930: 298 (part.)
Limosina heteroneura-group: ROHÁČEK, 1978c: 126
Type species: *Limosina heteroneura* HALIDAY, 1836

Diagnosis: The subgenus is characterized as follows.

(1) *pvt* small or absent
(2) 3–4 *if*, the middle pair often enlarged
(3) 2–5 very minute *ads* inside and below *ors*
(4) *g* weak, not longer than peristomal hairs
(5) 2 *hu*, the internal small
(6) 2 *dc* but often also 1–2 somewhat enlarged *dc* microsetae in front or between them
(7) *ac* hairs in 6 rows between anterior *dc*
(8) 2 *stpl*, the anterior reduced to a microseta
(9) scutellum with only 2 usual pairs of *sc*
(10) t_2 chaetotaxy (Figs. 724–726); *av* below half of t_2 distinct in female, reduced or absent in male; also *va* very reduced in male t_2
(11) *C* produced far beyond R_{4+5}
(12) R_{4+5} more or less curved up to *C*, ending farther from the apex of wing than the unpigmented part of M_{1+2} (except for the brachypterous forms)

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(13) discal cell short, its outer corners with distinct processes of M_{1+2} and M_{3+4} (with exception of brachypterous forms)
(14) alula small, narrow, pointed
(15) female postabdomen not strikingly narrower than preabdomen at 6th segment
(16) male *S5* of various shape and armature but posteromedially without a dense comb of spines
(17) periandrium with a long dorsolateral hair
(18) male cerci distinctly developed, each with 1 or more longer hairs besides short setulae
(19) hypandrium of medium size
(20) telomere roughly square-shaped, its external side usually with long sinuate hairs
(21) phallophore robust, compact, without epiphallus
(22) distiphallus complicated, with various projections and processes
(23) postgonite mostly short, with some very small setulae
(24) ejaculatory apodeme small or absent
(25) female *T8* not divided but with tripartite pigmentation and extended lateral lobes
(26) female *T9* usually short, transverse, with a pair of dorsal setae
(27) female *S8* transverse, rather small, between it and *S9* an additional small plate connected with spectacles-shaped sclerite
(28) female *S9* short, more or less sickle-shaped
(29) spectacles-shaped sclerite well sclerotized and pigmented
(30) spermathecae tyre or disc-shaped
(31) female cerci rather short, each with 2—3 wave-shaped hairs and some small setulae.

Discussion: The subgenera *Pullimosina* s. str. and *Dahlimosina* subgen. nov. have a number of features in common, see discussion under the latter subgenus. *Pullimosina* s. str. is distinguished by scutellum with only 2 usual pairs of *sc*, 2 *dc* (and sometimes further enlarged microsetae), R_{4+5} ending far in front of apex of wing and far overpassed by *C*, periandrium with a long dorsolateral hair, distiphallus more complicated, female *S8* smaller, additional sclerite behind it well developed. Some of these features are fairly progressive and autapomorphic (see cladogram in Fig. 64) and therefore, the subgenus is thought to be more advanced than its sister-group subgen. *Dahlimosina* which has more affinity to the genus *Spelobia* (see the chapter "Phylogeny").

The subgenus *Pullimosina* s. str. includes 5 European species, enummerated in the discussion under the genus (see p. 99).

Pullimosina (Pullimosina) heteroneura (Haliday, 1836), comb. nov.

(Figs. 724—738)

Limosina heteroneura Haliday, 1836: 331; Stenhammar, 1854: 410; Zetterstedt, 1860: 6408; Rondani, 1880: 24; Papp, 1973c: 40 (key); Roháček, 1975b: 203; 1978c: 129
Limosina (Scotophilella) heteroneura: Duda, 1918: 188
Leptocera (Scotophilella) heteroneura: Duda, 1925: 164 (key)
Leptocera (Limosina) heteroneura: Richards, 1930: 298; 1973: 371; Harrison, 1959: 268
Leptocera heteroneura: Séguy, 1934: 466; Nartshuk, 1970: 345 (key)
Limosina (Limosina) hetroneura: Duda, 1938: 130
Limosina Jeanneli Bezzi, 1911: 69
Limosina (Limosina) heteroneura var. *Jeanneli*: Duda, 1938: 130
Limosina fuscilabris Stenhammar, 1854: 410 (nom. nudum)

Type material:
Limosina heteroneura Haliday: Lectotype ♂ (des. by Roháček in 1978) labelled: "Holywood" (green label), "Haliday 20. 2. '82" (registration number of museum), "*heteroneura*" (Collin's handwriting) and "Named by J. E. Collin" (in good condition). Paralectotypes: 3 ♀ labelled: "Ireland" (green label), other labels as in lectotype; 1 ♂ 2 ♀ labelled: "British", "Haliday 20. 2. '82" and "Named by J. E. Collin" (NMI).
Limosina Jeanneli Bezzi: Described from 20 syntypes originating from Algeria: "Rhar Ifri, au Djebel Bou-Zegza, 1 ♂ 12. 9. 1906"; "Grotte du Lac souterrain á Hammam Meskoutine, 19 specimens (♂ and ♀) 21. 10. 1909" (Bezzi, 1911) (not examined). No type specimen was found in the Bezzi's collection (MCM — Dr. C. Leonardi, letter communication, 1979), and the deposition of collection of M. Racovitza (which might contain some syntypes) is unknown to me.

Material examined (besides "Type material"): 220 ♂ 252 ♀

Spain: 105 ♂ 110 ♀ (JRO) — Salou nr. Tarragona, Tortosa env., Gandia env., Cullar de Baza env., Güejar Sierra nr. Granada, Sierra Nevada-Llano Prado, Grazalema nr. Ronda, Zanara nr. Ronda (Roháček leg.).

Italy: 1 ♂ (MCV) — Piano Grande-Mti Sibillini (Paoletti leg.).

Austria: 1 ♂ 9 ♀ (NMP, IZI) — Dornbach bei Wien (Kowarz leg.); Tyrol: Obergurgl Mt. (Troger leg.).

Czechoslovakia: 92 ♂ 101 ♀ (JRO, JZP, MMB, NMP, PFB, SMO) —Bohemia: Veselí n. L. (Karas leg.) and localities given by Roháček (1978c); Moravia: Hradec n. M., Hor. Benešov, Úvalno, Hněvošice (distr. Opava), Valtice (Roháček leg.) and localities given by Roháček (1978c); Slovakia: Kremnické poh.-Turček env., Patince nr. Komárno (Roháček leg.).

DOI: 10.21248/contrib.entomol.33.1.3-195

Bulgaria: 3 ♂ 2 ♀ (IZS) — Klissura, Belogradizik, Burgas-Jitarevo, Burgas-Garda, Plana (BESHOVSKI leg.).

Denmark: 16 ♂ 30 ♀ (ZMK) — WJ: Tipperne (SØGAARD leg.); NWJ: Humlun (LYNEBORG leg.); F: Humble (MARTIN leg.); LFM: Nysted (LUNDBECK leg.); SZ: Suserup (MORTENSEN leg.); NWZ: Nykøbing (MORTENSEN leg.); NEZ: Uttersley Mose (SCHLICK leg.), Lyngby (LUNDBECK leg.), Holte (MORTENSEN leg.), Virum (BUCH leg.), Bagsvaerd (LYNEBORG leg.).

Finland: 1 ♂ (ZMH) — N: Evitskog (HACKMAN leg.).

USSR: 1 ♂ (ZMH) — Kola Peninsula: lake Imandra (INBERG leg.).

Description:

Male. Total body length 0.95—1.44 mm, general colour brown to blackish brown. Head with brownish black frons and brown facial cavity and gena. Frons with shiny and rather broad frontal triangle, silvery grey dusted interfrontalia, orbits and ocellar triangle, the rest brownish black pollinose and dull. *pvt* distinct though small, *occe* and *occi* comparatively strong. 4 *if*, one of 2 middle pairs often slightly longer and the most anterior usually shorter than others. 3—5 minute *ads* inside and below *ors*. Frontal lunule brown to yellowish brown (mainly basally), greyish brown dusted. Facial cavity rather shining; face very narrow, gena brown, dusted and dull. *g* small, hardly longer than peristomal setulae. Eye normal, its largest diameter about 3.4 times as long as the narrowest genal width. Antennae with 2 basal segments brown, 3rd segment darker, blackish brown; arista about 3.3 times as long as antenna, medium long ciliate.

Thorax dark brown, greyish brown dusted. Mesonotum rather shiny, pleurae paler brown and more heavily dusted, subshiny. 2 *hu*, also the smaller internal distinct. 2 *dc* (behind suture) but also a microseta between them often enlarged. 6 rows of *ac* hairs between anterior *dc*, the medial prescutellar *ac* pair a little enlarged. Scutellum roundly trapezoidal, *sc* long. Pleurae with yellowish sutures between sclerites; 2 *stpl* but the anterior minute. Legs pale yellowish brown, fore coxa and trochanters the palest. t_2 chaetotaxy as in Figs. 726, *av* below middle not developed, *va* very shortened. Ratio t_2: mt_2 = 2.15—2.48. Wing (Fig. 727) with pale brownish membrane, veins pale brown, *C* darker and very far extended beyond R_{4+5}. R_{4+5} comparatively slightly curved up to *C* but ending far in front of apex of wing. Discal cell short, broad, with both processes of M_{1+2} and M_{3+4} distinct. t_a—t_p shorter than t_p. Alula small, narrow, acute. Wing measurements: length 0.92—1.33 mm, width 0.38—0.58 mm, *C*-index = 0.83—1.20, t_a—t_p : t_p = 0.44—0.75. Halteres yellowish, knob somewhat darker and greyish dusted.

Abdomen brownish black, greyish brown pollinose, subshiny and shortly haired. *T1+2* with medial pale pigmented basal area as in *P. moesta*. Male *S5* (Fig. 732) with a medial incision on posterior margin and in front of it with two groups of short, thick and densely arranged bristles. Postabdomen large in consequence of well developed *S6* and *S7*.

Genitalia. Periandrium (Figs. 730, 731) relatively sparsely haired, with a long dorsolateral hair-like bristle; cerci below anal opening each with 2 longer and some short bristles. Hypandrium of medium length, rod-like. Telomere (Fig. 729) with hind corner protruding downwards, fore corner rounded; outer side of telomere without wavy hairs, rather long bristles situated only on hind and lower margins. Aedeagal complex (Fig. 728) characterized by simple robust phallophore; distiphallus complex, dorsally with a single slender process. Postgonite slender, pointed, with some hardly discernible setulae in apical third. Ejaculatory apodeme not observed.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.04 to 1.56 mm. t_2 (Figs. 724, 725) with distinct *av* below middle and long *va*. Ratio t_2: mt_2= 1.81—2.07. Wing with t_a—t_p usually longer than in male but always shorter than t_p. Wing measurements: length 1.03—1.45 mm, width 0.45—0.69 mm, *C*-index = 0.95—1.14, t_a—t_p : t_p = 0.45—0.91.

Postabdomen (Figs. 733—735). *T8* laterally greatly widened, its pigmentation as in Fig. 733. *T9* relatively large and long, more or less rounded, medially paler pigmented than laterally, with 2 dorsal hairs. *S8* wide anteriorly, posteriorly strongly tapering. *S9* with a pair of small bristles; between *S9* and spectacles-shaped sclerite a weakly sclerotized and pale pigmented plate. Spectacles-shaped sclerite (Figs. 737, 738) rather weakly sclerotized but well developed. Spermathecae tyre-shaped, with impressed terminal tips and short sclerotized ducts (Fig. 736). Cerci small, with a long apical and some short dorsolateral sinuate hairs.

Preimaginal stages: GODDARD (1938: 242, Fig. 4) described and illustrated the puparium, cephalopharyngeal skeleton of larva and egg. The puparium resembles those of other *Pullimosina* species, especially that of *P. moesta*, having similar spine-like but comparatively short anterior spiracular process.

Discussion: *P. heteroneura* (HALIDAY) differs from all other Palaearctic *Pullimosina* species in having 4 more or less equally long *if*, t_a—t_p always shorter than t_p (wing never reduced), telomere without dense sinuate hairs and relatively long female *T9* apart from further details in the male and female terminalia. *P. rara* (SPULER, 1925) from North America seems to be its closest congener (if not identical with it) having similarly formed venation including the shortened t_a—t_p.

Limosina jeanneli BEZZI, 1911, has been synonymized with *P. heteroneura* by VILLENEUVE (1914) who had apparently studied BEZZI's types. Although VENTURI (1965) considered *L. jeanneli* to be a valid "physogastric" species, I cannot accept his arguments because physogastry is a phenomenon occurring in gravid females of various taxa (including *P. heteroneura*) and not a suitable character for the separation of species (see also Part 1). VENTURI (1965) had not examined any material of *L. jeanneli* and therefore I agree with VILLENEUVE (1914). I have seen some specimens of *P. heteroneura* taken in caves and preserved in alcohol and they, having been somewhat macerated, fully agreed with BEZZI's (1911) description. I should like also point out that *P. heteroneura* is one of the commonest species in the Mediterranean often occurring in numbers in various shady and wet habitats.

Biology: Rather ubiquitous and apparently polysaprophagous species developing mainly in various decayed vegetation (breeding records — RICHARDS, 1930; GODDARD, 1938) but found also on the excrement of domestic mammals (breeding record — PAPP, 1974b), in garden compost heaps (DUDA, 1938), on carrion (ROHÁČEK, 1975b), in burrows of small mammals (RICHARDS, 1930; HACKMAN, 1967a) and in caves (BEZZI, 1911; RICHARDS, 1961; PAPP, 1978b). It was recorded as frequent in various buildings of the food

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industry (poultry farms, greengroceries, abattoirs — ZUSKA & LAŠTOVKA, 1969) and on dump heaps where it forms successful synanthropic populations. Adults occur during the whole vegetation period, most commonly in autumn or late summer (RICHARDS, 1930; PAPP, 1973c). The life-history of *P. heteroneura* lasted 31—38 days under laboratory conditions. The female laid 60—70 eggs on the surface of the substrate. Larvae emerged from eggs after 2 days (GODDARD, 1938). The duration of larval and pupal stages is unknown.

Distribution: Cosmopolitan, originally Palaearctic or Holarctic species, known from the whole of Europe but rarer in the north. Besides Europe recorded from Madeira (DUDA, 1918), Azores (HACKMAN, 1960), Canary Is. (FREY, 1936; HACKMAN, 1958), Algeria (BEZZI, 1911), Tunisia (DUDA, 1918; PAPP, 1977b), USSR: Tadzhikistan (PAPP, 1979a), Afghanistan (RICHARDS, 1961; PAPP, 1976b, 1978a), Formosa (DUDA, 1925), USA (RICHARDS, 1965); spread by man also to Africa (Uganda — DUDA, 1925), Australia (RICHARDS, 1973), New Zealand (HARRISON, 1959) and Hawaii (TENORIO, 1968).

Pullimosina (Pullimosina) antennata (DUDA, 1918), **comb. nov.**

(Figs. 739—741, 745—756)

Limosina (Scotophilella) antennata DUDA, 1918: 170 (part.)
Limosina antennata: ROHÁČEK, 1978c: 131
Leptocera (Scotophilella) moesta: DUDA, 1925: 165 (key) (part.)
Limosina (Limosina) moesta: DUDA, 1938: 133 (part.)
Limosina moesta: ROHÁČEK, 1975b: 203 (part.)

Type material: Lectotype ♂ (des. by ROHÁČEK in 1977) labelled: "Herten West. f. DUDA", "3 4 16" and "*antennata*", "*moesta* VILL." in DUDA's handwriting (ZMB). Genitalia and abdomen detached and preserved in a microvial pinned below type specimen.

Material examined (besides "Type material"): 44 ♂ 51 ♀

Czechoslovakia: 39 ♂ 39 ♀ (JRO, SMO) — Bohemia: see ROHÁČEK (1978c); Moravia: Řásná nr. Telč, Pálava, Úvalenské louky (distr. Opava), H. Jeseník-V. Kotlina (ROHÁČEK leg.) and localities given by ROHÁČEK (1978c); Slovakia: Belanské Tatry Mts.-Dolina siedmi prameňov, Tatranská Kotlina-Šarpanec (ROHÁČEK leg.) and localities given by ROHÁČEK (1978c).

FRG: 1 ♂ (ZMB) — Rheinland: St. Wendel (DUDA leg.).

Denmark: 1 ♂ 2 ♀ (ZMK) — EJ: Ry (LUNDBECK leg.); WJ: Esbjerg (MORTENSEN leg.); NEZ: Geel Skov (MORTENSEN leg.).

Finland: 3 ♂ 8 ♀ (ZMH) — Ab: Runsala, Karislojo (FREY leg.), Lojo, Nystad (HELLÉN leg.); N: Helsinge-Linna, Kyrkslätt (FREY leg.), Tvärmine (HACKMAN leg.); Ta: Birkkala, Messuby (FREY leg.); Om: Nykarleby (JUNGERSTEN leg.).

USSR: 2 ♀ (ZMH) — Ib: Terijoki, Nykyrka (FREY leg.).

Description:

Male. Total body length 1.15—1.41 mm, general colour blackish brown. Head blackish brown; frons dark greyish brown, on orbits and interfrontalia somewhat silvery grey pollinose. Frontal triangle long and shining. *pvt* small, hardly separable from postocellar setae, *occi* and *occe* comparatively robust. 3 *if*, the middle pair the longest and usually crossing; 3—5 minute *ads*. Carina, face and gena brown, greyish brown pollinose; facial cavity dark brown and relatively shining. *g* small, hardly stronger than peristomal hairs. Eye normal but smaller than in *L. pullula*, its diameter about 3.1 times the smallest genal width. Antennae black or brownish black, 3rd segment with strikingly long pale pilosity being about twice as long as that of arista. Arista about 3.2 times as long as antenna.

Thorax blackish brown, brown pollinose, subshining. 2 *hu*, the internal short but not reduced to a microseta; 2 postsutural *dc*, sometimes 1 *dc* microseta between them or that in front of suture slightly enlarged. 6 rows of *ac* hairs in front of suture; the medial prescutellar *ac* pair enlarged and almost as long as the anterior *dc*. Scutellum shortly roundly triangular, *sc* long. Pleurae more heavily dusted and duller; sutures between pleural sclerites yellowish brown. 2 *stpl*, the anterior minute. Legs brown with paler trochanters, knees and tarsi; fore coxa pale brown and heavily silvery grey dusted. t_2 chaetotaxy as in Fig. 741, *av* below middle of t_2 absent and *va* short. Ratio t_2: mt_2 = 1.85—2.00. Wing (Fig. 745) never abbreviated, with very pale brownish membrane (paler than in *P. pullula*), veins pale brown. *C* darker brown and very far extended beyond R_{4+5}. R_{4+5} basally straight but strongly divergent from the longitudinal axis of wing, apically slightly bent to *C* and ending farther from the apex of wing than unpigmented part of M_{1+2}. Discal cell short, but t_a—t_p always longer than t_p. Both short appendages of M_{1+2} and M_{3+4} beyond t_p developed and pigmented. Alula small, narrow, acute. Wing measurements: length 1.18—1.30 mm, width 0.49—0.55 mm, *C*-index = 0.91—1.04, t_a—t_p: t_p = 1.18—1.72. Halteres brown, with pale brownish or yellowish stem.

Abdomen grey dusted and shortly haired especially dorsally. *T1+2* without any membraneous or pale pigmented area. Male *S5* (Fig. 750) simple, medially in front of posterior margin (not incised) with two groups of short and small setae.

Genitalia. Periandrium (Figs. 748, 749) sparsely haired, with a long dorsolateral hair; cerci below anal fissure with 1 longer and 1 small bristle each. Hypandrium rod-like, of medium length. Telomere (Fig. 747) square-shaped, with slender and pointed anterior lower corner and blunt hind corner; its outer side densely and long wavy haired. Aedeagal complex as in Fig. 746, aedeagus consisting of robust phallophore and complex distiphallus which carries a mediodorsal slender and apically shortly bifurcate projection and 3 finger-like processes on each lateroapical lobe. Postgonite short, apically curved, with some very minute setulae on the pointed apex. Ejaculatory apodeme present but very small.

Female. Similar to male but differs as follows. Total body length 1.25—1.66 mm. Antenna with shortly ciliate 3rd segment; this pilosity hardly longer than that of arista. t_2 chaetotaxy (Figs. 739, 740) with *av* distinctly developed and *va* much longer. Ratio t_2: mt_2 = 1.80—1.96. Wing measurements: length 1.20—1.45 mm, width 0.57—0.63 mm, *C*-index = 0.89 to 1.18, t_a—t_p : t_p = 1.38—1.81.

Postabdomen (Figs. 751—753). *T8* with tripartite pigmentation and laterally widened. *T9* short, pigmented only at base, with 2 dorsal bristles. *S8* short, transversely oval, with 2 long lateral hairs on hind margin. *S9* very short, horseshoe-shaped. In front of *S9* a small plate connected with spectacles-shaped sclerite which is of rather complex form (Figs. 755, 756). Spermathecae (Fig. 754) similar to those of preceding species. Cerci relatively short, each with a long sinuate apical hair and 2 shorter dorsolateral preapical hairs.

Discussion: *P. antennata* (DUDA) is very closely related and similar to *P. moesta* (VILLENEUVE). The only reliable external features distinguishing these species are the

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simple pigmentation of *T1+2* and the somewhat longer ciliation of 3rd male antennal segment of *P. antennata*. On the contrary, there are many clear differences in the structure of the male and female terminalia (see key).

P. antennata had been long considered a synonym of *P. moesta* but it was reinstated as valid species on the basis of a lectotype designation by ROHÁČEK (1978c). Although the type material of *P. moesta* has not been traced, the solution of ROHÁČEK (1978c) is probably correct because VILLENEUVE (1918a) described *P. moesta* without pointing out the strikingly long pubescence of 3rd male antennal segment; nevertheless it is possible that VILLENEUVE's type series contained both discussed species, as was found with the types of *P. antennata* (see ROHÁČEK, 1978c).

Biology: The first reliable data based on revised material are given by ROHÁČEK (1978c). *P. antennata* is obviously a terricolous species and is probably phytosaprophagous. The species has been caught by soil traps, by sifting leaves and other vegetation in woods and meadows and in runs or nests of *Microtus arvalis* and *M. agrestis*, from lowland up to 1,900 m a. s. l. Adults were found in IV—XI, the peak occurrence may be in autumn (cf. ROHÁČEK, 1975a — as *Limosina moesta*). *P. antennata* occurs sometimes together with *P. moesta*, but it was found that in such cases one of them predominated. However, *P. antennata* seems to be generally rarer than *P. moesta*.

Distribution: The species is probably much more widely distributed than it is known up to the present. It was recorded from the following European countries: FRG (DUDA, 1918; ROHÁČEK, 1978c), Czechoslovakia (ROHÁČEK, 1975a, b, 1978c), Denmark, Finland, USSR: Ingria (material examined, new).

Pullimosina (Pullimosina) moesta (VILLENEUVE, 1918), **comb. nov.**

(Figs. 742—744, 757—769)

Limosina (*Leptocera*) *moesta* VILLENEUVE, 1918a: 337
Leptocera (*Scotophilella*) *moesta*: DUDA, 1925: 165 (key) (part.)
Leptocera (*Limosina*) *moesta*: RICHARDS, 1930: 298 (?part.)
Limosina (*Limosina*) *moesta*: DUDA, 1938: 133 (part.)
Leptocera moesta: NARTSHUK, 1970: 346 (key) (part.)
Limosina moesta: PAPP, 1973c: 40 (key) (?part.); ROHÁČEK, 1975b: 203 (part.); 1978c: 135
Limosina (*Scotophilella*) *antennata* DUDA, 1918: 190 (part.)
Leptocera antennata: SÉGUY, 1934: 464 (?part.).

Type material: Described by VILLENEUVE (1918a) from a series of specimens (♂ and ♀) from Rambouillet (France) and from 2 ♀ collected by KOWARZ near Franzensbad (= Františkovy Lázně, Czechoslovakia) and Dornbach (nr. Wien, Austria). The location of type series has not been discovered and is probably lost (not examined).

Material examined: 137 ♂ 155 ♀

Corsica: 1 ♀ (ZMB) — without locality (BECKER leg.).

Belgium: 1 ♂ (IRB) — Hoogstraeten (SEVERIN leg.).

FRG: 1 ♂ (ZMB) — Rheinland: St. Wendel (DUDA leg.).

Switzerland: 1 ♀ (CAF) — Vaud: Lausanne-Bellevaux (ARNAUD leg.).

Czechoslovakia: 129 ♂ 144 ♀ (JRO, PFB, SMO, MHK) — Bohemia: Choltice, Rečkov (MOCEK leg.) and localities given by ROHÁČEK (1978c); Moravia: Hněvošice, Úvalenské louky (distr. Opava) (ROHÁČEK leg.) and localities given by ROHÁČEK (1978c, 1980); Slovakia: see ROHÁČEK (1978c).

Denmark: 2 ♂ 3 ♀ (ZMK) — NEZ: Hillerød (LUNDBECK leg.), Bagsvaerd (LYNEBORG leg.).

Finland: 4 ♂ 6 ♀ (ZMH) — Al: Sund, Finnström (FREY leg.); Ab: Vichtis (FREY leg.); N: Esbo, Helsinge-Linna (FREY leg.), Helsinki (HACKMAN leg.); Ta: Kangasala (FREY leg.).

Description:

Male. Total body length 1.14—1.52 mm, general colour blackish brown, greyish brown dusted, subshiny. Head brownish black. Frons brownish black, sometimes with brown anterior margin; frontal triangle shining, orbits and interfrontalia somewhat silvery grey scarcely dusted, the rest of frons blackish brown dusted and dull. *pvt* very minute, almost indistinct. *occi* and *occe* relatively large. 3 *if*, the middle usually enlarged and often crossing; 3—5 minute *ads*. Frontal lunule, face and gena brown and dusted. *g* small. Facial cavity brown to brownish black, shining. Eye of normal size, its diameter about 3.3 times as long as the narrowest genal width. Antennae blackish brown, 3rd segment paler brown and long pilose though not as long as that of *P. antennata*. Arista about 3.8 times as long as antenna and relatively shortly ciliate.

Thorax blackish brown, brown dusted, subshiny and partly opalescent. 2 *hu*, the internal small; 2 *dc*, both situated postsuturally but in front or between them often 1 enlarged *dc* microseta. 6 rows of *ac* hairs, the medial prescutellar *ac* pair distinctly enlarged. Scutellum roundly shortly triangular, *sc* long. Pleurae with yellowish brown sutures between pleural sclerites; mesopleuron heavily dusted and duller, sternopleuron somewhat more shining. 2 *stpl*, the anterior very minute. Legs brown, with trochanters, knees and tarsi yellowish brown. t_2 chaetotaxy as in Fig. 744, *av* below middle absent, *va* short. Ratio $t_2 : mt_2 = 1.92—2.08$. Wing (Fig. 757) normal, with very pale brownish membrane, veins pale brown. *C* dark brown and far extended beyond R_{4+5}; latter bent up to *C* and ending farther from the apex of wing than unpigmented apical part of M_{1+2}. Discal cell short, with short but distinct and pigmented appendages of M_{1+2} and M_{3+4} beyond t_p. $t_a—t_p$ longer than t_p. Alula small, narrow, acute. Wing measurements: length 1.18—1.44 mm, width 0.51—0.63 mm, *C*-index = 0.85—1.08, $t_a—t_p : t_p = 1.50—2.16$. Halteres with yellowish stem and brown knob.

Abdomen blackish brown, grey or brown dusted, subshining, shortly haired. *T1+2* (Fig. 769) medially with pale, weakly sclerotized tongue-shaped area, similar to *P. pullula*. *S5* (Fig. 762) with unpigmented area in front of posterior margin, on each side of which protrudes a conical dark process surrounded by a cluster of very fine hairs.

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Genitalia. Periandrium (Figs. 760, 761) with a long dorsolateral hair, otherwise sparsely haired. Cerci each also with a single bristle. Hypandrium rod-like. Telomere (Fig. 759) differing from that of *P. antennata* by wholly rounded fore lower corner and large, backwardly protruding hind corner. Outer side densely long pale haired, similarly to *P. antennata*. Aedeagal complex (Fig. 758). Phallophore short, compact. Distiphallus complicated, with very finely tuberculate apex and small, slender, apically bifurcate projection dorsally subapically. Postgonite with wide proximal part and slender distal part, apex rather rounded, with 2 minute setulae. Ejaculatory apodeme not observed.

Female. Similar to male but differs as follows. Total body length 1.26–1.87 mm. t_2 chaetotaxy (Figs. 742, 743); all bristles on t_2 generally longer, especially *va* and *av* below middle present. Ratio $t_2 : mt_2 = 1.85–2.07$. Wing measurements: length 1.33–1.63 mm, width 0.57–0.73 mm, *C*-index = 0.83–1.18, $t_a – t_p : t_p = 1.70–2.36$.

Postabdomen (Figs. 763–765). *T8* laterally extended, quite similar to that of other species of the genus *Pullimosina*; its pigmentation as in Fig. 763. *T9* roundly triangular, with a pair of dorsal bristles. *S8* relatively small, transversely oval, with its anterior margin medially projecting forwards, below *S7*. *S9* small, transverse. In front of *S9* another small plate connected with spectacles-shaped sclerite. Spectacles-shaped sclerite more simply formed than that of *P. antennata* and somewhat weakly sclerotized and pigmented (Figs. 767, 768). Spermathecae (Fig. 766) of usual tyre-shaped form, with short sclerotized ducts and impressed terminal tips. Cerci short, each with a long sinuate apical hair and 2 shorter dorsolateral hairs.

Preimaginal stages: The puparium was described and illustrated by OKELY (1974: 50, Figs. 28–30). It resembles most that of *P. heteroneura*. However, it is not impossible that OKELY (1974) in fact described the puparium of *P. antennata*.

Discussion: *P. moesta* (VILLENEUVE) is very similar to the foregoing species and differs from it in the configuration of the male and female terminalia, by the pale pigmented medial area on *T1+2* and somewhat shorter ciliation of 3rd male antennal segment.

As already pointed out, it is very probable that not only DUDA (1918) but also VILLENEUVE (1918a) had a mixture of *P. moesta* and *P. antennata* in his type material. Unfortunately the types of *P. moesta* have not been found, and the interpretation of it is based merely on the fact that a single male identified by VILLENEUVE was examined and that this species is more common than *P. antennata* (see ROHÁČEK, 1978c).

Biology: ROHÁČEK (1978c) published the first critical data on the biology of *P. moesta* on the basis of revised material. The species is terricolous and presumably phytosaprophagous as is *P. antennata*. It was commonly found on decayed vegetation often in woods, sifted from moss and decayed grass, collected on garden compost heaps, rarely on decayed fungi and excrement of mammals or birds in woods. It was also frequently caught by soil traps (ROHÁČEK, 1978c, 1980) which demonstrates the terricolous life-habit of the species. *P. moesta* occurs sometimes in the same localities as *P. antennata*; the niche-preference of these ecologically rather similar species is hitherto unknown, but they surely differ because only one of them is common in the particular samples. Adults occur during the whole vegetation period, in III–XI.

Distribution: After the recent redefinition of this species its distribution is insufficiently known, but it seems to be widespread in Europe. Positively recorded from Corsica, Belgium, FRG (ROHÁČEK, 1978c), Switzerland (material examined, new), Czechoslovakia (ROHÁČEK, 1978c, 1980), Denmark and Finland (material examined, new). Numerous distributional records (see ROHÁČEK, 1978c) from previous literature are to be revised to discover if they are *P. moesta*.

Pullimosina (Pullimosina) pullula (ZETTERSTEDT, 1847), **comb. nov.**

(Figs. 28–31, 770–772, 776–788)

Limosina pullula ZETTERSTEDT, 1847: 2498; 1860: 6407; STENHAMMAR, 1854: 402; DAHL, 1909: 368; PAPP, 1973c: 41 (key); ROHÁČEK, 1975b: 198 (part.); PAPP, 1976a: 80; ROHÁČEK, 1978c: 139
Limosina (Scotophilella) pullula: DUDA, 1918: 185
Leptocera (Scotophilella) pullula: DUDA, 1925: 165 (key)
Leptocera (Limosina) pullula: RICHARDS, 1930: 298
Leptocera pullula: SÉGUY, 1934: 469; NARTSHUK, 1970: 346 (key)
Limosina (Limosina) pullula: DUDA, 1938: 141

Type material: Lectotype ♂ (des. by ROHÁČEK in 1977) labalded: "*L. pullula* ♂♀. Lund Paradisl. un.", "19." and with a small red rectangle. Specimen is headless, with detached abdomen and dissected genitalia (preserved in a microvial, pinned below specimen). Paralectotype ♀ without locality or determination label (shared with foregoing specimen), but with a small red rectangle as lectotype. Specimen is also headless (ZIL).

Material examined (besides "Type material"): 2 ♂ 294 ♀

Belgium: 1 ♀ (IRB) – Basse Wavre (LELEUP leg.).

GDR: 4 ♀ (ZMB) – Plagefenn (DAHL leg.), without locality (DUDA leg.).

Czechoslovakia: 267 ♀ (JRO, NMP, PFB, SMO, MHK) – Bohemia: Choltice, Uhersko (MOCEK leg.) and localities given by ROHÁČEK (1978c); Moravia: Mušov (POKORNÝ leg.), Hněvošice (distr. Opava), Vsetínské vrchy-Cáb Mt. (ROHÁČEK leg.) and localities given by ROHÁČEK (1978c, 1980); Slovakia: Tatranská Kotlina-Šarpanec (ROHÁČEK leg.) and localities given by ROHÁČEK (1978c).

Austria: 1 ♂ 1 ♀ (NMA) – Steiermark: Admont (STROBL leg.).

DOI: 10.21248/contrib.entomol.33.1.3-195

Hungary: 1 ♂ 2 ♀ (JRO) — Szaporca (BAJZA, PAPP leg.).
Finland: 19 ♀ (ZMH) — see ROHÁČEK (1978c).

Description:

Male. Total body length 1.11—1.23 mm, general colour brown to blackish brown, greyish brown pollinose, subshining. Head bicoloured. Frons brownish black, frontal triangle large, long and shining. Interfrontalia and orbits greyish silvery pollinose and somewhat glittering, only stripes between interfrontalia and orbits greyish black dusted and dull. *pvt* indistinct, *occi* robust, crossing. 3 *if*, the middle pair very long and crossing, the remaining small; 3—4 minute *ads*. Frontal lunule, face and anterior part of gena with vibrissal angle yellowish brown or yellow, and facial cavity yellow and shining. *g* small. Eye comparatively large, its diameter about 5.8 times as long as the smallest genal width. Antennae blackish brown, 3rd segment somewhat paler. Arista about 4.0 times as long as antenna, medium long ciliate.

Thorax brown to brownish black; mesonotum despite greyish brown pruinosity shining, pleurae duller. 2 *hu*, the internal small; 2 *dc* (postsuturally) but in front of them there may be 1—2 enlarged microsetae. 6 rows of *ac* microsetae, the medial prescutellar *ac* pair enlarged but usually shorter than anterior *dc*. Scutellum roundly triangular, *sc* long. Pleurae with yellow sutures between pleural sclerites. 2 *stpl*, the anterior reduced to a minute microseta. Legs pale yellowish brown, fore coxa, bases of femora, trochanters and often knees or partly tarsi yellow. t_2 chaetotaxy as in Fig. 772, *av* very minute or wholly indistinct. Ratio $t_2 : mt_2 = 1.78—1.92$. Wing (Fig. 776) normal, with distinctly yellowish brown membrane, veins brown, relatively dark. *C* very far produced beyond R_{4+5} being curved up to *C* and ending farther from the apex of wing than would have the non-developed apical part of M_{1+2}. Discal cell short; both appendages of M_{1+2} and M_{3+4} present, the latter is usually longer. Alula small, narrow, pointed. Wing measurements: length 1.06—1.17 mm, width 0.44—0.48 mm, *C*-index = 0.93—1.00, $t_a—t_p : t_p = 1.70—1.86$. Halteres yellowish brown, knob may be somewhat darker.

Abdomen despite some greyish brown pruinosity shining, dorsally sparsely haired. *T1+2* with a medial pale pigmented and weakly sclerotized triangular area (Fig. 785). *S5* (Fig. 788) with a typical row of strong but blunt spines in the middle of posterior margin.

Genitalia. Periandrium (Figs. 779, 780) rather long, sparsely haired, with a long dorsolateral hair, also cerci each with 1 long and some short bristles. Hypandrium of medium length, rod-like. Telomere (Fig. 778) with large, pointed hind corner; fore corner strongly rounded, hence telomere rather triangular. Outer side of telomere, particularly in proximal part, long pale haired. Aedeagal complex (Fig. 777). Phallophore solid, distiphallus with 2 apical processes. Postgonite short, distally tapering but apex cut out, not pointed. Some indistinct hairs on distal part of postgonite. Ejaculatory apodeme not found.

Female. Similar to male but differs as follows. Total body length 1.07—1.71 mm. Frons with very robust, horn-like middle pair of *if*. t_2 with distinctly developed *av* and longer *va* (Figs. 770, 771). Ratio $t_2 : mt_2 = 1.81—2.04$. Wing measurements: length 1.03—1.51 mm, width 0.43—0.63 mm, *C*-index = 0.86—1.02, $t_a—t_p : t_p = 1.45—2.10$. The anterior outer corner of discal cell is rather variable (rectangular to widely obtuse-angled).

Postabdomen (Figs. 782—784). In addition to *T8*, *T7* also transversely widened, reaching far on lateral side. *T8* pigmented as in Fig. 782. *T9* short, more strongly pigmented at basal margin, dorsally with a pair of short setae. *S8* relatively long, more narrow at posterior margin. *S9* short, sickle-shaped, with a pair of small hairs. In front of *S9* a small triangular plate connected with spectacles-shaped sclerite. Spectacles-shaped sclerite (Figs. 786, 787) relatively compact, its form wholly different from that of *P. meijerei*. Spermathecae (Fig. 781) rather disc-shaped, thus more flattened than those of other *Pullimosina*. Cerci short, each with a longer apical and shorter dorsopreapical and ventropreapical hair.

Preimaginal stages: OKELY (1974: 51, Fig. 31) described and illustrated the puparium. It resembles that of *P. moesta* or *P. heteroneura* but is (when hatched) white and translucent. Some features of the puparium are in Figs. 28—31.

Discussion: *P. pullula* (ZETTERSTEDT) is the closest relative of *P. meijerei* (DUDA) and differs from it in its pale pigmented mediobasal area on *T1+2* and mainly in the formation of the male genitalia (telomere, postgonite, anal opening of periandrium), male *S5* and female postabdomen (*T7*, *T8*, *S8*, spectacles-shaped sclerite). The wing polymorphism of this species (see PAPP, 1976a) has not been confirmed; probably all brachypterous specimens of PAPP (1976a) belong to *P. meijerei* (DUDA).

The incorrect synonymy of *P. meijerei* with *P. pullula* by ROHÁČEK (1975b) was discovered by PAPP (1976a) who first correctly recognized these two species (see also ROHÁČEK, 1978c).

Biology: A terricolous and predominantly phytosaprophagous species (breeding record — OKELY, 1974) living in decayed vegetable matter in wet meadows, fields and woods. It seems to prefer various grassy ecosystems and is more common in low than in higher altitudes (ROHÁČEK, 1978c, 1980). The common occurrence of *P. pullula* and *P. meijerei* in intermediate altitudes (round 300—500 m) is not very unusual but in that case only one of them predominates. *P. pullula* does not live only in detritus and decaying herbaceous material but was found also in burrows of various small mammals (RICHARDS, 1930; SÉGUY, 1934; HACKMAN, 1963b — breeding record from excrement of voles), and even accidentally on horse droppings (RICHARDS, 1930). It was caught in numbers by the soil trap method in lowland areas (ROHÁČEK, 1975a; PAPP, 1976a).

Adults occur during the whole vegetative period (II—XII), the peak occurrence may be in spring and autumn (ROHÁČEK, 1975a) but the species is apparently polyvoltine (see Part I). The males of *P. pullula* are very rare and do not occur in all the populations. The majority of populations are apparently parthenogenetic (see ROHÁČEK, 1978c) while the bisexual populations are probably retreating. OKELY (1974) as the first demonstrated the parthenogenetical reproduction of *P. pullula* by repeated breeding experiments. Under laboratory conditions, the virgin females (F_1 generation bred from eggs laid by wild females) began egg-laying on the 4th day after emergence and each laid up to 80 eggs during a 20-day period. Up to 90% of the eggs developed. Larvae pupated about 12 days after

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the eggs were laid; the pupal stage lasted 4—12 days and the whole life-history 22—36 days (OKELY, 1974).

Distribution: Widespread throughout Europe. Recorded from Spain (HACKMAN, 1969b), France (SÉGUY, 1934), GB: England (RICHARDS, 1930; OKELY, 1974), Belgium (ROHÁČEK, 1978c), FRG (DUDA, 1918), GDR (DAHL, 1909; DUDA, 1918; BÄHRMANN, 1976), Poland (DUDA, 1918), Czechoslovakia (summarized records — ROHÁČEK, 1978c), Austria (DUDA, 1918), Hungary (DUDA, 1918; MIHÁLYI, 1967; PAPP, 1973c, 1976a), Norway (DUDA, 1918), Sweden (ZETTERSTEDT, 1847, 1860; STENHAMMAR, 1854), Finland (FREY, 1941; HACKMAN, 1963b; ROHÁČEK, 1978c), USSR: Estonia (HACKMAN, 1972; PAPP, 1979a). VANSCHUYTBROECK's (1962a) record from Central Africa (Tanganyika) is improbable (see ROHÁČEK, 1978c).

Pullimosina (Pullimosina) meijerei (DUDA, 1918), **comb. nov.**

(Figs. 723, 773—775, 789—802)

Limosina (*Scotophilella*) *Meijerei* DUDA, 1918: 235
Leptocera (*Scotophilella*) *Meijerei*: DUDA, 1925: 161 (key)
Leptocera (*Limosina*) *meijerei*: RICHARDS, 1930: 299
Limosina (*Limosina*) *Meijerei*: DUDA, 1938: 132
Leptocera meijerei: NARTSHUK, 1970: 346 (key)
Limosina Meijerei: PAPP, 1973c: 50 (key)
Limosina meijerei: ROHÁČEK, 1978c: 143
Limosina pullula: ROHÁČEK, 1975b: 198 (part.)

Type material: Holotype ♀ labelled: "v. HAGE EVERTS" and "*Scotophilella Meijerei* DUDA" (DUDA's handwriting). Both wings of the specimen are missing. According to the original description (DUDA, 1918) it is a brachypterous form (ZMB, examined).

Material examined (besides "Type material"): 78 ♂ 94 ♀ f. macropt., 99 ♂ 146 ♀ f. brach.

Denmark: 1 ♂ f. brach. (ZMK) — NEZ: Ermelund (LUNDBECK leg.).

Czechoslovakia: 78 ♂ 93 ♀ f. macropt., 98 ♂ 146 ♀ f. brach. (JRO, PFB, SMO, MHK) — Bohemia: Choltice (MOCEK leg.) and localities given by ROHÁČEK (1978c); Moravia: H. Jeseník Mts.-Skřítek, Hradec n. M. (ROHÁČEK leg.) and localities given by ROHÁČEK (1978c, 1980); Slovakia: Turček env. (ROHÁČEK leg.), Branisko (BENEŠ leg.) and localities given by ROHÁČEK (1978c).

Austria: 1 ♀ f. macropt. (IZI) — Tyrol: Hohe Tauern-Badgastein (TROGER leg.).

Description:

Male. Total body length 1.22—1.64 mm, general colour blackish brown, brownish grey dusted, subshiny. Head bicolorous. Frons blackish, its anterior margin often brown, sparsely greyish brown dusted and rather shiny, frontal triangle indistinctly delimited, orbits and interfrontalia somewhat more greyish pollinose. *pvt* not found. 3 *if*, the middle longer than other, but not as long as in *P. pullula* and usually not crossing. 2—4 very minute *ads*. Frontal lunule, facial cavity and vibrissal angle yellow, facial cavity shining. Face and anterior part of gena yellowish brown, posterior part of gena brown. *g* very small, shorter than peristomal hairs. Eye large, convex, its diameter about 6.1 times the narrowest genal width. Antennae blackish brown, 3rd segment paler and longer ciliate than arista. Arista about 4.3 times as long as antenna, medium or rather shortly ciliate.

Thorax blackish brown, greyish brown dusted; mesonotum subshiny, pleurae duller. 2 *hu*, the internal small. 2 *dc*, sometimes also 1 enlarged *dc* microseta between or in front of them. 6 rows of *ac* hairs, the medial prescutellar *ac* pair enlarged. Scutellum somewhat shorter than that of *P. pullula*, roundly shortly triangular, *sc* long. Pleurae with yellowish brown sutures between sclerites; 2 *stpl*, the anterior reduced to a microseta. Legs yellow to yellowish brown, fore coxa and trochanters very pale yellow, hind femur usually darkened, brown. t_2 chaetotaxy (Fig. 775); *av* below middle small but distinct, *va* short. Ratio t_2: mt_2 = 1.87—2.07. Wings polymorphic (Figs. 789—791), with yellowish brown fumose membrane and brown veins. Macropterous form: wing of normal length, similar to that of *P. pullula* (Fig. 789). *C* extended far beyond R_{4+5}, the latter curved up to *C* and ending much farther from apex of wing than the apical unpigmented part of M_{1+2}. Discal cell with t_a—t_p longer than t_p and with distinct appendages of M_{1+2} and M_{3+4}. Alula small, narrow, pointed. Wing measurements: length 1.18—1.39 mm, width 0.48—0.65 mm, *C*-index = 0.84—1.00, t_a—t_p : t_p = 1.50—2.20. Brachypterous form: wing distinctly abbreviated and somewhat narrowed (Figs. 790, 791), shorter than abdomen. *C* less extended beyond R_{4+5}, the latter straighter and ending nearer the apex of wing. Discal cell shorter, narrower, t_a—t_p usually shorter than t_p. Appendages of M_{1+2} and M_{3+4} beyond t_p often reduced and outer corners rounded. Some parts of venation (e.g. t_p, part of M_{3+4} or of apical section of R_{4+5}) sometimes absent in relatively frequent mutant specimens. Wing measurements: length 0.73—1.04 mm, width 0.25—0.36 mm, *C*-index = 0.65—0.95, t_a—t_p: t_p (only approximately measurable owing to rounded outer corners of discal cell) = 0.50—1.00. Halteres yellow with brownish knob, in f. brach. strongly reduced, especially the knob.

Abdomen black, brown pruinose and shining. *T1+2* simple, sclerotized and darkly pigmented. Terga sparsely and shortly, sterna only a little more densely haired. *S5* (Fig. 802) with a crown of strong, shortly conical, thorn-like spines and with a deep medial incision on posterior margin.

Genitalia. Periandrium (Figs. 794, 795) large, with a long dorsolateral hair, also cerci each with 1 longer bristle, otherwise shortly and sparsely haired. Anal opening small compared with that of *P. pullula*. Hypandrium rod-like. Telomere (Fig. 793) square-shaped, outside long and pale wavy haired, with a slender and pointed anterior corner and somewhat blunter posterior corner. Aedeagal complex (Fig. 792) with solid phallophore and large distiphallus, medially protruding in a paired projection; each of its lateral lobes armed by an external group of spines and one apical spine. Postgonite short, proximally broad, apically narrow, with rounded apex bearing some small setulae. Ejaculatory apodeme probably absent, not found.

Female. Similar to male except for differences mentioned below. Total body length 1.18—1.71 mm. t_2 with distinct but short *av*; *va* longer than in male (Figs. 773, 774). Ratio t_2: mt_2 = 1.92—2.04. Wing measurements of f. macropt.: length 1.11—1.45 mm, width 0.47—0.63 mm, *C*-index = 0.78—1.02, t_a—t_p: t_p = 1.73—2.40. Wing measurements of f. brach.: length 0.77—1.12 mm, width 0.28—0.40 mm, *C*-index = 0.67—1.00, t_a—t_p : t_p = 0.50—1.17.

Postabdomen (Figs. 796—798). *T7* very short and wide (as *T8*), medially with a narrow incision on posterior margin. *T8* large, medially with dark and heavily sclerotized tubercle. *T9* small, transverse, with a pair of small dorsal setae. *S8*

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transversely oval, with a small posteromedial incision and darker pigmented medial part. *S9* very short, stripe-shaped; in front of it a further small plate connected with spectacles-shaped sclerite which is very robust (Figs. 800–881). Spermathecae (Fig. 799) rather intermediate between disc-shaped and tyre-shaped, with impressed terminal tips. Cerci small, with a longer apical and 3 shorter preapical hairs.

Discussion: The species is closest to *P. pullula* (ZETTERSTEDT) and differs from it in having a somewhat larger head, shorter middle pair of *if*, simple dark pigmented *T1+2*, differently formed and armed male *S5*, genitalia (telomere, anal opening, aedeagal complex) and female postabdomen (*T7*, *T8*, *S8*, spectacles-shaped sclerite, spermathecae).

As mentioned above, ROHÁČEK (1975b) not knowing the male of the true *P. pullula*, wrongly synonymized *P. meijerei* (DUDA) as only brachypterous form of *P. pullula*; PAPP (1976a) first recognized both species correctly and ROHÁČEK (1978c) confirmed their validity by examination of the type material.

Biology: *P. meijerei* is a typical terricolous and obviously phytosaprophagous species, chiefly occurring in deeper layers of leaf litter in deciduous forests (ROHÁČEK, 1975b, 1978c), more rarely also in moss and decayed grass in woodland meadows and in burrows of small mammals (RICHARDS, 1930; PAPP, 1973c, 1974a, 1976a). The species has been considered rare but it is common, especially in submountaine woodland areas of Central Europe, and is easily obtainable by sifting or the soil trap method (ROHÁČEK, 1978c, 1980). It has both a macropterous and a brachypterous form (this phenomenon was wrongly attributed to *P. pullula* by ROHÁČEK, 1975b) of which the brachypterous form predominates in the majority of populations (ROHÁČEK, 1978c, 1980). Adults were collected in III–XI.

Distribution: A Central European species recorded from GB: England (RICHARDS, 1930), Holland (DUDA, 1918), GDR (MOHRIG, 1967), Denmark (material examined, new), Czechoslovakia (ROHÁČEK, 1975a, b, 1978c, 1980), Austria (FRANZ, 1952) and Hungary (PAPP, 1973c, 1974a, 1976a).

11. Genus *Spinilimosina* gen. nov.

Type species: *Limosina brevicostata* DUDA, 1918

Diagnosis: The genus can be defined by the following features.

(1) *pvt* well developed; in front of them an additional pair of smaller false *pvt*
(2) 4–5 *if* of about equal length
(3) *ads* forming a long row running on anterior part of orbits, through face and anterior part of gena
(4) *g* of medium length
(5) 2 *hu*, the internal small
(6) 1 *dc* in prescutellar position
(7) 8–10 rows of *ac* microsetae in front of suture
(8) 2 *stpl*, both weak, the posterior longer
(9) scutellum large, roundly elongate triangular
(10) t_2 chaetotaxy (Figs. 804–806), ventrally with *av* below middle of t_2 in both sexes
(11) *C* not overpassing R_{4+5}
(12) R_{4+5} strongly curved up to *C*
(13) discal cell short, outer corners never rounded, with short pigmented processes of M_{1+2} and M_{3+4} beyond t_p
(14) alula small, narrow
(15) female postabdomen short, not telescopic, but narrower than preabdomen
(16) male *S5* with posteromedial comb of blunt dense spines
(17) periandrium with robust, spine-like bristles (1 dorsolateral, 2–3 laterocaudals)
(18) male cerci distinct, each with single bristle
(19) hypandrium comparatively short, slender
(20) telomere of complex form (external and internal lobe)
(21) phallophore compact, somewhat projecting ventrally
(22) distiphallus large, of complex form, with robust dorsal projections and finely spinulate apex

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(23) postgonite large, broad, apically pointed, spinulate and carrying some 2 setulae
(24) ejaculatory apodeme not discovered
(25) female *T6* and *T7* simple
(26) female *T8* simply pigmented but long and laterally extended
(27) female *T9* short, obtriangular (tapering anteriorly), with 2 dorsal setae and 2 minute hairs
(28) female *S6* and *S7* simple transversely oblong
(29) female *S8* of complex form, with medial flat projection and 2 short lateral projections
(30) behind *S8* a small additional sclerite, connected with internal spectacles-shaped sclerite
(31) female *S9* medium-sized, with 3 anterior incisions
(32) spermathecae roughly dish-shaped, with internal protrusible sac as in *Spelobia*
(33) female cerci very short, conically tapering, each with 2 sinuate and 1 curved hair.

Discussion: The genus *Spinilimosina* gen. nov. belongs to the aberrant members of the *Spelobia* genera-group. Its closest relative seems to be the well known genus *Chaetopodella* DUDA. Both these genera have a number of characters in common — very similar head chaetotaxy, bilobed (external and internal lobe) telomere, similar structure of aedeagal complex (complicated distiphallus and ventrally projecting phallophore), well developed additional sclerite behind female *S8* etc. However, *Spinilimosina* differs by some autapomorphic features (strongly upcurved R_{4+5}, very thick bristles on periandrium, male *S5* with posterior comb of spines, female *S8*, *T9*, spermathecae) and by lacking the velvety black markings on mesonotum (at least on scutellum) and the *av* on mt_2 of *Chaetopodella*. Both the above mentioned genera are placed as sister-groups in the cladogram (Fig. 64) showing the interrelationships within the *Spelobia* genera-group, but this solution should be considered only provisional and will be probably changed in the future, when the tropical groups of the previous genus *Limosina* are better known.

Spinilimosina gen. nov. includes only species in the Palaearctic Region, *S. brevicostata* (DUDA, 1918). *S. rufifrons* (DUDA, 1925) stat. nov., comb. nov. is a valid species (known from Central and East Africa, India, Formosa, New Guinea, Hawaii, Bonin Is., Malaya — see RICHARDS, 1973) belonging to this genus. *S. pectinata* (TENORIO, 1968) comb. nov. from Hawaii seems to be very close (if not identical) to *S. brevicostata*.

Spinilimosina brevicostata (DUDA, 1918), comb. nov.

(Figs. 803–818)

Limosina (*Scotophilella*) *brevicostata* DUDA, 1918: 183
Leptocera (*Scotophilella*) *brevicostata*: DUDA, 1925: 164 (key)
Limosina (*Limosina*) *brevicostata*: DUDA, 1938: 112
Limosina brevicostata: COLLIN, 1956: 174; PAPP, 1973c: 40 (key)
Leptocera brevicostata: NARTSHUK, 1970: 348 (key)

Type material: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "Ilfeld S.-Harz DUDA", "4 6 F", "*brevicostata* D. ♂ d. DUDA" and "Typus" (red label); paralectotypes: 1 ♀ with same data but with "8 8 F" and "*brevicostata* D. ♀ d. DUDA" labels; 1 ♀ labelled: "Herten Westf. DUDA", "31 7 F", "photo" and "*brevicostata* D. ♀ d. DUDA"; 1 ♂ labelled: "Südspanien Prof. G. STROBL 52 133 nicht *minutissima*" and "*brevicostata* ♂ det. DUDA" (rather damaged specimen); 1 ♀ labelled: "Kairo XI 44372" and "*brevicostata* det. DUDA" (all in ZMB).

Material examined (besides "Type material"): 4 ♂ 5 ♀

Canary Islands: 1 ♂ 3 ♀ (ZMH) — Gomera: Cumbre, Hormigua (FREY leg.); Tenerife: Orotava (FREY leg.); Gr. Canaria: Tafira (FREY leg.).
Azores: 1 ♂ (ZMH) — S. Miguel-Furnas (FREY leg.).
Madeira: 1 ♀ (ZMH) — Ribeira Brava (FREY leg.).
Spain: 1 ♂ 1 ♀ (JRO) — Tortosa env. (ROHÁČEK leg.).
Finland: 1 ♂ (ZMH) — Ta: Messuby (FREY leg.).

Description:
Male. Total body length 1.20–1.36 mm, general colour dark brown, sparsely brown dusted and relatively shiny. Head (Fig. 803) rather short and high, brown. Frons blackish brown, with broad reddish or yellowish brown anterior margin, shiny, only narrow interfrontalia, ocellar triangle and orbits sparsely greyish pollinose. 4–5 *if* of equal length; a long row of small *ads* beginning inside lower *ors* and extending round the eye through face to anterior third of gena; convergent *pvt* in 2 pairs (the anterior pair are "false" *pvt*). Frontal lunule, face and gena pale brown and somewhat pollinose, gena with larger triangular shiny spot below eye. Facial cavity darker brown and shiny. Eye comparatively small, its diameter about 1.9–2.1 times the narrowest genal width. *g* distinctly developed. Antennae with reddish brown 2 basal segments; 3rd segment black and shortly whitish pilose. Arista about 3.8 times as long as antenna, medium long ciliate.

Thorax dark brown, greyish brown pollinose, mesonotum more shining, pleurae duller. 2 usual *hu* (the internal small) and 1 small external setula in addition on humeral callus. Mesonotal chaetotaxy: 1 *dc* in prescutellar position, 8–10 rows of *ac* microsetae, the medial prescutellar *ac* pair enlarged. 2 weak *stpl*, the posterior a little longer than the anterior. Sternopleuron anteriorly more shining. Scutellum relatively large, long; *sc* long. Legs brown, trochanters, coxae, knees and tarsi somewhat paler. Fore tarsus with somewhat dilated terminal segments. t_2 chaetotaxy as in Fig. 806, thus ventrally with *av* in half of t_2. Ratio t_2: mt_2 = 1.85–1.92. Wing (Fig. 807) with pale, almost hyaline membrane and pale brown veins (*C* dark

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brown). *C* not extending beyond R_{4+5}. R_{4+5} strongly curved up to *C* and ending much farther from the apex of wing than would have M_{1+2}. Discal cell short, its anterior outer corner usually obtuse-angled. Both pigmented appendages of M_{1+2} and M_{3+4} developed, the posterior usually longer. Alula small, narrow, acute. Wing measurements: length 1.18—1.27 mm, width 0.49—0.58 mm, *C*-index = 1.02—1.26, $t_a - t_p : t_p = 1.60 - 2.13$. Halteres yellow, knob darker, greyish.

Abdomen brownish black, greyish brown pruinose, very little shining. Terga sparsely, sterna more densely haired. *T1+2* basally medially with desclerotized area (Fig. 815), in dry specimens visible as flat impression. *S5* (Fig. 812) with large, semicircular, membraneous, finely pubescent medial area at posterior margin, in front of a long comb of blunt spines.

Genitalia. Periandrium (Figs. 810, 811) rather short, with the exception of some extremely robust spine-like bristles (1 dorsolateral, 2—3 laterocaudals) very sparsely haired. Cerci well developed, each with one longer bristle. Hypandrium comparatively small. Telomere (Fig. 809) of complex form, with larger external lobe carrying 2 wing-shaped processes and smaller internal lobe bearing a robust ventrally directed spine. Aedeagal complex (Fig. 808) large; phallophore compact, projecting a little ventrally. Distiphallus large, its membraneous apical part finely spinulate, dorsally with a robust and heavily sclerotized forked sclerite. Postgonite large, broad, pointed, apically with 2 setulae and finely spinulate. Ejaculatory apodeme not observed.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.41 to 1.61 mm. t_2 chaetotaxy as in male (Figs. 804, 805). Ratio $t_2 : mt_2 = 1.74 - 1.87$. Wing measurements: length 1.39—1.48 mm, width 0.60—0.67 mm, *C*-index = 1.04—1.18, $t_a - t_p : t_p = 1.75 - 2.30$.

Postabdomen (Figs. 816, 817) narrower than preabdomen but short and not distinctly telescopic. *T8* simply pigmented, relatively long and laterally extended. *T9* characteristically obtriangular, i.e. posteriorly wide, with 2 long dorsal setae and 2 minute setulae. *S7* simple, transversely oblong. *S8* of complex form, posteriorly with 2 lateral short processes and one long medial flat projection. The latter is apically extended and bent at right angles to ventral surface of abdomen. Behind it and more internally there is an additional small sclerite, connected also with the spectacles-shaped sclerite. Spectacles-shaped sclerite (Fig. 814) with membraneous basal anterior part and distinctly developed rings, each with a slender posterior process. *S9* also very peculiar, with 3 (2 lateral and 1 medial) anterior incisions and some setulae on posterior margin. Spermathecae (Figs. 813, 818) dish-shaped, with protrusible internal membraneous sac as in *Spelobia* and related genera; sclerotized parts of ducts short. Cerci very short, conical, each with 2 sinuate and 1 curved hair.

Discussion: The species is easily recognizable by its abbreviated *C* and R_{4+5} strongly curved up to *C*. In comparison with *Pullimosina* species, the *C* is not extended beyond R_{4+5}. The periandrium with very robust bristles, bilobed telomere with densely haired external lobe, large distiphallus with double dorsal projection and very peculiar female *T9*, *S8* and *S9* are also characteristic.

The identity of *S. brevicostata* has been verified by examination of the type material. Hitherto no related species is known from Europe.

Biology: A very little known species. Adults were collected on window (DUDA, 1918, 1938), by means of faeces trap (MIHÁLYI, 1967), on compost heap (COLLIN, 1956) and bred from horse dung (PAPP, 1974c). I have collected it under decayed vegetation on a refuse heap. Adults occur during V—XI (PAPP, 1973c).

Distribution: Widespread in tropics and subtropics of Old World, only rarely penetrating to Central Europe and occassionally even southern parts of North Europe. In Europe it was recorded from Spain (DUDA, 1918; HACKMAN, 1969b), GB: England (COLLIN, 1956; RICHARDS, 1976), FRG, GDR (DUDA, 1918), Hungary (MIHÁLYI, 1967; PAPP, 1973c, 1974c), Jugoslavia (DUDA, 1918) and Finland (material examined, new, the northernmost finding). Extra-European records are from Canary Is. (FREY, 1936), Madeira (DUDA, 1918; HACKMAN, 1960), Azores (material examined, new), Tunisia (DUDA, 1918; PAPP, 1977b), Egypt (DUDA, 1918), Palestine (DUDA, 1938), Ethiopia (DUDA, 1918, 1925), Central Africa (VANSCHUYTBROECK, 1950b, 1951, 1970), South Africa (HACKMAN, 1965a), Madagascar (HACKMAN, 1967b), Caucasus (DUDA, 1918), Afghanistan (PAPP, 1978a), Nepal (DEEMING, 1969).

12. Genus *Chaetopodella* DUDA, 1920

Chaetopodella DUDA, 1920: 435 (as subgen.); DUDA, 1925:.144 (as subgen.); RICHARDS, 1930: 290 (as subgen.); DUDA, 1938: 95 (as subgen.); PAPP, 1973c: 62.
Type species: *Limosina scutellaris* HALIDAY, 1836 (orig. des.)

Gyretria ENDERLEIN, 1938: 652.
Type species: *Gyretria binodatipes* ENDERLEIN, 1938 = *Limosina melanogaster* THOMSON, 1869 (orig. des.) (fide RICHARDS, 1967).

Diagnosis: The genus can be defined as follows.
(1) *pvt* well developed; in front of them an additional pair of smaller false *pvt*
(2) 2—4 *if* of about equal length
(3) 6—10 (or even more ?) minute *ads*

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(4) *g* small, hardly longer than setulae posterior to it
(5) 2 *hu*, also internal rather long
(6) 3—4 (5) *dc*, the anterior (in front of suture) short
(7) 6—8 rows of *ac* microsetae, the medial prescutellar *ac* pair enlarged
(8) 2 *stpl*, the anterior small but distinct
(9) scutellum elongate triangular, always heavily velvety black dusted, also other parts of mesonotum and abdomen may be similarly marked in some species
(10) t_2 chaetotaxy rich (Figs. 819—821); *av* below half of t_2 present only in female
(11) mt_2 with characteristic *va* bristle (Fig. 820)
(12) *C* not overpassing R_{4+5}
(13) R_{4+5} slightly curved up to *C*
(14) discal cell comparatively long, narrow, its outer corners never rounded
(15) alula large, broad
(16) female postabdomen short, broad, basally not essentially narrower than preabdomen
(17) male *S5* without posteromedial comb of spines, but with 2 longer posterior projections (? always)
(18) periandrium with a long dorsolateral, laterocaudal and caudal bristle
(19) male cerci fused with periandrium
(20) hypandrium comparatively large
(21) telomere of complex form (with external and internal lobe)
(22) phallophore compact, distinctly projecting ventrally almost forming the epiphallus
(23) distiphallus large, of very complex form
(24) postgonite relatively short, externally with some setulae and fine pubescence
(25) ejaculatory apodeme not found
(26) female *T6* and *T7* simple
(27) female *T8* divided into 2 lateral plates
(28) female *T9* short, with a pair of dorsal setulae
(29) female *S6* and *S7* simple
(30) female *S8* short, transverse
(31) between *S8* and *S9* (exactly connected with *S9*) a distinct additional sclerite anteriorly connected with spectacles-shaped sclerite
(32) female *S9* medium-sized, finely setose
(33) spermathecae vesiculate, hemispherical to globular (? always)
(34) cerci very short, each with 1 longer sinuate apical hair, other hairs short.

Discussion: This very distinctive genus, characterized by some clearly autapomorphic features (velvety black markings at least on scutellum, *av* bristle on mt_2, ventrally projecting phallophore) was found to belong to the *Spelobia* genera-group, close allied to the genus *Spinilimosina* gen. nov. It resembles other genera of the above group in having a similar head and t_2 chaetotaxy, wing venation, structure of the female postabdomen including the well developed spectacles-shaped sclerite, formation of periandrium etc. *Spinilimosina* gen. nov. shares with *Chaetopodella* Duda the bilobed telomere with external and internal lobes, similar formation of aedeagal complex and an additional sclerite between female *S8* and *S9*. Therefore, they are provisionally placed as sister-groups in the suggested cladogram of *Spelobia* genera-group (see chapter "Phylogeny", Fig. 64). The cladogenesis of these genera will be probably more complicated owing to existence of further (undescribed) related groups from tropics — both the above discussed genera are obviously of extra-Palaearctic origin.

The genus has been erected as a monotypic subgenus of *Limosina* Macquart for *Limosina scutellaris* Haliday by Duda (1920). Duda (1925) described the genus more thoroughly and included 6 species. However, one of them, *Leptocera* (*Ch.*) *biseta* Duda, 1925, has only 1 *ors* and therefore Duda (1938) placed it in a new genus *Alima*. Richards (1967) synonymized *Alima* Duda, 1938, with *Chaetopodella* and moreover found it to be preoccupied by *Alima* Grube, 1855. I consider the lack of one *ors* to be an important feature and maybe a good reason for the separation of *Leptocera* (*Ch.*) *biseta* Duda into a different genus, but an exact study of its genitalia is necessary to demonstrate this. For the time being, I do not therefore include it in *Chaetopodella* Duda. The genus *Gyretria* Enderlein,

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1938, is synonymous with *Chaetopodella* as its type species, *G. binodatipes* ENDERLEIN is synonymous with *Ch. melanogaster* (THOMSON, 1869) (see RICHARDS, 1967).

The genus *Chaetopodella* includes only the type species — *Ch. scutellaris* (HALIDAY, 1836) in the Palaearctic Region. Other species included: *Ch. denigrata* (DUDA, 1925) (East Africa), *Ch. congoensis* (VANSCHUYTBROECK, 1950) (Zaire), *Ch. lesnei* (SÉGUY, 1933) (Zambesi), *Ch. cursoni* (RICHARDS, 1939) (South Africa), *Ch. albocincta* (RICHARDS, 1964) (Solomon Is., New Hebrides), *Ch. melanogaster* (THOMSON, 1869) (South America), *Ch. rectangularis* (MALLOCH, 1914) (Costa Rica), *Ch. tonsa* (DUDA, 1925) (Costa Rica).

Chaetopodella scutellaris (HALIDAY, 1836)

(Figs. 8–15, 34, 819–833)

Limosina scutellaris HALIDAY, 1836: 329; STENHAMMAR, 1854: 407; ZETTERSTEDT, 1860: 6407; RONDANI, 1880: 34; DAHL, 1909: 374
Limosina (Scotophilella) scutellaris: DUDA, 1918: 181
Leptocera (Chaetopodella) scutellaris: DUDA, 1925: 145 (key); RICHARDS, 1930: 290
Leptocera scutellaris: SÉGUY, 1934: 470; NARTSHUK, 1970: 344 (key)
Limosina (Chaetopodella) scutellaris: DUDA, 1938: 95
Chaetopodella scutellaris: PAPP, 1973c: 63 (key)
Limosina flavofasciata STENHAMMAR, 1854: 407 (nom. nud.)

Type material: 4 syntypic specimens are deposited in NMI (Dr. J. P. O'CONNOR, letter communication, 1979); one of them might be designated as lectotype if necessary (not examined).

Material examined: 243 ♂ 380 ♀

Denmark: 4 ♂ 8 ♀ (ZMK) — SJ: Sønderborg (WÜSTNEI leg.); F: Arreskov sø (KRISTENSEN leg.); NEZ: Ruderhegn (JACOBSEN leg.), Utterslev Mose (SCHLICK leg.).

Czechoslovakia: 236 ♂ 368 ♀ (JRO, JZP, NMP, SMO) — Bohemia: Cheb (ZUSKA leg.), Kynšperk n. O. (KOVÁŘ leg.), Louny (ROHÁČEK leg.); Moravia: Třešť, Mor. Kras-Babice, Adamov, H. Jeseník Mts.- Skřítek, Rejvíz, Jezerná, Kepřník Mt., Hnčvošice (distr. Opava), Úvalno, Klokočov (distr. Opava) (ROHÁČEK leg.), Milotice n. O. (ZUSKA leg.); Slovakia: Patince nr. Komárno, Turček, Terchová, Lubochňa, V. Fatra Mts.-Rakytov, Šiprúň, N. Tatry Mts.-V. Boca, Demänovská dolina, Slov. Raj-Lipovec, V. Sokol, Slov. Kras-Zadiel, Turňa n. B., Silická planina, Plešivecká planina, Kečovo, Belanské Tatry Mts.-Šarpanec, Tatranská Kotlina, Vihorlat Mts.-R. Hámre, Stakčín nr. Snina (ROHÁČEK leg.), Král. Chlmec (ZUSKA leg.).

Bulgaria: 3 ♂ 5 ♀ (IZS) — Plana, Tcherni Osam-Trojnska, Bistritza, Losenska Mt., Novo sela, Smoljan, Belogradtzik (BESHOVSKI leg.).

Description:

Male. Total body length 1.43–1.85 mm, general colour brownish black, greyish brown dusted but rather shiny. Head partly yellow, partly blackish brown. Frons with broad yellow anterior margin, otherwise blackish brown as is occiput. Frontal and ocellar triangle, interfrontalia and orbits silvery grey dusted and shining, only the narrow stripes between the above parts blackish dusted and dull. 2 pairs of convergent *pvt* (as in *Spinilimosina*) developed (Fig. 34); 7–9 small *ads* present. 3 *if*, all of about equal length (the anterior may be sometimes longer). Frontal lunule, face, facial cavity and gena yellow or orange. *g* small, hardly longer than the setae behind it. Eye large, its largest diameter about 4.9 times as long as the narrowest genal width. Antennae brownish black, except for the yellow basal segment. Arista about 3.4 times as long as antenna and shortly ciliate.

Thorax brownish black, greyish brown pollinose. Mesonotum rather shining, pleurae duller. Scutellum densely velvety black dusted, dull, only the small spots round the bases of *sc* silvery glittering. 2 *hu*, both well developed, but the external longer. 3 postsutural *dc*, sometimes also 2 presutural microsetae enlarged. 8 regular rows of *ac* hairs in front of suture, the medial prescutellar *ac* pair distinctly enlarged. Pleurae greyish brown dusted, rather dull. 2 *stpl*, both rather long (the posterior twice the length of the anterior) but thin. Scutellum elongate triangular, *sc* long. Legs yellowish brown, fore coxa, trochanters, knees and tarsi yellow. Mid trochanter with small upcurving bristle. t_2 chaetotaxy (Fig. 821) rich but generally similar to some species of *Spelobia* and *Spinilimosina* but *av* in lower half of t_2 absent. mt_2 with characteristic *av* bristle in half its length (Fig. 820). Ratio $t_2 : mt_2 = 1.64–1.74$. Wing (Fig. 822) with whitish to very pale yellowish brown membrane, also veins pale yellowish brown, *C* somewhat darker and not extended beyond R_{4+5}; R_{4+5} slightly bent up to *C*. Discal cell long and narrow. Both its outer corners with short venal processes of M_{1+2} and M_{3+4}, the first being continued by colourless venal fold. Alula broad, frounded. Wing measurements: length 1.35–1.63 mm, width 0.54–0.67 mm, *C*-index = = 1.22–1.56, $t_a – t_p : t_p = 3.00–4.33$. Halteres pale yellow.

Abdomen blackish, brownish grey dusted but dorsally shining. Preabdominal terga very sparsely haired, only lateral and posterior margins with some long hair-like setae. Sterna more densely and rather long haired. *T1+2* with broad desclerotized and pale pigmented basal medial area (Fig. 831). *S5* (Fig. 827) short, reduced, with a long bristle on each side and medially with a pair of peculiar, slender, densely finely haired and setose processes.

Genitalia. Periandrium (Figs. 825, 826) medium-sized, besides the long dorsolateral and somewhat shorter laterocaudal and caudal hair-like bristles, shortly and sparsely haired. Cerci reduced, fused with periandrium, each with about 2 small hairs and ventrally with dense row of short pale hairs. Hypandrium comparatively robust. Telomere (Fig. 824) small, of complex form, bilobed; its outer lobe larger, flat, with some small setae and micropubescence, the internal lobe small, complicated, with various projections and thick bristles. Aedeagal complex (Fig. 823) with ventrally projecting phallophore almost forming the epiphallus; distiphallus very complex, with a number of processes, the most striking is the double, slender projection arising dorsally on the base of the distiphallus. Postgonite short, with peculiar apex and some thin hairs and fine pubescence in the distal half externally. Ejaculatory apodeme not observed.

Female. Head, thorax, legs. wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.51 to 1.87 mm. t_2 chaetotaxy as in the male, but with *av* in lower half of t_2 (Figs. 819, 820). mt_2 and mid trochanter with the same armature as in male. Ratio $t_2 : mt_2 = 1.57–1.64$. Wing measurements: length 1.39–1.67 mm, width 0.62–0.69 mm, *C*-index = 1.16–1.67, $t_a – t_p : t_p = 3.10–3.67$. Preabdomen as in male, *T5* and *T6* with long bristles in posterior corners.

Postabdomen (Figs. 828–830) short. *T6* and *T7* simple. *T8* divided into 2 lateral sclerites. *T9* short, with small anterior desclerotized area and a pair of dorsal setulae. *S6* and *S7* strikingly paler than the foregoing sterna and *S8*. *S7* shorter than *S6*, both shortly densely haired. *S8* dark (especially anteriorly), shortly and sparsely haired and posteriorly with medial narrow split reaching to its middle. In front of densely haired *S9* an additional well sclerotized plate connected with *S9* and with the spectacles-shaped sclerite. The latter (Fig. 833) well developed. Spermathecae (Fig. 832) vesiculate, the single more or less spherical, the paired rather hemispherical. Cerci very short, each with a longer sinuate apical hair; the dorsopreapical and ventropreapical hairs hardly longer than the lateral short setulae.

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Preimaginal stages: The egg has been described by HAMMER (1941: 261); SCHUMANN (1962: 422–423, Figs. 30–36) described and illustrated in detail all instars of larva (see Figs. 8–15). However, the puparium remains unknown.

Discussion: The species is the only representative of the genus *Chaetopodella* in the Palaearctic Region, and therefore is easily identifiable by generic characters; contrary to other *Chaetopodella* it has a uniformly coloured thorax and only the scutellum velvety black. The genitalia of all the other described species of *Chaetopodella* are unknown and consequently it is difficult to pick out the most diagnostic characters of *Ch. scutellaris*.

Ch. scutellaris (HALIDAY) is clearly recognizable from the original description and redescriptions of subsequent authors. Therefore it has not been necessary to study the type material, although some syntypes are deposited in NMI (see COLLIN, 1914, and "Type material").

Biology: A very common and often abundant species, predominantly coprophagous but frequently also on carrion. It can be classified as pasture symbovilous species because it lives on free excrement, chiefly on pasture lands — on manure (accumulated excrement) it cannot successfully compete with the species of the genus *Coproica* RONDANI. The adults occur during the whole year (RICHARDS, 1930), most abundantly in V–IX (LAURENCE, 1955) and the peak occurrence may be in VIII (MIHÁLYI, 1967). Larvae develop in excrement of various larger mammals and in human faeces, too (RICHARDS, 1930). Thanks to studies by HAMMER (1941), LAURENCE (1955) and SCHUMANN (1962) the life-history of this species is rather well known. The female lies single eggs on the surface of excrement and covers them by its excrement (HAMMER, 1941); under laboratory conditions the egg stage lasted one day, as did the first and second larval instar, while the third larval instar lasted 3 days. The duration of the pupal stage is unknown. Under natural circumstances the whole life-history lasted 20–64 days long (LAURENCE, 1955).

Distribution: The species is widespread throughout the whole of Europe (from Spain to Finland) but recorded also from Africa (Ethiopia — DUDA, 1925; Tanganyika — VANSCHUYTBROECK, 1962a; Zaire — VANSCHUYTBROECK, 1950b) and Afghanistan (PAPP, 1976b, 1978a).

13. Genus ***Kimosina*** **gen. nov.**

Group of *L. plumosula* RONDANI: RICHARDS, 1930: 299 (part.)
Type species: *Limosina plumosula* RONDANI, 1880

Diagnosis: The genus is defined by the following features.

(1) *pvt* small or absent
(2) 3–4 *if*, the most anterior usually shorter
(3) 3–7 small *ads* inside and below *ors*
(4) *g* small or of medium length
(5) 2 *hu*, the internal small
(6) 3 *dc* (all postsutural), often 2 (rarely 3) shorter presutural *dc* or enlarged *dc* microsetae
(7) 6–8 rows of *ac* hairs in front of suture
(8) scutellum comparatively large, long; *sc* long
(9) 2 *stpl*, the anterior small
(10) t_2 chaetotaxy rich (Figs. 870–872), male t_2 ventrally with double row of short spines and reduced *va*; female t_2 with distinct *av* below middle and long *va*; male f_2 basally with double short row of short ventral bristles
(11) *C* not or very slightly extended beyond R_{4+5}
(12) Cs_1 mostly long and comparatively sparsely haired
(13) R_{4+5} slightly sinuate or very slightly curved, sometimes almost straight
(14) discal cell broad but not long, regularly with obtuse-angled anterior outer corner and well developed appendages of M_{1+2} and M_{3+4} beyond t_p
(15) alula small, narrow but not acute
(16) female postabdomen short and not narrower than preabdomen at 6th segment
(17) male *S5* usually short and transverse, posteriorly often with various structures or pubescence
(18) periandrium uniformly haired, without any dorsolateral long hair but sometimes (sg. *Collimosina*) with 3 lateral bristles at ventral margin

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(19) male cerci usually large, often projecting ventrally. Subanal plate reduced but intraperiandrial sclerite well developed and mostly forming a mesolobus situated between cerci and connected by means of long arch-shaped arms with hind part of telomeres
(20) hypandrium comparatively large
(21) telomere of very complex form, consisting of 2 more or less separated parts (Fig. 861) and internally armed by various processes, keels and spines
(22) phallophore compact, robust but short, often somewhat produced ventrally (but not forming a distinct epiphallus)
(23) distiphallus membraneous, weakly sclerotized, mostly finely haired (bare in sg. *Collimosina*)
(24) postgonite slender, pointed, with some minute setulae externally
(25) ejaculatory apodeme small or absent
(26) female *T8* dorsomedially membraneous or divided into 2 lateral parts
(27) female *T9* usually short (except for sg. *Alimosina*), sometimes fused with cerci
(28) female *S7* large and rather long
(29) female *S8* extremely reduced to 1—3 minute sclerites with characteristic armature
(30) female *S9* either short and horseshoe-shaped or long, with deep anterior incision (sg. *Alimosina*) or of complex tripartite form (sg. *Collimosina*)
(31) inside 8th segment there is often an internal sclerite
(32) spermathecae of simple ball-shaped, oval, cylindrical to pear-shaped form, with short sclerotized parts of ducts
(33) female cerci comparatively short and robust, sometimes partly fused with *T9* and each bearing 1—2 short sinuate hairs (sg. *Collimosina*, *Alimosina*) or short spine besides small hairs (*Kimosina* s. str.).

Discussion: The genus *Kimosina* gen. nov. is a very distinctive group of the previous genus *Limosina*; it can be easily delimited from other genera of Limosininae by a number of apomorphic features (3—5 *dc*; rich t_2 chaetotaxy, in male with ventral double row of short spines; complex bipartite telomere; large male cerci with robust intraperiandrial sclerite; membraneous distiphallus with small dorsal sclerite connected with hypandrium; female *S8* extremely reduced and characteristically armed). The relationship of the genus *Kimosina* with other genera of Limosininae is not very obvious; it might perhaps be derived from some pre-ancestor of the genus *Minilimosina* (similarly to the *Spelobia* genera-group) but this theory cannot be convincingly demonstrated at the moment (see the chapter "Phylogeny"). The genus *Thoracochaeta* DUDA, 1918, shows some affinity to *Kimosina* gen. nov. (at least in some external features — more *dc*, long sparsely haired Cs_1, sexual wing dimorphism in some species). Unfortunately the genitalia of *Thoracochaeta* are poorly known and the above opinion is not proven.

The genus *Kimosina* is divided into 3 subgenera and includes 7 species in the Palaearctic all occurring in Europe. The subgenus *Collimosina* subgen. nov. includes only *K.* (*C.*) *spinosa* (COLLIN, 1930); similarly *Alimosina* subgen. nov. only *K.* (*A.*) *empirica* (HUTTON, 1901). The nominate subgenus *Kimosina* s. str. contains 5 Palaearctic species, viz. *K. plumosula* (RONDANI, 1880), *K. pappi* spec. nov., *K. glabrescens* (VILLENEUVE, 1917), *K. ciliata* (DUDA, 1918) and *K. longisetosa* (DAHL, 1909).

There are some non-Palaearctic species which apparently belong to *Kimosina*. 3 are known from the Australian Region — *K. thomasi* (HARRISON, 1959) comb. nov., *K. rennelli* (HARRISON, 1964) comb. nov. and *K. popularis* (RICHARDS, 1973) comb. nov. Further species were described from South America — *K. chilenica* (DUDA, 1925) comb. nov., *K. dolichoptera* (RICHARDS, 1963) comb. nov. and *K. phycophila* (RICHARDS, 1963) comb. nov. However, the final placement of these species in subgenera of *Kimosina* will depend on examination of their postabdomina.

Remarks: The genus is named in honour of Prof. KE CHUNG KIM (Pennsylvania, USA) for his excellent studies of the subfamily Sphaerocerinae.

Key to European subgenera and species

1 Small species (1.05—1.60 mm), wing comparatively short and broad (Figs. 841, 842), usually shorter than body length (of dry specimen); R_{4+5} slightly curved or almost

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straight. Periandrium with about 3 stronger lateral bristles at ventral margin (Fig. 846), male cerci very large but mesolobus not developed. Distiphallus membraneous but unhaired, postgonite not angularly bent and phallophore not projecting ventrally. Female *S7* long, with large oval area at posterior margin; female *S9* large and composed of 3 parts (Figs. 850, 851); female cerci comparatively large and with sinuate hairs (*Collimosina* subgen. nov.) . . . . . *K.* (*C.*) *spinosa* (COLLIN)

— Larger species (1.50—2.60 mm), wing longer and narrower, usually longer than body length (of dry specimen); R_{4+5} slightly sinuate. Periandrium uniformly haired, male cerci not as large but often characteristically modified, mesolobus distinctly developed. Distiphallus membraneous and finely haired, postgonite angularly bent and phallophore more or less distinctly projecting ventrally. Female *S7* simple; female *S9* sometimes large but always compact; female cerci small and each with short sinuate hairs or thick, short spine 2

2(1) *S1+2* of characteristic shape (Fig. 853), *S3* more than twice as long as *S4*. Female cerci fused with *T9* and each carrying a longer, sinuate hair (Fig. 867). Wings sexually dimorphic (Figs. 858, 859) (*Alimosina* subgen. nov.) — t_3 with a dorsal preapical bristle (Fig. 857), male *S5* (Fig. 854), male genitalia (Figs. 861, 862), female postabdomen (Figs. 867, 868), spermathecae (Fig. 869) . . . . . *K.* (*A.*) *empirica* (HUTTON)

— *S1+2* simple, *S3* hardly longer than *S4*. Female cerci with a thick, short spine. Wings not sexually dimorphic. t_3 without dorsopreapical bristle (*Kimosina* s. str.) 3

3(2) Facial cavity dark brown to black 4

— Facial cavity yellow to yellowish brown 6

4(3) Arista with very long ciliation (Fig. 834). Chaetotaxy of t_2 (Figs. 870—872) similar to that of *K. glabrescens*. Male genitalia (Figs. 876—879), female postabdomen (Figs. 864, 865), spermathecae (Fig. 866) . . . . . *K.* (*K.*) *plumosula* (RONDANI)

— Arista with medium long ciliation (Fig. 835). Male genitalia and female postabdomen different 5

5(4) Gena pale brown, contrasting with dark facial cavity. t_2 with long distal *d* situated the same distance from the apex of t_2 as *pd* (Fig. 897). Male genitalia as in Figs. 881—884, male *S5* (Fig. 885). Female unknown ***K. (K.) pappi* spec. nov.**

— Both gena and facial cavity dark brown. Male t_2 with long distal *d* situated more distally than *pd* (Fig. 895). Male genitalia as in Figs. 886—889, male *S5* (Fig. 890), female postabdomen (Figs. 891—893) and spermathecae (Fig. 894) . . . . . *K.* (*K.*) *glabrescens* (VILLENEUVE)

6(3) Arista with medium long ciliation (Fig. 836), facial cavity brownish yellow, entire frons blackish brown. Abdomen without desclerotized and pale pigmented medial area on *T1+2*, female *T7* without transverse pigmentation and cerci fused with *T9* (Figs. 900, 901), spermathecae (Fig. 903) . . . *K.* (*K.*) *ciliata* (DUDA)

— Arista with short ciliation (Fig. 837), facial cavity pale yellow, anterior part of frons brownish yellow. *T1+2* with pale pigmented medial triangular area. Female *T7* with transverse pigmentation, cerci separated from *T9* (Fig. 910), spermathecae (Fig. 913), male *S5* (Fig. 909), male genitalia (Figs. 905—908) . . . . . *K.* (*K.*) *longisetosa* (DAHL)

Subgenus *Collimosina* subgen. nov.

Type species: *Limosina spinosa* COLLIN, 1930

Diagnosis: The subgenus can be characterized as follows.

(1) *pvt* absent
(2) *occe* shorter than *occi*
(3) 3—4 *if*, the middle usually longer than others
(4) 4—6 minute *ads* inside and below *ors*

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(5) *g* comparatively small
(6) 2 *hu*, the internal small
(7) 3 *dc* (all postsutural) but in front of suture often 2—3 more or less enlarged *dc* microsetae
(8) 6 rows of *ac* hairs, the medial prescutellar pair often enlarged
(9) scutellum comparatively large, *sc* long
(10) 2 *stpl*, the anterior minute
(11) t_2 chaetotaxy (Figs. 838—840) as in the genus *Kimosina*
(12) wing comparatively short and broad, shorter than body length
(13) *C* usually very slightly extended beyond R_{4+5}
(14) Cs_1 comparatively shortly and densely haired
(15) R_{4+5} very slightly bent or almost straight (Figs. 841, 842)
(16) discal cell short; anterior outer corner obtuse-angled, both appendages of M_{1+2} and M_{3+4} present
(17) alula small, narrow, not very acute
(18) female postabdomen short, not narrower than preabdomen at 6th segment
(19) male *S5* very short, transversely band-like, simple
(20) periandrium sparsely haired but with 3 thick and longer lateral bristles at ventral margin
(21) male cerci very large, flat. Intraperiandrial sclerite not forming the typical mesolobus, but connected by long arch-shaped arms with posterior part of telomeres
(22) hypandrium rather large, dorsoventrally flattened
(23) telomere of complex form, bipartite; its fore part larger
(24) phallophore compact, not projecting ventrally
(25) distiphallus membraneous, but not haired and apically armed by a rosette of cuticular excrescences
(26) postgonite long, proximally wide, distally tapering and pointed, with some setulae on anterior margin
(27) ejaculatory apodeme rather well developed
(28) female *T8* dorsomedially membraneous but not divided
(29) female *T9* small, medially pale pigmented, with 2 small dorsal setulae
(30) female *S7* large, with distinctive oval, posterior, pale pigmented area
(31) female *S8* reduced to 2 minute, stripe-like relics, each armed by 3 small setulae
(32) female *S9* of very complex form, consisting of 3 parts (Figs. 850, 851)
(33) inside 8th female segment there is an internal plate-shaped sclerite (Fig. 851, *IS*)
(34) spermathecae simple, oval to cylindrical, with short sclerotized parts of ducts
(35) female cerci large in comparison with *T9*, each with a thicker sinuate apical hair, shorter dorsopreapical hair and small lateral setula.

Discussion: The subgenus *Collimosina* subgen. nov. is a rather aberrant taxon of the genus *Kimosina* but can be included to it on the basis of features (synapomorphies) which it shares with its remaining subgenera (i.e. *Alimosina* and *Kimosina* s. str.) — e.g. 3 *dc*, t_2 chaetotaxy, male f_2, short and transverse male *S5*, large male cerci, bipartite telomere, membraneous distiphallus with dorsal sclerite connected with hypandrium, reduced female *S8*. On the contrary, *Collimosina* subgen. nov. differs essentially from other *Kimosina* in having short and broad wings, large and peculiar female *S7*, tripartite female *S9*, periandrium with 3 lateral bristles at ventral margin, intraperiandrial sclerite without distinct mesolobus, simple phallophore, distiphallus without pubescence, postgonite not angularly bent etc. (see cladogram in Fig. 65).

The subgenus includes only the type species, viz. *K.* (*C.*) *spinosa* (COLLIN, 1930). This species somewhat superficially imitates the species of the genus *Spelobia*, and consequently, it was wrongly placed by COLLIN (1930) and RICHARDS (1930) in alliance with *Spelobia parapusio* (DAHL) so that its real relationship has not been recognized up to the present.

Remarks: The subgenus is named in honour of J. E. COLLIN, the outstanding British dipterologist and discoverer of its type species.

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Kimosina (Collimosina) spinosa (COLLIN, 1930), comb. nov.

(Figs. 838–852)

Limosina spinosa COLLIN, 1930: 20; PAPP, 1973c: 60 (key)
Leptocera (*Limosina*) *spinosa*: RICHARDS, 1930: 303
Limosina (*Limosina*) *spinosa*: DUDA, 1938: 148
Leptocera spinosa: NARTSHUK, 1970: 349

Type material: Holotype ♂ labelled: "Burwell Fen 20. 3. 10" (on circular label) (UMO, examined).

Material examined (besides "Type material"): 31 ♂ 43 ♀

Czechoslovakia: 30 ♂ 41 ♀ (JRO, SMO, UMO) – Moravia: Řásná nr. Telč, Úvalenské louky (distr. Opava) (ROHÁČEK leg.).

Finland: 1 ♂ 1 ♀ (ZMH) – Ab: Nystad (HELLÉN leg.); N: Esbo-Westend (HACKMAN leg.).

USSR: 1 ♀ (ZMH) – Kr: Paanajärvi (FREY leg.).

Description:

Male. Total body length 1.06–1.45 mm. General colour black to blackish brown, brownish dusted but rather shiny. Head black, brown dusted. Frontal triangle shining black, medially with a narrow, silvery grey dusted stripe. Orbits, interfrontalia and ocellar triangle silvery grey dusted; the rest of frons blackish brown pollinose and dull. True *pvt* absent; 3–4 (rarely) *if*, the middle pair usually distinctly longer than others. 4–6 small *ads* inside and below *ors*. Anterior margin of frons and basal margin of frontal lunule brown. Face, gena and facial cavity brownish black to black, the latter shiny. *g* comparatively small. Eye normal, convex, its diameter about 5.1 times the narrowest genal width. Antennae blackish; arista about 4.5 times as long as antenna and comparatively long ciliate.

Thorax brownish black, mesonotum despite some pruinosity shining, pleurae more densely brown dusted and dull. 2 *hu*, the internal small. 3 distinct postsutural *dc*; often in front of suture 2–3 more or less enlarged microsetae. 6 rows of *ac* hairs in front of suture; the innermost prescutellar *ac* pair usually somewhat enlarged. Scutellum comparatively large, roundly triangular; *sc* long. Pleurae with paler brown sutures between sclerites. 2 *stpl*, the anterior minute, hair-like. Legs brownish black, trochanters, knees and tarsi brown. Femora comparatively robust (especially f_1 and f_3). t_2 chaetotaxy (Fig. 840). t_2 curved and ventrally bearing a double row of short black spines; *va* reduced. f_2 basally with a short double row of short bristles. mt_2 ventrally subbasally with an enlarged seta (not distinct in all specimens). Ratio t_2: mt_2 = 1.92–2.11. Wing rather variable, normal (Fig. 842) to somewhat abbreviated (Fig. 841), with pale brownish membrane and brown veins. *C* darker and slightly (often indistinctly) extended beyond R_{4+5}. R_{4+5} very slightly bent to *C* or almost straight. Discal cell short; its anterior outer corner obtuse-angled, both outer corners with short appendages of M_{1+2} and M_{3+4}. Alula small and narrow. Wing measurements: length 0.90–1.25 mm, width 0.41–0.58 mm, *C*-index = 0.78–1.07, t_a–t_p: t_p = 1.07–2.22.

Abdomen brownish black, sparsely greyish dusted, rather shining. Terga shortly and moderately densely haired, sterna more densely setose. *T1+2* simply pigmented and sclerotized. *S5* (Fig. 848) very short, transversely band-like, posteriorly with membraneous finely haired and medially finely spinose margin and with only single row of rather robust bristles.

Genitalia. Periandrium (Figs. 846, 847) sparsely haired, with about 3 longer and thicker bristles at ventral margin. Cerci very large, flat, distinctly separated from periandrium, each with numerous bristles and fine setulae. Intraperiandrial sclerite small but with long arms connecting with posterior part of telomeres. Hypandrium large, with dorsoventrally flattened distal part (Fig. 845). Telomere (Fig. 844) small but of complex form, rather bipartite. Its anterior part flat, convex, wing-shaped; posterior part slender, directed posterointernally and armed by some setulae. Aedeagal complex (Fig. 843) with compact phallophore (contrary to other *Kimosina* not projecting ventrally) and membraneous distiphallus being reinforced only by a column composed of small sclerites and apically armed by small rosette of cuticular excrescences. Dorsally to distiphallus there is a stripe-like connective between postgonites and hypandrium. Postgonite long, proximally wide, apically tapering and pointed, and with 3 setulae on anterior margin. Ejaculatory apodeme well developed.

Female. Similar to male but differs as follows. Total body length 1.17–1.60 mm. t_2 chaetotaxy (Figs. 838, 839) different, ventrally with distinct (although small) *av* and long *va*. f_2 simply haired. Ratio t_2: mt_2 = 1.92–2.08. Wing measurements: length 1.04–1.38 mm, width 0.47–0.63 mm, *C*-index = 0.72–1.11, t_a–t_p: t_p = 1.44–2.22. Preabdomen dorsally more densely haired than in male.

Postabdomen (Figs. 849–851) highly characteristic. *T6* and *T7* simple. *T8* medially membraneous, pale pigmented. *T9* of roundly triangular form, medially with pale pigmented stripe, dorsally with 2 small setulae. *S7* very large, with distinctive oval posterior pale pigmented area. *S8* reduced to 2 small, stripe-like relics, each carrying 3 small setulae. *S9* large and of very complex form, composed of 3 parts – the largest posterior is flat, pale pigmented and bearing 2 ventral setulae; the middle is formed by 2 small, heavily sclerotized, dark and more laterally situated sclerites; the anterior is flat and weakly sclerotized. Inside 8th segment there is an internal sclerite (Fig. 851, *IS*) of rather simple, perpendicular plate-shaped form. Spermathecae (Fig. 852) simply oval to cylindrical, with short sclerotized parts of ducts. Cerci large compared to *T9*, each with a short but robust sinuate apical hair, shorter dorsopreapical hair and small lateroventral setula.

Discussion: The species differs from all other *Kimosina* species and hence it is placed in a separate subgenus *Collimosina*. It can be recognized by the features given in the key – besides the terminalia its wing is thought to be the most diagnostic feature. I should like to point out the hitherto unknown great variability of wings (see Figs. 841, 842) of this species. I found a population where shorter winged specimens predominate and, on the contrary, another population with a majority of normal specimens. However, I have found intermediate forms (in both populations) and the examination of the terminalia clearly demonstrated the conspecifity of these populations.

The male holotype (UMO) has been examined and it is conspecific with Czechoslovakian specimens as are the specimens from Finland and Karelia I have also studied.

Biology: *K. spinosa* was considered a very rare species. Besides the unique male from which it was described (COLLIN, 1930) only 2 additional specimens were recorded in the literature (PAPP, 1973c, 1976a), one of which was caught by soil traps. However, I have found more specimens from 2 localities in Moravia (see "Material examined") – one of them is a lowland boggy meadow (about 290 m a.s.l.) and the second is an upland peat-bog meadow (about 700 m a.s.l.). All specimens were obtained by sifting moss and grass

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(first locality) or by sifting Sphagnum (second locality). The first locality was visited regularly (3—4 weak intervals) in 1978 but *K. spinosa* was found only in IV—VI and IX. The species is apparently terricolous and is probably confined to space-limited microhabitats because it was collected only in a small place (about 20 × 20 m); attempts to sift it from other similar parts of the locality as well as use of soil traps (situated outside the above collecting place) have not been successful. The species seems to be incapable of flight and its wings tend to be shortened; especially in the population from the lowland boggy meadow the majority of specimens had smaller wings. The adults occur in III—VI and VIII—IX (combined published data and material examined).

Distribution: Hitherto known only from Europe — GB: England (COLLIN, 1930; RICHARDS, 1930, 1976), Czechoslovakia (material examined, new), Hungary (PAPP, 1973c, 1976a), Finland, USSR: Karelia (material examined, new).

Subgenus ***Alimosina*** **subgen. nov.**

Type species: *Borborus empiricus* HUTTON, 1901

Diagnosis: The subgenus can be defined as follows.

(1) *pvt* distinctly developed though hair-like
(2) *occe* and *occi* of the same length
(3) 4 *if*, the anterior may be shorter
(4) 5—7 *ads* inside and below *ors*
(5) *g* moderately long
(6) 2 *hu*, the internal small
(7) 5 *dc* (3 postsutural, 2 shorter presutural)
(8) 8 rows of *ac* hairs in front of suture; the medial prescutellar *ac* pair enlarged
(9) scutellum large, long; *sc* long
(10) 2 *stpl*, the anterior small; in front of them usually a third artificial *stpl* (= the most dorsal hair of a perpendicular row of hairs on sternopleuron)
(11) t_2 chaetotaxy (Figs. 855, 856) as in the genus *Kimosina*; also male f_2 similarly armed. t_3 with distinctive dorsopreapical seta (Fig. 857)
(12) wing sexually dimorphic (Figs. 858, 859)
(13) *C* not extended beyond R_{4+5}
(14) Cs_1 rather long but densely haired
(15) R_{4+5} very slightly sinuate
(16) discal cell with obtuse-angled anterior outer corner and with distinct appendages of M_{1+2} and M_{3+4}
(17) alula small, narrow but not pointed
(18) female postabdomen short and not essentially narrower than preabdomen at 6th segment
(19) *S1+2* modified, *S3* unusually long (Fig. 853)
(20) male *S5* longer than in *Kimosina* s. str., posteromedially with minute sclerites
(21) periandrium uniformly but rather long haired
(22) male cerci large, projecting ventrally, heavily sclerotized and richly setose; mesolobus comparatively small, pointed
(23) hypandrium relatively large
(24) telomere of complex bipartite form
(25) phallophore rather short and projecting ventrally in a small pointed process
(26) distiphallus weakly sclerotized and finely haired
(27) postgonite large, slender, angularly bent and with characteristic posterior flat process and some setulae on anterior margin
(28) ejaculatory apodeme absent
(29) female *T8* divided into 2 lateral parts
(30) female *T9* long, medially membraneous, posteriorly fused with cerci
(31) female *S7* normal, with a pair of longer bristles

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(32) female *S8* reduced to 3 small sclerites (1 short transverse and bare anterior; 2 very small posterior — each armed by 2 short bristles)
(33) female *S9* large, long, surrounding the whole distal part of postabdomen, ventrally with a deep anterior incision
(34) inside 8th female segment there is a small pointed internal sclerite (Fig. 868, *IS*)
(35) spermathecae pear-shaped, with short sclerotized parts of ducts
(36) female cerci each with a longer apical sinuate hair and 2 short setulae; otherwise bare and fused with *T9*.

Discussion: The subgenus *Alimosina* subgen. nov. includes only the type species — *Kimosina empirica* (HUTTON, 1901). There are apparently no other species associated with this subgenus among non-Palaearctic species of *Kimosina*. None of the species described from the Australian Region has the dimorphic wings, modified fore abdominal sterna and dorsopreapical bristle on t_3; similarly the South American *K. dolichoptera* (RICHARDS) and *K. phycophila* (RICHARDS), resembling sg. *Alimosina* in their wing dimorphism and female cerci with undulating hairs, differ in having normal abdominal sterna, no preapical bristle on t_3, very sparsely haired Cs_1 and other characters.

The modified *S1+2* and *S3*, wing dimorphism and structure of the female postabdomen are thought to be the most significant features characterizing the subgenus *Alimosina*. The presence of a preapical dorsal bristle on t_3 does not seem to be too important as it is a plesiomorphic feature (commonly occurring in the much more primitive subfamily Copromyzinae) persisting as an atavism also in some species of various and not closely related groups of the previous genus *Limosina* MACQUART.

Kimosina (Alimosina) empirica (HUTTON, 1901), **comb. nov.**

(Figs. 853–863, 867–869)

Borborus empiricus HUTTON, 1901: 94
Leptocera (Limosina) empirica: HARRISON, 1959: 270; RICHARDS, 1973: 370
Limosina empirica: PAPP, 1973c: 47 (key)
Limosina (Leptocera) pectinifera VILLENEUVE, 1918a: 333
Leptocera (Limosina) pectinifera: RICHARDS, 1930: 300
Limosina (Limosina) pectinifera: DUDA, 1938: 137
Leptocera pectinifera: NARTSHUK, 1970: 345 (key)
Limosina (Scotophilella) cadaverina DUDA, 1918: 130
Leptocera (Scotophilella) cadaverina: DUDA, 1925: 157, 161 (key)
Leptocera cadaverina: SÉGUY, 1934: 465

Type material:
Borborus empiricus HUTTON: Holotype ♀: Christchurch, no date, deposited in Canterbury Museum, Christchurch, N. Z. (HARRISON, 1959) (not examined).
Limosina (Leptocera) pectinifera VILLENEUVE: described from 2 ♂, Rambouillet (France), taken in March and October, 1917 (VILLENEUVE, 1918a). Location of type unknown, probably lost (not examined).
Limosina (Scotophilella) cadaverina DUDA: Holotype ♀ labelled: "Wien, 20. X. 1916, Menschenleiche, J. MÜLLER" and "*cadaverina* m. det. DUDA, nov. sp." (NMW, examined).

Material examined (besides "Type material"): 16 ♂ 10 ♀
GB: 1 ♂ 2 ♀ (UMO) — England: Oxford (HAMM leg.), Kincraig (R. H. leg.).
The Netherlands: 1 ♂ (JRO) — Lunteren (EVENHUIS leg.).
Belgium: 1 ♂ 1 ♀ (IRB) — La Ranne-Edos, Forêt de Soignes (VANSCHUYTBROECK leg.).
FRG: 1 ♂ (ZMB) — without further data (DUDA leg.).
Czechoslovakia: 4 ♂ 4 ♀ (JRO, VUP) — Bohemia: Praha (ZUSKA, VERNER leg.), Duchcov (LAŠTOVKA leg.), Kunětická hora Mt. (MOCEK leg.); Moravia: Třešť (ROHÁČEK leg.); Slovakia: Lubochňa (ROHÁČEK leg.).
Hungary: 2 ♂ 2 ♀ (TMB) — Kiskunsági NP—Agasegyháza (PAPP leg.).
Denmark: 1 ♂ (ZMK) — SJ: Als Nørreskov (LYNEBORG leg.).
Finland: 5 ♂ 1 ♀ (ZMH) — Ab: Bromarv (NUORTEVA leg.).

Description:
Male. Total body length 1.91–2.14 mm, general colour blackish brown, brown dusted. Head brownish black, brown dusted and dull. *pvt* distinct, though hair-like. Interfrontalia bearing 4 *if*, almost of equal length, the most anterior may be rather shorter; 5–7 *ads* inside and below *ors*. Frontal lunule paler brown dusted, facial cavity dark brown. Eye somewhat smaller than in *Kimosina* s. str. species, its largest diameter about 2.5 times the smallest genal width. *g* moderate. Antennae dark brown, arista rather long ciliate.

Thorax brown dusted and especially pleurae dull. 3 postsutural *dc* and 2 shorter presutural ones in addition. Prescutellar medial *ac* pair enlarged, *ac* microsetae in 8 rows in front of suture. 2 *stpl*, the posterior very long, often an additional hair in front of them — this artificial *stpl* is in fact the most dorsal hair of a perpendicular row on mesopleuron. Scutellum large, long, with 4 long *sc*. Legs brown, knees, trochanters and tarsi paler. t_2 strongly curved and its ventral chaetotaxy modified for holding the female during copulation (Fig. 856), dorsal chaetotaxy as in female (Fig. 855). Also f_2 with distinctive cluster of short ventral spines at the base developed for the same purpose. t_3 with long dorsopreapical bristle (Fig. 857). Ratio t_2: $mt_2 = 1.84–2.06$. Wing pale brownish, veins brown (Fig. 858). Cs_1 rather long but densely haired. *C* not ex-

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tended beyond R_{4+5}. R_{4+5} very slightly sinuate; the anterior outer corner of discal cell obtuse-angled. Alula small. Wing measurements: length 1.95–2.18 mm, width 0.73–0.87 mm, *C*-index = 0.98–1.06, $t_a - t_p : t_p = 2.00–2.38$. Halteres brown, with yellowish brown stem.

Abdomen brown dusted and densely haired (in comparison with *Kimosina* s. str. species). *S1+2* peculiarly modified, with a pair of long medial bristles on posterior margin, *S3* very long, longer than wide (Fig. 853). *S5* (Fig. 854) simple in shape and hairs but medially on posterior margin with 2 pairs of small sclerites; the internal sclerites more pigmented and sclerotized, the external sclerites pale pigmented and each bearing 4 setae.

Genitalia. Periandrium (Figs. 861, 862) sparsely and rather long haired, especially ventrocaudally. Cerci large, projecting ventrally, heavily sclerotized, with some longer and shorter bristles. Mesolobus ventrally pointed, dorsally forked and forming the usual intraperiandrial sclerite connected with hind parts of telomeres. In caudal view, the hind part of telomere entirely covers its relatively small fore part. Fore part of telomere (Fig. 860) bilobed, the external lobe larger and bristled, the internal lobe bare, produced anteriorly. Aedeagal complex (Fig. 863). Aedeagal apodeme large, phallophore short, ventrally projecting in a small, pointed process. Distiphallus small, widened laterally and flattened dorsoventrally, very finely haired. Also its small dorsal sclerite haired. Postgonite large, angularly curved, apically pointed, with about 4 small setulae on anterior margin, basally with a flat process projecting backwards. Ejaculatory apodeme not found.

Female. Head, thorax, legs and preabdomen as in the male unless mentioned otherwise. Total body length 2.26–2.66 mm. Mid leg without modification mentioned in the male but t_2 with distinct *av* in apical two-fifths and with a long *va*. Ratio $t_2 : mt_2 = 1.78–1.94$. t_3 with dorsopreapical bristle as in male. Wing different from that of male in consequence of modifications which have evolved as an adaptation for mating. Wing is longer and has strikingly bent Cs_2 (Fig. 859). For explanation of this phenomenon see discussion. Wing measurements: length 2.38–2.50 mm, width 0.75–0.87 mm, *C*-index = 1.00–1.08, $t_a - t_p : t_p = 1.76–2.23$.

Postabdomen (Figs. 867, 868). *T8* divided into 2 lateral plates; *T9* long, only laterally sclerotized, medially membraneous, dorsally bare, fused with cerci. *S7* sparsely and shortly haired, with a pair of longer bristles. *S8* consisting of 3 small sclerites – a short transverse one behind *S7* and 2 very small ones situated more caudally, each armed by 2 short bristles. *S9* large, surrounding the whole distal part of postabdomen, and ventrally with a deep anterior incision. Inside postabdomen a small, internal, pointed sclerite which is probably a sclerotized part of vagina as the spermathecal ducts terminate there. Spermathecae (Fig. 869) pear-shaped, with short sclerotized parts of ducts. Cerci each with a longer apical hair and 2 short hairs, otherwise bare and fused with *T9*.

Discussion: A very distinctive species differing substantially from all other species of the genus *Kimosina*, and hence placed in a separate subgenus *Alimosina* subgen. nov. It is quite impossible to decide which of other species may be its closest relative. The descriptions of species from outside the Palaearctic do not describe the postabdomina and therefore they form a poor basis for the correct evaluation of their relationships.

However, there is an important phenomenon in *K. empirica* (HUTTON) which is worthy of discussion – the sexual wing dimorphism. The male has simple wings, in the female modified. This modification was certainly developed in consequence of the peculiar mating behaviour of this species – during copulation the male holds the female wings (just in Cs_2) in its characteristically formed and armed mid legs (cf. also RICHARDS, 1930: 320). It is interesting that two South American species of *Kimosina* have sexually dimorphic wings and similarly formed male mid legs (RICHARDS, 1963b). However, these species, viz. *K. dolichoptera* (RICHARDS, 1963) and *K. phycophila* (RICHARDS, 1963) do not have the *S1+2* and *S3* formed as in subg. *Alimosina* and might therefore represent a further subgenus of the genus *Kimosina*.

Biology: A necrophagous species found on carrion of various animals (breeding records – RICHARDS, 1930, 1955, 1973; HARRISON, 1976) and in meat refuse, often also on house windows. ZUSKA & LAŠTOVKA (1969) found it in abattoirs. The species is clearly associated with human settlements and therefore RICHARDS (1930) placed it as a "domestic species". Adults occur throughout the whole year. *K. empirica* probably originates from Australian Region where it occurs in the wild (HARRISON, 1976) and, having been spread by trade to other countries, it became exclusively synanthropic there.

Distribution: Now cosmopolitan, originally probably Australian. Known from New Zealand and neighbouring islands (RICHARDS, 1955; HARRISON, 1959, 1976), Australia (RICHARDS, 1973), South America (RICHARDS, 1967), Canada (FREDEEN & TAYLOR, 1964), Azores (HACKMAN, 1960), Iceland (DUDA, 1938), Faeroe Is. (LYNEBORG, 1968); from Europe recorded from: GB: England (RICHARDS, 1930, 1973, 1976), France (VILLENEUVE, 1918a; SÉGUY, 1934), Belgium (VANSCHUYTBROECK, 1942), The Netherlands, FRG (material examined, new), Czechoslovakia (ZUSKA & LAŠTOVKA, 1969; ROHÁČEK, 1978b), Austria (DUDA, 1918), Hungary, Denmark and Finland (material examined, new).

Subgenus ***Kimosina*** s. str.

Type species: *Limosina plumosula* RONDANI, 1880

Diagnosis: The subgenus can be characterized as follows.

(1) *pvt* minute or absent

(2) *occe* shorter than *occi*

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(3) 3—4 *if*, the anterior small
(4) 3—5 minute *ads*, inside and below *ors*
(5) *g* thin and of medium length
(6) 2 *hu*, the internal small
(7) 3 postsutural *dc*, sometimes 2 shorter presutural *dc* in addition
(8) 6—8 rows of *ac* microsetae in front of suture, the medial prescutellar *ac* pair enlarged
(9) scutellum long, roundly triangular; *sc* long
(10) 2 *stpl*, the anterior small, hair-like
(11) t_2 chaetotaxy (Figs. 870—872); male t_2 and f_2 armed as described in the genus
(12) *C* not extended beyond R_{4+5}
(13) Cs_1 long and comparatively sparsely haired
(14) R_{4+5} very slightly sinuate
(15) discal cell broad but not long, with obtuse-angled anterior outer corner; both appendages of M_{1+2} and M_{3+4} beyond t_p rather long
(16) alula small, narrow but not pointed
(17) female postabdomen short and not narrower than preabdomen at 6th segment
(18) male *S5* short and transverse, posteromedially often with distinctive structures or pubescence
(19) periandrium uniformly haired, without any long bristle
(20) male cerci often enlarged and flattened or fused with periandrium, mostly with long setae. Subanal plate reduced but intraperiandrial sclerite very robust, forming a ventrally projecting mesolobus between cerci and connected by means of long arch-shaped arms with posterior part of telomeres
(21) hypandrium comparatively large
(22) telomere of very complex form, consisting of 2 more or less separated parts and bearing numerous internal processes, keels, spines etc.
(23) phallophore short but robust, often produced ventrally
(24) distiphallus membraneous, weakly sclerotized and finely haired
(25) postgonite slender, angularly bent, with some small hair-like setulae on outer side
(26) ejaculatory apodeme usually absent
(27) female *T8* dorsomedially membraneous or divided into 2 lateral plates
(28) female *T9* short, sometimes fused with cerci and carrying 2 dorsal setulae
(29) female *S7* normally developed
(30) female *S8* extremely reduced in 1—3 minute sclerites with characteristic armature (Figs. 865, 902)
(31) female *S9* small and horseshoe-shaped, or larger with deep anterior incision
(32) spermathecae ball- to pear-shaped, with short sclerotized parts of ducts
(33) female cerci short, each with a thick and short spine besides some small hairs.

Discussion: The subgenus *Kimosina* s. str. is more closely related to *Alimosina* subgen. nov. than to *Collimosina* subgen. nov. and is therefore placed as its sister-group in the supposed cladogram of interrelationships of subgenera of *Kimosina* (see Fig. 65). *Kimosina* s. str. shares with sg. *Alimosina* a number of synapomorphic characters (e.g. mesolobus, haired distiphallus, angularly bent postgonite, ventrally produced phallophore) but differs from it in having more sparsely haired Cs_1, wings not sexually dimorphic, female cercus armed by a short spine, normal $S1+2$ and *S3*, short female *S9* etc.

The subgenus *Kimosina* s. str. includes 5 species in Europe — they are fully enumerated in the discussion under the genus *Kimosina* (p. 116). It is not certain which other non-Palaearctic species belong to this subgenus. In my opinion, some Australian species may belong here — e.g. *K. thomasi* (Harrison, 1959), *K. rennelli* (Harrison, 1964), and *K. popularis* (Richards, 1973); perhaps also *K. chilenica* (Duda, 1925) from South America. A detailed examination of these and other species is necessary for their correct classification.

Kimosina (Kimosina) plumosula (Rondani, 1880), **comb. nov.**

(Figs. 834, 864—866, 870—873, 876—880, 915)

Limosina plumosula Rondani, 1880: 27; Papp, 1973c: 48 (key)
Limosina (Scotophilella) plumosula: Duda, 1918: 125

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Leptocera (*Scotophilella*) *plumosula*: DUDA, 1925: 157 (key)
Leptocera plumosula: SÉGUY, 1934: 468; NARTSHUK, 1970: 348 (key)
Limosina (*Limosina*) *plumosula*: DUDA, 1938: 138

Type material: Holotype ♂ labelled: "1933" (= a catalogue No. – red numeral on oval label) (MSF, examined). According to RONDANI (1880) the specimen originates from Parma env. (Italy).

Material examined (besides "Type material"): 22 ♂ 18 ♀

Canary Islands: 1 ♂ (ZMB) – Guimar (BECKER leg.).

Spain: 6 ♂ 4 ♀ (JRO) – Güejar Sierra nr. Granada, Grazalema nr. Ronda, Zanara nr. Ronda (ROHÁČEK leg.).

GB: 3 ♂ 2 ♀ (UMO) – England: Oxford (HAMM leg.).

Belgium: 1 ♀ (IRB) – Lanaye Grotte (COLLART leg.).

FRG: 1 ♂ (TMB) – München-Nymphenb. Schloßgärtnerei (SCHACHT leg.).

Poland: 3 ♂ (ZMB) – Rosental b. Habelschwerdt, Wustung b. Habelschwerdt (DUDA leg.).

Czechoslovakia: 4 ♂ 4 ♀ (JRO, NMP, SMO) – Bohemia: Praha-Kunratice (KOVÁŘ leg.); Moravia: Mor. Kras-Holštýn, Křtiny, Vizovické vrchy Mts.-Ploština (ROHÁČEK leg.), Lednice (VAŇHARA leg.).

Austria: 1 ♀ (IZI) – Tyrol: Obergurgl Mt. (STOCKNER leg.).

Hungary: 2 ♂ 3 ♀ (TMB) – Bükk hg. (TÓTH leg.), Bodvaszilas-Alsóhegy (HORVATOVICH leg.), Budapest-Irhásárok (MIHÁLYI leg.), Pomáz (without collector).

Italy: 1 ♀ (ZMB) – Alassio (BECKER leg.).

Bulgaria: 1 ♂ 2 ♀ (IZS) – Katschula-Strandja, E. Rhodope Mts.-Bojuk Dere, V. Mandritza (BESCHOVSKI leg.).

Finland: 1 ♂ (ZMH) – N: Helsingfors (FREY leg.).

Description:

Male. Total body length 1.59–1.83 mm, general colour brownish black and brownish grey dusted. Head with blackish brown frons, silvery grey dusted orbits, interfrontalia, narrow frontal triangle and frontal lunule. Anterior part of frons often reddish brown, facial cavity brownish black. *pvt* minute; 3 longer and 1 (the most anterior) small *if*; other head chaetotaxy typical for the subgenus and genus respectively. Antennae blackish brown, arista strikingly long ciliate (Fig. 834) and about 4.0 times as long as antenna.

Thorax brownish black, brown or brownish grey pollinose, especially on pleurae. 2 *hu*, the internal small. 3 long postsutural *dc* and usually 2 short presutural ones. 8 rows of *ac* hairs in front of suture, the medial prescutellar *ac* pair distinctly enlarged. Scutellum elongate triangular, *sc* long. 2 *stpl*, the anterior small. Legs brown. t_2 chaetotaxy (Fig. 872) similar to that of *K. glabrescens*, ventrally with double row of short black spines and rather short *va*. f_2 with double cluster of short bristles on the base, similarly to *K. empirica* but t_2 a little less curved than in that species. Ratio t_2: mt_2 = 1.79–2.07. Wing (Fig. 873) light brownish, veins brown, *C* the darkest and not produced beyond R_{4+5}. Cs_1 long and sparsely haired. R_{4+5} distinctly sinuate. Discal cell with convex M_{3+4} and rather long appendages of M_{1+2} and M_{3+4} beyond t_p (the latter longer). Alula small, narrow, apically rounded. Wing measurements: length 1.75–2.18 mm, width 0.67–0.89 mm, *C*-index = 1.05–1.12, t_a–t_p : t_p = 2.64–3.22. Halteres brown, knob darker.

Abdomen brownish black, greyish brown pollinose, dorsally sparsely, ventrally more densely haired. *T1+2* basally medially a little paler pigmented but not desclerotized. *S5* (Fig. 880) very short, posteriorly with dark, finely and densely haired lobe separated by pale membraneous area from the rest of *S5*.

Genitalia. Periandrium (Figs. 878, 879) sparsely and moderately long haired. Cerci, on the contrary, with many long hairs. Mesolobus long, ventrally bearing 2 small, lateral, wing-shaped sclerites, dorsally forking and forming the usual intraperiandrial sclerite connected to hind parts of telomeres. Hypandrium rather robust, telomere of 2 parts. The hind part of telomere complicated, with a short blunt spine and 2 longer hairs; the fore part (Fig. 877) with small, external, rod-like projection bearing 3 setae on apex and with a very large, sickle-shaped internal lobe. Middle part of telomere finely pubescent. Aedeagal complex (Fig. 876) composed of short, ventrally projecting phallophore and membraneous, apically extended and finely haired distiphallus. Further part of distiphallus of bifurcate form is situated dorsally to main part. Postgonite slender, basally angularly bent, with finger-like apex and 2 very small subapical setulae. Ejaculatory apodeme not observed.

Female. Similar to male but differs as follows. Total body length 1.50–2.14 mm. t_2 chaetotaxy as in Figs. 870, 871, thus differing from that of male, ventrally with a long *va* and shorter *av* below middle. t_2 not curved. Ratio t_2: mt_2 = 1.76–1.88. Wing measurements: length 1.98–2.50 mm, width 0.71–0.91 mm, *C*-index = 1.14–1.27, t_a–t_p: t_p = 3.16–3.54.

Postabdomen (Figs. 864, 865). *T8* divided into 2 lateral plates; *T9* short, medially membraneous, with a pair of dorsal bristles. *S8* reduced to a small sclerite more sclerotized and pigmented only laterally and bearing 2 short blunt spines on each side. *S9* narrowly horseshoe-shaped. Spermathecae (Fig. 866) ball-shaped, with short sclerotized ducts. Cerci each with a short, pointed spine and some small hairs.

Discussion: *K. plumosula* (RONDANI) belongs with *K. pappi* spec. nov. and *K. glabrescens* (VILLENEUVE) to a separate species-group which is characterized by the male genitalia with reduced cerci and mesolobus ventrally with peculiar wing-shaped sclerites. The species most closely related to *K. plumosula* is undoubtedly *K. pappi* spec. nov. which has a similar aedeagal complex and male *S5*. *K. plumosula* is easily distinguishable from all other congeners by the extremely long ciliation of the arista and the characteristic telomere.

The species is readily recognizable from the original description and redescriptions given by DUDA (1918, 1938); despite this its identity was confirmed by examination of the holotype.

Biology: *K. plumosula* occurs in damp places, mostly under decayed vegetation (DUDA, 1938; RICHARDS, 1930; COE, 1962a; PAPP, 1973c). There are also some records from house windows (RICHARDS, 1930; SÉGUY, 1934; DUDA, 1938), and from caves (DUDA, 1928; SÉGUY, 1934; VANSCHUYTBROECK, 1942). According to RICHARDS (1930) and PAPP (1973c) adults were found throughout the whole year. DUDA (1938) refers about the mass-occurrence of this species in woodland meadows but generally it is uncommon.

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Distribution: Known from many countries of Europe and also from Canary Is. (DUDA, 1918; FREY, 1936; PAPP, 1977a), Madeira (DUDA, 1918), Azores (HACKMAN, 1960), Ethiopia (DUDA, 1925, 1938) and Ecuador (RICHARDS, 1967). I have examined 8 specimens reported by VANSCHUYTBROECK (1950b) from Bas Congo (Banana, Loango, Mateba, Boma, dep. in IRB) and found that none of them belongs to *K. plumosula* or even to *Kimosina* gen. nov. Thus, it is necessary to re-examine all material from non-European countries as it is very probable that other species are included in the above records. PAPP's (1976b) record from Afghanistan belongs to *K. glabrescens* (cf. PAPP, 1978a — as *L. pteremoides* PAPP). In Europe there are records from Spain (DUDA, 1918; HACKMAN, 1969b), France (BEZZI, 1903; SÉGUY, 1934), GB: England (RICHARDS, 1930, 1976), Belgium (VANSCHUYTBROECK, 1942), FRG, GDR (DUDA, 1918), Poland (DUDA, 1938), Czechoslovakia (ROHÁČEK, 1978b), Austria (DUDA, 1918), Hungary (DUDA, 1918; PAPP, 1973c), Italy (RONDANI, 1880; DUDA, 1918), Jugoslavia (DUDA, 1918; COE, 1962a), Roumania (DUDA, 1918), Bulgaria (material examined, new), Estonia (HACKMAN, 1972) and Finland (FREY, 1941).

Kimosina (Kimosina) pappi spec. nov.

(Figs. 874, 881–885, 897)

Type material: Holotype ♂: Jugoslavia, Serbia, Kosovo Metohija, Prevalac (defile), 1,550 m, 13. 6. 1967, P. LAUTERER leg. (MMB). Abdomen detached, genitalia dissected and both preserved in a plastic tube in glycerine; only right wing present and mounted on a microslide pinned below type specimen.

Description:

Male. Total body length 1.95 mm. General colour blackish brown, brown dusted. Head with dark brown occiput; frons blackish dusted and dull, only orbits and narrow frontal triangle silvery grey pollinose and anterior part of frons pale brown. *pvt* very small; 3 long *if* and 1 very small one in front of them; 5 minute *ads* inside and below *ors*. Frontal lunule whitish grey pollinose, facial cavity dark brown, grey pollinose. Face and gena pale brown and contrasting with dark coloured facial cavity. Genal width about one third of the largest eye diameter. *g* relatively long. Antennae dark brown. Arista about 3.6 times as long as antenna, its ciliation hardly shorter than in *K. glabrescens*.

Thorax blackish brown, mesonotum rather shiny, pleurae more heavily dusted and dull. Mesonotal chaetotaxy as in *K. glabrescens* — 3 postsutural *dc*, *ac* hairs in 6 rows in front of suture, the prescutellar medial *ac* pair enlarged, as long as the anterior *dc*. 2 *stpl*, the posterior very long, the anterior minute. Scutellum long, with long *sc*. Legs brown, knees and tarsi paler. f_2 ventrally with basal cluster of short bristles. Dorsal chaetotaxy of t_2 as in Fig. 897, ventral side with double row of short spines in apical third and relatively short *va*. The posteroapical bristle robust, twice as long as *va*. Ratio t_2: mt_2 = 1.85. Wing (Fig. 874) pale yellowish brown, veins brown or brownish yellow. Cs_1 sparsely and long haired; R_{4+5} slightly sinuate, apically almost straight; discal cell long, with distinct appendages of M_{1+2} and M_{3+4}. Alula small but larger than that of *K. glabrescens*. Wing measurements: length 2.18 mm, width 0.89 mm, *C*-index = 1.03, t_a–t_p: t_p = 2.93. Halteres brown, knob darker.

Abdomen dark brown, dusted, a little shiny, dorsally sparsely, ventrally more densely but shortly haired. *S5* (Fig. 885) very similar to that of *K. plumosula* but longer and medial finely haired posterior lobe with 4 longer hairs.

Genitalia. Periandrium (Figs. 883, 884) similarly formed as in *K. plumosula* but longer haired. Cerci not distinctly separated from the rest of periandrium and carrying some longer hairs. Mesolobus between cerci rather membraneous, also wing-shaped sclerites very pale pigmented. Telomere (Fig. 882) complicated, formed by 2 parts which are connected by unpigmented medial flat part. Fore part of telomere with an external rod-like process (very similar to that in *K. plumosula*) and an internal very finely pubescent lobe which is quite different from that of *K. plumosula*. Hind part of telomere armed by 2 robust spines and some bristles and connected by arch-shaped internal arms to intraperiandrial sclerite and mesolobus. Aedeagal complex (Fig. 881) very similar to that of *K. plumosula*, with ventrally projecting phallophore, membraneous, finely haired and apically widened distiphallus and slender, angularly bent postgonite with finger-shaped apex and some minute external setulae. Ejaculatory apodeme not observed.

Female unknown.

Discussion: The species is most closely related to *K. plumosula* (RONDANI) which is demonstrated by many similarities in the genital structures (aedeagal complex, male *S5*) but differs by pale brown gena, shorter ciliation of arista, t_2 chaetotaxy and the form of telomere. Although it has shorter ciliate arista, *K. pappi* spec. nov. cannot be conspecific with *K. glabrescens* (VILLENEUVE) because of the paler colour of the gena not mentioned in VILLENEUVE's (1917) original description. Also the dorsal chaetotaxy of t_2 of *K. pappi* spec. nov. is clearly different from that of *K. plumosula* and consequently, VILLENEUVE (1917) would have probably found these differences when comparing his *K. glabrescens* with *K. plumosula*.

Biology: Unknown.

Distribution: Jugoslavia (material examined).

Remarks: The species is dedicated to my friend Dr. LÁSZLÓ PAPP (TMB), the outstanding specialist in Acalyptratae Diptera, especially Sphaeroceridae.

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Kimosina (Kimosina) glabrescens (VILLENEUVE, 1917), comb. nov.

(Figs. 835, 875, 886–896, 914)

Leptocera (Limosina) glabrescens VILLENEUVE, 1917: 141
Limosina (Limosina) glabrescens: DUDA, 1938: 125
Limosina pteremoides PAPP, 1973a: 407, **syn. nov.**

Type material:
Leptocera (Limosina) glabrescens VILLENEUVE: Described according to 2 ♂ from Vallombrosa (Italy). Location of types unknown, probably lost (not examined).
Limosina pteremoides PAPP: Holotype ♂: Mongolia, Central aimak, 25 km O von Somon Lun, 1200 m, Dr. Z. KASZAB leg., 25. VII. 1968 (Nr. 1148) and 29 ♂ 25 ♀ paratypes from various localities from Mongolia (see PAPP, 1973a), deposited in TMB (not examined); 2 ♂ 2 ♀ paratypes (examined), now deposited in JRO: 1 ♂ Mongolia, Uvs aimak, am Fluß Baruuntu-ruun gol, neben Somon Baruunturuun, 1280 m, Dr. Z. KASZAB leg., 25. 6. 1968 (Nr. 1012); 1 ♂ Bajan-Ölgij aimak, im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagannuur, 1850 m, Dr. Z. KASZAB leg., 3. 7. 1968 (Nr. 1056); 2 ♀ data as for holotype.

Material examined (besides „Type material"): 1 ♀
Spain: 1 ♀ (ZMB) – Aragon: Albarracin (ZERNY leg.) – *Limosina glabrescens* VILLENEUVE ♀, det. DUDA.

Description:
Male. Total body length 1.70–2.05 mm (taken from PAPP, 1973a). General colour blackish brown, brown dusted. Head brown, including frons, facial cavity and gena. 3 *if* of about equal length, sometimes a short setula in front of them. 3–5 minute *ads* inside and below *ors*. *pvt* not observed. *g* rather long. Antennae brown, arista about 3.9 times as long as antenna and its ciliation of medium length (Fig. 835).

Thorax blackish brown, mesonotum sparsely, pleurae more heavily dusted. Thoracic chaetotaxy as usual in the genus; only 3 *dc* (all postsutural) and only the prescutellar long. 6 rows of *ac* hairs in front of suture; prescutellar medial *ac* pair distinctly enlarged. 2 *stpl*, the anterior represented by a minute hair-like seta. Scutellum long, triangular, with long *sc*. Legs brownish yellow to dark brown, tarsi and tibial apices paler. t_2 distinctly curved. Its dorsal chaetotaxy (Fig. 895) not distinctly different from that of *K. plumosula*. Ventral side with a double row of short spines in apical third and with a rather long *va*. Similar but very short double row of bristles also on the base of f_2. Ratio $t_2 : mt_2 = 1.68–1.77$ (according to material examined). Wing (Fig. 875) very light brownish, veins brown. Cs_1 long and sparsely haired, R_{4+5} not overpassed by *C*, slightly sinuate, as a rule less curved forward apically than in *K. plumosula*. Both pigmented processes of M_{1+2} and M_{3+4} beyond t_p of discal cell distinct. Alula small and narrow. Wing measurements (according to material examined): length 1.95–2.15 mm, width 0.77–0.87 mm, *C*-index = 1.12–1.21, $t_a – t_p : t_p = 2.53–2.75$. Halteres brown.

Abdomen brown, brownish grey dusted, dorsally sparsely but relatively long haired. *T1+2* with desclerotized medial basal area, and therefore with triangular impression in dry specimens. *S5* (Fig. 890) short, transverse, sparsely haired, with medial appendage on posterior margin consisting of biapical dark pigmented process bearing pale pigmented and finely haired posterior lobe which is bent to ventral surface of abdomen in natural position.

Genitalia. Periandrium (Figs. 888, 889) rather long but sparsely haired. Hypandrium robust. Mesolobus short, ventrally terminated by 2 characteristic and partly unpigmented sclerites, dorsally forked and forming the intraperiandrial sclerite. Cerci fused with periandrium, each with a long caudal bristle. Telomere very large, especially its fore part (Fig. 887) which has a robust anterior finger-like process and flat, finely haired posterior lobe. Hind part of telomere hidden behind the fore part, very complicated and carrying 2 spines on internal process (Fig. 889). Aedeagal complex (Fig. 886) large. Phallophore simple, distiphallus membraneous, finely haired and with a row of small cuticular tubercles on apex. Aedeagal apodeme large. Postgonite large, angularly bent, apically not pointed, with a moderate tubercle on anterior margin and some small setulae in apical fourth.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.80 to 2.05 mm (according to PAPP, 1973a). t_2 indistinctly curved, its dorsal chaetotaxy as in Fig. 896, 914; ventrally with a short *av* in apical two-fifths and a long *va*. Ratio $t_2 : mt_2 = 1.68–1.72$. Wing measurements (based on material examined): length 1.83–2.02 mm, width 0.79–0.83 mm, *C*-index = 1.18–1.24, $t_a – t_p : t_p = 2.50–2.62$.

Postabdomen (Figs. 891–893) with long haired *T6* and *T7*. *T7* with transverse stripe-shaped pigmentation similar to that of *K. longisetosa*. *T8* divided into 2 lateral plates. *T9* short, with very small dorsal bristles situated quite laterally. *S7* large, shortly haired. *S8* reduced to 2 small triangular sclerites medially connected by membrane and each carrying 2 robust, short spines. *S9* large, somewhat resembling that of *K. empirica* and characterized by a deep anterior incision, thus very different from the sickle-shaped *S9* of *K. plumosula*. Spermathecae ball-shaped, with somewhat prominent bases of spermathecal ducts (Fig. 894). Cerci separated from *T9*, each with a short, thick and pointed apical spine and some small hairs.

Discussion: *K. glabrescens* (VILLENEUVE) belongs undoubtedly to *K. plumosula* species-group having similar male genitalia but differs from related species by many details of genital and postabdominal structures. It is not as closely related to *K. plumosula* (RONDANI) as is *K. pappi* spec. nov. clearly demonstrated by the very characteristically formed female postabdomen (*S9*) and differences in the male aedeagal complex.

The species was described from Italy by VILLENEUVE (1917) from two males. Unfortunately, the types have not been traced and are apparently lost. The only available specimen from Europe is a female from Spain, determined by O. DUDA (ZMB). It agrees well with the original description and contrary to all expectation it is completely identical (including the postabdominal structures) with the female paratypes of *Limosina pteremoides* PAPP, 1973, I have examined. Therefore, *L. pteremoides* PAPP is considered to be only a synonym of *K. glabrescens* (VILLENEUVE).

PAPP (1973c, 1976a) recorded *K. glabrescens* (VILLENEUVE) from Hungary but having examined the specimens (2 ♀) I have found that both belong to *Opalimosina czernyi* (DUDA, 1918).

Biology: In Asia the species was found in high altitudes (Mongolia 1,000–1,850 m, Afghanistan 1,780–2,500 m); occurrence of the adults ranges between V and IX (PAPP,

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1973a, 1974d, 1978a — as *L. pteremoides*). In Europe, it is very rare in contradistinction to the situation in Mongolia (cf. PAPP, 1973a).

Distribution: South Europe (Spain — DUDA, 1938; Italy — VILLENEUVE, 1917), USSR: Tadzhikistan (PAPP, 1979a), Afghanistan (PAPP, 1978a), Mongolia (PAPP, 1973a, 1974d). The records from Hungary (PAPP, 1973c, 1976a) are based on misidentified specimens (see discussion).

Kimosina (Kimosina) ciliata (DUDA, 1918), **comb. nov.**

(Figs. 836, 898, 900–904)

Limosina (*Scotophilella*) *ciliata* DUDA, 1918: 129
Leptocera (*Scotophilella*) *longisetosa* var. *ciliata*: DUDA, 1925: 160 (key)
Limosina (*Limosina*) *ciliata*: DUDA, 1938: 113
Leptocera ciliata: NARTSHUK, 1970: 346 (key)
Limosina ciliata: PAPP, 1973c: 47 (key)

Type material: Syntype ♀ labelled: "Gafsa, BIRÓ, 22. III. 1903", "*ciliata* ♀ det. O. DUDA" (TMB, cf. PAPP, 1977b) (not examined); syntype ♀ labelled: "Liegnitz 1/4, 30145" and "*ciliata* m. det. DUDA" (obverse), "*longisetosa* DAHL" (reverse), deposited in ZMB (examined). It is probably erroneously labelled (see discussion). Other type specimens (1 ♂ from Biskra, BECKER leg. and 1 ♂ from Gafsa, BIRÓ leg.) mentioned by DUDA (1918) are apparently lost. The syntype from Gafsa (TMB) may be designated as lectotype if necessary.

Material examined (besides "Type material"): 1 ♀

Tunisia: 1 ♀ (TMB) — Tozeur (Hung. Nat. Hist. Exp. Tunisia leg.).

Description:

Male (according to DUDA's original description). Differs from *K. longisetosa* by completely dark frons, longer ciliation of arista and the presence of *av* in the middle of t_2. f_2 with more small anterior bristles in distal part. Genitalia without long caudal hair (this character was mentioned only by DUDA, 1938). Concerning the t_2 chaetotaxy, DUDA (1918) wrote "it has only long bristle dorsally proximally" which does not correspond with reality. It is thought that DUDA (1918) had described t_2 chaetotaxy according to a specimen with one proximal bristle broken. The further description is based on the females examined.

Female. Total body length 1.71 mm (based on syntypic female examined), general colour blackish brown, rather shiny. Head with blackish brown frons and antennae; facial cavity, frontal lunule and gena yellowish brown. 3 strong and 1 (the most anterior) very small *if*; *pvt* not observed. About 3 minute *ads* inside and below *ors*. *g* rather long. Antenna with medium long ciliate arista (Fig. 836) (distinctly longer than that of *K. longisetosa*).

Thorax with shining though pollinose mesonotum. 3 postsutural *dc*, 8 rows of *ac* microsetae between the anterior *dc*. Pleurae less shining because of denser pollination. 2 *stpl*, the anterior very small and hair-like, the posterior very long. Scutellum with 4 usual long *sc*. Legs yellowish brown, femora darker. Dorsal chaetotaxy of t_2 as in Fig. 904, ventral side with short *av* in apical two-fifths and with a long *va*. Ratio t_2: mt_2 = 1.89. Wing (Fig. 898) very pale yellowish brown, veins brownish yellow. R_{4+5} slightly sinuate, not overpassed by *C*. Cs_1 relatively shortly and densely haired compared to other *Kimosina* species. Discal cell with short coloured processes of M_{1+2} and M_{3+4}. Alula small, narrow. Wing measurements: length 1.95 mm, width 0.77 mm, *C*-index = 1.38, $t_a - t_p$: t_p = 2.50. Halteres brownish.

Abdomen brown with shiny and sparsely haired terga; sterna more densely haired. *T1+2* without desclerotized and pale pigmented medial area in comparison with *K. longisetosa*.

Postabdomen (Figs. 900–902) similar to that of *K. longisetosa* but *T6* and *T7* longer haired, *T7* without dark transverse pigmentation, *T8* completely divided into 2 lateral plates and *T9* with a pair of dorsal setae situated more medially. *S8* reduced to 2 small sclerites, each carrying 2 robust spines. *S9* of horseshoe-shaped form. Spermathecae more or less ball-shaped, with somewhat prominent bases at which the spermathecal ducts begin. Cerci in comparison with *K. longisetosa* fused with *T9* and each bearing a short, thick and blunt apical spine besides some small hairs.

Measurements of the female from Tunisia (in alcohol): total body length 2.46 mm, wing length 1.98 mm, width 0.77 mm, *C*-index = 1.24, $t_a - t_p$: t_p = 3.09, t_2: mt_2 = 1.80.

Discussion: The species seems to be allied to *K. longisetosa* (DAHL) and differs from it by the features given in the key. The most diagnostic characters are: the longer ciliation of arista, absence of caudal bristle on male cerci, female *T7* without transverse stripe-shaped pigmentation, armature of *S8* and female cerci fused with *T9*.

In my opinion, it is necessary to mention the rather particular origin of the type specimens. Among 4 syntypes on which DUDA (1918) based his description, 3 originated from North Africa and 1 ♀ from Poland. Unfortunately only 2 ♀ were preserved (see "Type material") one of which was examined here. This female syntype probably does not originate from Liegnitz (now: Poland) as its label indicates; it is thought to be a specimen collected by BECKER in North Africa (Algeria ?) from the same region as the male syntype (from Biskra) which is unfortunately lost. It was supposedly erroneously labelled by BECKER who apparently collected flies in Liegnitz at that time.

I have also some doubts if the male described by DUDA (1918) (his description is presented above) is really conspecific with the females under study. According to DUDA (1918) the male has *av* on the lower half of t_2, a feature unknown in any other species of *Kimosina*, and moreover, only one long proximal bristle dorsally on t_2 (but the second bristle might be broken as suggested above).

Besides the syntype examined, I had the opportunity to study also a female from Tunisia which was kindly compared by Dr. L. PAPP with the syntypic female of *K. ciliata*

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deposited in TMB. It is also found to be conspecific with the above syntype. Unfortunately, the male recorded by PAPP (1977b) from Tunisia is lost. VANSCHUYTBROECK's (1951) record from the Zaire (Belgian Congo — Thysville, XI. 1935, J. GHESQUIERE leg., deposited in IRB) is based on 4 misidentified females all of which are *Spelobia bifrons* (STENHAMMAR).

Biology: Almost nothing is known about the biology of this species. The female from Tunisia was netted from straw, debris and excrement in an open cattle barn (see PAPP, 1977b). Another female mentioned by PAPP (1977b) was netted from weedy vegetation along tracks and ditch borders; both specimens were caught in IV. The syntypic female from Tunisia was taken in III (PAPP, 1977b).

Distribution: Hitherto only in North Africa: Tunisia (DUDA, 1918, 1938; PAPP, 1977b), Algeria (DUDA, 1918). The specimen from Poland (DUDA, 1918) is probably mislabelled and the occurrence of this species in Central Europe is rather improbable. Also VANSCHUYTBROECK's (1951) record from Belgian Congo is erroneous, see discussion.

Kimosina (Kimosina) longisetosa (DAHL, 1909), **comb. nov.**

(Figs. 837, 899, 905–913, 916)

Limosina longisetosa DAHL, 1909: 370 (key); PAPP, 1973c: 48 (key)
Limosina (Scotophilella) longisetosa: DUDA, 1918: 127
Leptocera (Scotophilella) longisetosa: DUDA, 1925: 156, 160 (key)
Leptocera (Limosina) longisetosa: RICHARDS, 1930: 300
Leptocera longisetosa: SÉGUY, 1934: 467; NARTSHUK, 1970: 346 (key)
Limosina (Limosina) longisetosa: DUDA, 1938: 130

Type material: Holotype ♀ labelled: "Zool. Mus. Berlin, F.: Grunewaldfenn, Torfmoos . . . ., 8. 4. 08, S.: DAHL 1570 II, J. N., E. K. M." The specimen (preserved in alcohol) is in bad condition, very faded; all right legs, mid left leg, right wing and postabdomen on a slide labelled: "*Limosina longisetosa* F. DAHL" and "DAHL 1570 II" (ZMB, examined).

Material examined (besides "Type material"): 8 ♂ 20 ♀

GB: 1 ♂ 2 ♀ (UMO) — England: Kimbers (HAMM leg.), Wicken, Chippenham (VERRALL leg.).

GDR: 1 ♂ (ZMB) — without locality (DUDA leg.).

Poland: 1 ♀ (ZMB) — Wustung b. Habelschwerdt (DUDA leg.).

Czechoslovakia: 4 ♀ (JRO, MMB, JZP) — Bohemia: Doupovské hory Mts.-Doupov (ROHÁČEK leg.), Skryje nr. Rakovník (BENEŠ leg.); Moravia: Brno-Černovice (CZIŽEK leg.); Slovakia: Patince nr. Komárno (ROHÁČEK leg.).

Austria: 1 ♂ 1 ♀ (TMB, NMA) — F. J. Land nr. Wien (without collector); Steiermark: Admont (STROBL leg.).

Hungary: 3 ♀ (TMB) — Budajenö rét (HORVATOVICH leg.).

Bulgaria: 1 ♂ (IZS) — Plana (BESHOVSKI leg.).

Denmark: 1 ♂ 2 ♀ (ZMK) — F: Arreskov sø (KRISTENSEN leg.); NEZ: Ordrup Mose (LUNDBECK leg.), Geel Skov (MORTENSEN leg.).

Sweden: 2 ♀ (ZIU) — without locality (STENHAMMAR leg.).

Finland: 3 ♂ 5 ♀ (ZMH) — N: Helsinge (HELLÉN leg.), Hoplax (FREY leg.), Tvärmine (HACKMAN, FREY leg.), Borgå (HACKMAN leg.); Oa: Malax (LINDBERG leg.); ObS: Hailuoto (FREY leg.).

Description:

Male. Total body length 1.65–1.79 mm. General colour blackish brown, moderately brown dusted. Head with brown and dusted posterior part of frons, the anterior part yellowish brown. Frontal triangle shining, not dusted. Orbits silvery grey pollinose. 3–4 *if*, the most anterior and posterior smaller. 3–5 small *ads* inside *ors*. *pvt* very small, hair-like, indistinct. Frontal lunule, facial cavity and gena yellow and yellowish white dusted. *g* rather long. Antennae brown, third antennal segment shortly ciliate as is arista (Fig. 837).

Thorax brownish black, brown dusted, rather shining. Mesonotal chaetotaxy typical for the subgenus. 3 *dc*, all behind suture. 6 rows of *ac* microsetae between anterior *dc*, the prescutellar medial *ac* pair distinctly enlarged, as long as the anterior *dc*. Pleurae more dusted, dull. 2 *stpl*, the anterior minute, the posterior very long. Scutellum long, with long *sc*. Legs yellow to yellowish brown. t_2 distinctly curved, its dorsal chaetotaxy as in Fig. 916 but all bristles generally shorter. Ventral chaetotaxy — in apical two-fifths double row of short spines, terminated by moderate *va*. A similar double cluster of short bristles on base of f_2. Ratio t_2: mt_2 = 1.74–1.94. Wing (Fig. 899) light yellowish brown, with brownish yellow veins. Cs_1 long and sparsely haired. *C* not extended beyond R_{4+5}, the latter very slightly sinuate. Discal cell rather short. Alula small and narrow. Wing measurements: length 1.47–1.76 mm, width 0.64–0.75 mm, *C*-index = 0.95–0.98, t_a–t_p: t_p = 1.72–2.08. Halteres yellow.

Abdomen brownish black, brown dusted, dorsally shortly and sparsely haired. *T1+2* medially with triangular pale pigmented and weakly sclerotized area. Sterna more densely haired. *S5* (Fig. 909) rather short and wide, laterally and on posterior margin with long bristles, otherwise bare. Medial tongue-shaped process on hind margin in natural position protruding ventrally.

Genitalia. Periandrium (Figs. 907, 908) not very large, sparsely but rather long haired, especially round the anal fissure. Cerci produced ventrally, apically flat and very pale, basally each bearing a long caudal bristle. Mesolobus simple, dorsal internal arch-shaped arms of intraperiandrial sclerite bent ventrally and terminated by fusion with complicated and characteristically bristled hind part of telomeres (Fig. 908). Telomere rather large, bipartite. Its fore part (Fig. 906) with ventrally bristled anterior lobe and large, flat posterior lobe. Aedeagal complex (Fig. 905). Phallophore short, ventrally producing in a small process. Distiphallus membraneous and very finely haired. Postgonite large, S-shaped, externally with some small setulae in apical third.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.70 to 1.95 mm. t_2 very slightly curved, all bristles generally longer (Fig. 916), ventrally with a short *av* in apical two-fifths and with a long *va*. Ratio t_2: mt_2 = 1.75–1.95. Wing measurements: length 1.79–1.91 mm, width 0.79–0.83 mm, *C*-index = 1.02–1.17, t_a–t_p : t_p = 2.06–2.38.

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Postabdomen (Figs. 910–912). *T7* with transverse, stripe-shaped pigmentation similar to that of *K. glabrescens*. *T8* medially membraneous but not completely divided into lateral plates. *T9* short, with a pair of small dorsal setae. *S8* reduced to 2 small sclerites each bearing 2 small bristles. *S9* consisting of sickle-shaped sclerite and pale, oblong, ill-defined plate in front of it. Spermathecae (Fig. 913) shortly oval to globular, with short sclerotized parts of ducts. Cerci not fused with *T9*, each carrying a thick, short apical spine and some small hairs.

Discussion: The most closely allied species to *K. longisetosa* (DAHL) in the Palaearctic Region seems to be *K. ciliata* (DUDA). This species exhibits a rather close affinity not only in external body characters but also in the structure of the female postabdomen (for difference see discussion under *K. ciliata*). Unfortunately no male of *K. ciliata* was available for examination of the genitalia which would make it possible to elucidate the degree of relationship of these species.

The specimens recorded under *Limosina longisetosa* from Australia (DUDA, 1925; RICHARDS, 1973) represent a different species which will be described in a subsequent paper.

Biology: The species has been caught in damp meadows (DUDA, 1938) and deciduous woods (COE, 1962a), often in grass and under cut sedge (RICHARDS, 1930), in rabbit and vole burrows (RICHARDS, 1930) or in mole nests (SÉGUY, 1934). I have collected 1 ♀ in runs of *Arvicola terrestris* and 1 ♀ in nest of *Microtus* spec. Only accidentally on horse dung (RICHARDS, 1930). Adults were recorded from almost all the months (RICHARDS, 1930; PAPP, 1973c) but are generally rare.

Distribution: Europe but also Siberia (DUDA, 1938). In Europe recorded positively from Spain (DUDA, 1918), France (SÉGUY, 1934); GB: England, Scotland (RICHARDS, 1930, 1976), GDR (DAHL, 1909; DUDA, 1918, 1938); Poland (DUDA, 1918, 1938), Czechoslovakia (DUDA, 1918; CZIŽEK, 1925; ROHÁČEK, 1978b), Austria (DUDA, 1918), Hungary (PAPP, 1973c), Jugoslavia (COE, 1962a), Bulgaria, Denmark, Sweden, Finland (material examined, new), USSR: Estonia, Latvia (HACKMAN, 1972; PAPP, 1979a).

14. Genus *Telomerina* gen. nov.

Group of *L. minutissima* ZETTERSTEDT: RICHARDS, 1930: 296 (part.)
Type species: *Borborus flavipes* MEIGEN, 1830

Diagnosis: The genus can be characterized as follows.

(1) *pvt* well developed
(2) 3–5 short *if* of about equal length
(3) *ads* arranged in a long row running on orbit and face (Fig. 917)
(4) *g* of medium length
(5) eye mostly small and flat; head short and high, carina strongly protruding between antennae
(6) antennae strongly divergent, almost opposite
(7) thorax heavily dusted, dull; mesonotum somewhat opalescent
(8) 1 long (external) *hu*, 2 small internal microsetae
(9) 2 *dc*, the anterior short
(10) 6 rows of *ac* microsetae, the medial prescutellar *ac* pair often enlarged
(11) scutellum comparatively large, roundly triangular to trapezoidal
(12) 2 *stpl*, the anterior small
(13) t_2 chaetotaxy (Figs. 963–968) dorsally relatively constant; *av* regularly present in female, and may be replaced by a short spines in male (*T. antonini* spec. nov., *T. pseudoleucoptera*)
(14) wings more or less sexually dimorphic (Figs. 951, 952), in female narrower and somewhat tapering distally
(15) *C* extended beyond R_{4+5}
(16) R_{4+5} straight, somewhat bent or very slightly sinuate
(17) discal cell long, often very narrow, with appendages of M_{1+2} and M_{3+4} beyond t_p
(18) alula small, narrow, pointed
(19) female postabdomen short and basally as wide as preabdomen
(20) male *S5* with membraneous medial posterior area and often 2 posterior flat appendages

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(21) periandrium simply haired, with reduced cerci which are not medially connected by subanal plate; also intraperiandrial sclerite absent. Each cercus with a long ventrocaudal hair
(22) hypandrium large, long
(23) telomere very long, slender, with long hair-like setae
(24) phallophore flat, its shape of a horizontally situated frame between the reduced cerci below anal fissure
(25) distiphallus very simple, composed of dorsal and smaller (may also be absent) ventral sclerite, otherwise membraneous
(26) postgonite long, slender and anteriorly, mainly in distal part very finely pubescent
(27) ejaculatory apodeme either minute or completely absent
(28) female preabdominal sclerites, *T6* and *S6* paler pigmented than the remaining postabdomen; *T6* distinctly narrower than *T7*
(29) female *T8* medially shortened and often pale pigmented, laterally strongly extended
(30) female *T9* small, with 2 usual dorsal setulae
(31) female *S8* large, somewhat tapering posteriorly and bearing 2 long ventrolateral bristles
(32) female *S9* of complex form, with various desclerotized areas, apertures, connecting stripes etc.
(33) spermathecae (except for *T. antonini*) with characteristic, slender, apically pointed and often curved terminal projection
(34) cerci short, robust, each with 2 thick (dorsopreapical and apical) sinuate to spine-like setae.

Discussion: The genus *Telomerina* gen. nov. resembles in its outer body characters some groups of the genus *Opalimosina*, e.g. subgenus *Pappiella*. *T. antonini* spec. nov. in particular possesses some plesiomorphic characters (not found in other *Telomerina* species — for example the wing venation with strongly curved R_{2+3} and slightly curved R_{4+5}, simple spermathecae) which as well as t_2 chaetotaxy of all *Telomerina* indicate that the above genera might have had a common ancestor. The large epiphallus of *Opalimosina* (*Pappiella*) might have evolved from a simple broad phallophore like that of *Telomerina* and its long, sinuously margined postgonite might have developed from a more primitive state similar to the postgonite of some *Telomerina* species. However, both *Telomerina* and *Opalimosina* now appear to be too advanced and aberrant groups lacking clear shared features and it is difficult to demonstrate their relationship (see the chapter "Phylogeny").

Telomerina gen. nov. is characterized by several obvious autapomorphies — the numerous *ads*, slight sexual wing dimorphism, periandrium without subanal plate and intraperiandrial sclerite between cerci, very long telomere, finely pubescent postgonite, reduced female *T6*, complicated *S9* and spermathecae with terminal projection (except for *T. antonini* spec. nov.).

The genus includes 7 Palaearctic species, 5 of which are found in Europe: *T. antonini* spec. nov., *T. ursina* spec. nov., *T. eburnea* spec. nov., *T. flavipes* (MEIGEN, 1830) and *T. pseudoleucoptera* (DUDA, 1924). Two further species were described from Mongolia — *T. paraflavipes* (PAPP, 1973) comb. nov. and *T. kaszabi* (PAPP, 1973) comb. nov. Two Nearctic species — *T. gracilipennis* (SPULER, 1925) and *T. cellularis* (SPULER, 1925) comb. nov. and *T. fusca* (DUDA, 1925) comb. nov. from Paraguay without doubt also belong here.

Key to European species

1 R_{2+3} apically strongly curved up to *C* (Fig. 918). Male f_2 ventrally with a row of curved bristles (Fig. 930). Male *S5* (Fig. 923) with a knob-like projection in front of posterior pale area. Female *T6* and *T7* armed by thick bristles on posterior margin. Spermathecae without terminal projection. Male genitalia (Figs. 919—922), female postabdomen (Figs. 924—926) . . . . ***T. antonini* spec. nov.**

— R_{2+3} very slightly bent to *C*. Male f_2 simple. Male *S5* and genitalia different. Female *T6* and *T7* with thin bristles, spermathecae with slender, pointed terminal projection 2

DOI: 10.21248/contrib.entomol.33.1.3-195

2(1) Eye larger, its diameter more than 2.2 times as long as the narrowest genal width. Male *S5* as in Fig. 942, telomere apically with 2 robust short spines (Fig. 936), aedeagal complex as in Fig. 935. Female postabdomen and spermathecae (Figs. 939–941, 943) . . . . . ***T. ursina* spec. nov.**

— Eye smaller, its diameter less than twice as long as the narrowest genal width. Male telomere apically without robust short spines. Male and female terminalia different 3

3(2) Wing pale but distinctly brownish, veins yellowish brown. R_{4+5} not perfectly straight. Cs_2 more or less distinctly incrassate (Fig. 969). Male *S5* as in Fig. 979, telomere terminally forked (Fig. 971), postgonite with enlarged rounded apex (Fig. 970). Female *S7* wider than *S6*, *S8* with distinctive pigmentation (Fig. 977), spermathecae with twisted terminal projection (Fig. 978) . . . . . *T. pseudoleucoptera* (DUDA)

— Wing whitish, veins (except for *C*) hyaline and colourless. R_{4+5} straight. Cs_2 less distinctly thickened. Male *S5* and genitalia different. Female *S7* narrower than *S6*, *S8* with simple pigmentation, at most with paler anterior or posterior area, spermathecae with less curved terminal projection 4

4(3) Wing strikingly white, *C* pale yellowish brown. Female *T6* wider and shorter (Fig. 945), *S7* with a transverse dark pigmented stripe, *S9* narrower (Fig. 947), spermathecae (Fig. 948) with extremely long and slender terminal projection and with finely tuberculate body; cerci each with 2 thick but sinuate setae. Male unknown . . . . . ***T. eburnea* spec. nov.**

— Wing rather greyish whitish, *C* dark brown to black in Cs_2. Male *S5* (Fig. 958), telomere pointed and richly haired (Fig. 954), postgonite slender and apically pointed (Fig. 953). Female *T6* narrower and longer (Fig. 959), *S7* simply pigmented, *S9* wider (Fig. 961); spermathecae with shorter terminal projection and simple body surface; cerci each with 2 thick, short, slightly curved spines . . . . . *T. flavipes* (MEIGEN)

Telomerina antonini spec. nov.

(Figs. 918–930)

Type material: Holotype ♂: Czechoslovakia: Moravia, Řásná nr. Telč, 8. 9. 1978, sifting Sphagnum, J. ROHÁČEK leg.; genitalia dissected and preserved in a plastic tube in glycerine, pinned below specimen (JRO). Allotype ♀ Moravia, Třešť-Loučky, 3. 9. 1974, on human faeces in wood, J. ROHÁČEK leg. (JRO). Paratypes: 1 ♂ Moravia, H. Jeseník Mts., peat-bog Rejvíz, 12. 9. 1979, on decayed fungi; 1 ♀ dtto, peat-bog Skřítek, 30. 8. 1977, on decayed fungi; 1 ♂ Slovakia, Kremnické pohorie Mts., Turček env., 24. 6. 1979, on bear excrement, all J. ROHÁČEK leg. (SMO).

Description:

Male. Total body length 1.42–1.55 mm, general colour brownish black, heavily dusted, dull. Head brownish black. Frons brownish black, only anterior margin somewhat paler brown, dark greyish brown dusted, only a narrow frontal triangle and ocellar triangle shining. Orbits and interfrontalia narrowly silvery dusted. *pvt* well developed, almost as long as *occi*. 4–5 *if* of about equal length or becoming somewhat shorter anteriorly; *ads* in a long row, arranged as in *T. flavipes* but somewhat thiner and less numerous. Facial cavity and the strongly protruding carina blackish brown, shining. Frontal lunule black, dusted, dull. Face and gena relatively broad, the hairs round the anteroventral margin of eye well developed; *g* very thin but comparatively long. Eye small, flat, its diameter about 1.7 times the smallest genal width. Antennae blackish brown, 3rd segment paler brown. Arista about 3.2 times as long as antenna, of medium length but densely ciliate.

Thorax brownish black, densely greyish brown dusted, mesonotum somewhat opalescent, pleurae completely dull. Humeral callus with a long external *hu* and 2 minute internal hairs. 2 *dc* but the anterior very short; 6 rows of *ac* hairs in front of suture, the medial prescutellar *ac* pair hardly enlarged. Scutellum rather long, roundly triangular; *sc* thin, of medium length. Pleurae with yellowish brown sutures between pleural sclerites; 2 *stpl*, the anterior minute and hair-like, the posterior comparatively weak. Legs brown, fore coxa, trochanters and tarsi (partly) pale yellowish brown. f_2 basally with a very distinctive row of *pv* bristles. t_2 chaetotaxy as in Fig. 930, ventrally with a long row of short, stout and black spines and a very reduced *va*. Ratio t_2: $mt_2 = 1.76–1.92$. Wing (Fig. 918) with very pale brownish membrane, veins except for *C* pale brown. *C* dark brown to black, extended very far past R_{4+5}. R_{2+3} apically strongly curved to *C*. R_{4+5} slightly bent. Discal cell not very long but large, broad, with anterior outer corner acute-angled, posterior obtuse-angled, both with usually distinct appendages of M_{1+2} and M_{3+4} beyond t_p. M_{1+2} apically continued by colourless fold. Alula small, narrow and pointed. Wing measurements: length 1.45–1.56 mm, width 0.63–0.66 mm, *C*-index = 0.87–0.94, t_a–t_p: t_p = 1.67 to 2.08. Halteres with blackish knob and yellowish brown stem.

Abdomen dark brown, dark grey pollinose, very little shiny. Preabdomen paler pigmented and rather weakly sclerotized in comparison with postabdomen. Terga sparsely haired but hairs on posterior margin of *T4* and *T5* rather strong. *T1+2* long, with a pale pigmented medial basal area. Sterna more densely but shortly haired. *S5* (Fig. 923) large and peculiar, posteromedially with membraneous, densely pale spinulate area terminated by 2 posterior flat appendages. Medially, in front of this area a striking knob-like projection composed of small cuticular excrescences.

Genitalia. Periandrium (Figs. 921, 922) uniformly haired but lateral bristles at lower margin somewhat stouter and longer. Cerci reduced and fused with periandrium but forming ventral projections separated from periandrium by deep posteroventral cavities. Each cercus carries a long hair-like bristle and 2 shorter setae. Subanal plate between cerci absent but both lateral parts of periandrium connected by very narrow stripe below anal opening. Intraperiandrial sclerite reduced to 2 minute sclerites in contact with the phallophore. Hypandrium longer than in related species. Telomere (Fig. 920) long, slender as in *T. flavipes* but differently shaped and posteriorly with only 3 long hair-like bristles. Aedeagal complex (Fig. 919)

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simple, larger than that of *T. flavipes*. Phallophore robust, flat, broad, almost as long as the distiphallus; the latter composed of a simple dorsal sclerite, minute ventral sclerite and large membraneous part. Postgonite different from that of related species, much shorter, thicker, with ciliate anterior margin and some minute setulae on outer side. Ejaculatory apodeme present but minute.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.50 to 1.61 mm. t_2 chaetotaxy (Figs. 927, 928) different from that of male — ventrally with a distinct *av* in lower half and *va* well developed. f_2 ventrally simply haired, without specialized row of spines. Ratio t_2: $mt_2 = 1.71-1.79$. In allotype t_p is partly lost (aberrant specimen). Wing measurements: length 1.55—1.71 mm, width 0.68—0.71 mm, *C*-index = 0.89—0.94, $t_a-t_p : t_p = 1.87-2.08$. Abdomen as in male but preabdominal terga more densely haired and paler pigmented.

Postabdomen (Figs. 924—926). *T6* narrower and paler than *T7*, which is extended laterally and medially has a prolonged, pale pigmented posterior margin. Both these terga with conspicuous, robust, semi-erect spine-like bristles. *T8* medially shortened and with pale pigmented stripe; its lateral parts strongly extended. *T9* comparatively long, medially pale pigmented and carrying 2 dorsal setulae. *S6* simple, pale pigmented and densely haired. *S7* darkly pigmented, especially anteriorly. *S8* large, long, convex, with small, oval, depigmented area medially and with 2 long ventral bristles. *S9* differing from that of related species in having only a very small transverse aperture in the middle and a deep anterior incision being separated from the above aperture by small stripe. Spermathecae (Fig. 929) also different, simple egg-shaped, with short, pale pigmented terminal parts of ducts. Cerci short, each with 2 relatively long and very slightly sinuate bristles besides some short curved hairs.

Discussion: The species is the most aberrant species of Palaearctic *Telomerina* readily recognizable by its strongly upcurving R_{2+3}, male f_2 ventrally with a row of curved bristles, conspicuously bristled female *T6* and *T7*, peculiar male *S5*, periandrium and aedeagal complex, simple spermathecae etc. In the formation of its wing, the species resembles some *Opalimosina* species, especially *O.* (*Pappiella*) *liliputana* (RONDANI) but this similarity is only superficial as principal differences can be found in the structure of male and female terminalia.

Biology: Type specimens were collected on human and bear excrement, decaying fungi and sifted from Sphagnum, but almost always on peat-bogs or in the vicinity of peat-bog meadows, at 600—850 m above sea level. Adults were caught in VI, VIII, IX.

Distribution: Czechoslovakia.

Remarks: The species is named in honour of my late father, ANTONÍN ROHÁČEK, who died in 1977 before the completion of this work, which was of particular interest to him.

Telomerina ursina spec. nov.

(Figs. 931—943)

Type material: Holotype ♂: Czechoslovakia, Slovakia, Kremnické pohorie Mts., Turček env., 850 m, 27. 6. 1979, on bear excrement, J. ROHÁČEK leg. (SMO). Allotype ♀ and 4 ♂ 8 ♀ with same data as for holotype (SMO, 3 ♂ 2 ♀ paratypes in JRO). Further paratypes with same data as the holotype but collected in different dates: 1 ♀ 24. 6., 2 ♂ 25. 6., 4 ♂ 5 ♀ 26. 6. and 7 ♂ 2 ♀ 28. 6. 1979; 1 ♂ 1 ♀ paratypes with same data but collected 23. 6. 1979 on decayed fungi (1 ♂ 1 ♀ in UMO, 1 ♂ 1 ♀ in BML, other paratypes in SMO).

Description:

Male. Total body length 1.01—1.23 mm, general colour brownish black, greyish brown dusted, dull. Head blackish brown. Frons entirely dark brown dusted and dull, only frontal and ocellar triangle somewhat shining. Interfrontalia and orbits very narrowly, almost indistinct, greyish pollinose. Cephalic bristles small; *prt* distinctly developed and almost crossing; 3—4 small *if* of equal length or the most anterior shorter; *ads* as in related species, in a long row running round the anterior margin of eye. Frontal lunule blackish brown or black, rather long. Face and gena brown, narrower than in related species in consequence of larger eye. Facial cavity blackish and shiny, carina very distinctly protruding between antennal bases. Eye larger than in all related species, its diameter about 2.3—2.4 times as long as the smallest genal width. *g* comparatively small but distinct. Antennae brown, 2 basal segments darker. Arista about 3.1 times as long as antenna, rather shortly or mediumly long ciliate.

Thorax brownish black, greyish brown dusted. Mesonotum opalescent, the rest of thorax entirely dull. 1 long external *hu* and 2 small microsetae on humeral callus. 2 *dc*, the anterior short; *ac* microsetae in 6 rows between anterior *dc*; prescutellar medial *ac* pair a little enlarged. Scutellum relatively short, roundly trapezoidal, with short *sc* (the apical hardly longer than the scutellum). Pleurae with yellowish brown sutures between sclerites. 2 *stpl*, the anterior reduced to a hardly discernible microseta. Legs brown, fore coxa, trochanters, knees and tarsi paler. t_2 chaetotaxy as in Fig. 933, *av* in the middle of t_2 present but short as is also *va*. f_2 ventrally simply haired. Ratio t_2: $mt_2 = 1.89-2.10$. Wing comparatively broad (Fig. 934), with pale, somewhat whitish grey membrane; also veins very pale, hyaline or light brownish, only *C* distinctly brownish and extending beyond R_{4+5}. R_{2+3} apically very slightly curved; R_{4+5} more or less straight, only apically a little curved up to *C*. Discal cell large but comparatively broad, its outer corners with appendages of M_{1+2} and M_{3+4} beyond t_p, the latter usually longer. Alula small, narrow, pointed. Wing measurements: length 1.03—1.23 mm, width 0.50—0.55 mm, *C*-index = 0.78 to 0.98, $t_a-t_p : t_p = 2.27-2.78$. Halteres yellowish brown, with dark brown knob.

Abdomen blackish brown, greyish brown dusted, subshining, somewhat opalescent. Preabdominal sclerites rather weakly sclerotized. *T1+2* with paler pigmented medial basal area. Terga sparsely and shortly, sterna more densely haired. *S5* (Fig. 942) similar to that of *T. flavipes* but comparatively shorter, wider, posteromedially more incised and with smaller and differently haired pale area. Posterior appendages less distinctly differentiated, shorter and wider, very finely densely haired.

Genitalia. Periandrium (Figs. 937, 938) similar to that of *T. flavipes* but much more sparsely haired. Cerci fused with periandrium, each with a long ventrocaudal hair-like bristle and some shorter setae. Subanal plate and intraperiandrial sclerite not developed. Hypandrium long and robust as in related species. Telomere (Fig. 936) long, slender, apically tapering, with long hairs only anteriorly and apically with 2 short (anteropreapical and apicoexternal) very thick curved spines. Aedeagal complex (Fig. 935) large, especially the postgonites which project posteroventrally and are visible even in dry specimens. Phallophore broad, flat and functionally replacing the subanal plate between cerci. Distiphallus simple, composed of dorsal sclerite and ventral membraneous part dotted with conspicuous thorny grains. Postgonite very large, S-shaped, apically flattened and rounded, with finely haired anterior margin and some minute setulae on outer side. Ejaculatory apodeme not found.

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Female. Similar to male but differs as follows. Total body length 1.15–1.52 mm. t_2 with longer bristles (Figs. 931, 932), especially *av* below middle and *va*. Ratio t_2: mt_2 = 2.00–2.16. Wing usually longer compared to its width. Wing measurements: length 1.12–1.37 mm, width 0.49–0.58 mm, *C*-index = 0.86–1.02, t_a–t_p: t_p = 2.18–3.25. Preabdomen as in male.

Postabdomen (Figs. 939–941). *T6* and *S6* paler pigmented (similarly as preabdominal sclerites) than the next sclerites. *T6* distinctly narrower than *T7*, latter sparsely haired and dark pigmented. *T8* laterally extended, medially incised and very short but not divided or pale pigmented. *T9* comparatively short, basally with 2 lateral darker pigmented spots, dorsally with a pair of small setulae. *S6* narrower than *S7*. *S7* large, broad, heavily sclerotized and darkly pigmented. *S8* large, long, posteromedially with triangular membraneous and pale pigmented area and posterolaterally with a long bristle on each side. *S9* of complex form, composed of 3 laterally connected stripes. Spermathecae (Fig. 943) similar to those of *T. flavipes* but their projections somewhat longer and differently curved. Cerci short, each with 2 longer (dorsopreapical and apical) very slightly sinuate setae and 3 shorter (2 curved lateral and 1 weak ventropreapical) hairs.

Discussion: The species is most closely allied to *T. flavipes* (MEIGEN) and especially *T. eburnea* spec. nov., having generally similar outer characteristics, but it can be separated from them by its smaller size, larger eyes, shorter and wider wings, different armature of the male *S5*, telomere with 2 apical thick, short spines and without long hairs posteriorly, large postgonites with rounded apex, female *S7* wider than *S6* and different female *S9*. In its comparatively large eyes it clearly differs from all Palaearctic congeners.

Biology: Apart from 2 specimens caught on decayed fungi, all the type material (35 specimens) was collected on bear excrement. It is interesting that the species was, together with *Opalimosina liliputana*, dominant among the sphaerocerid fauna on 4–6 days old bear excrement but wholly absent on fresh excrement. The species has apparently a strong affinity to necrophagy, as have the related species of *Telomerina*, because it was found on the excrement of carnivore (the bear was clearly predominantly carnivorous at that time) and also on decaying fungi, but not on red deer droppings or human excrement.

Distribution: Czechoslovakia (Slovakia).

Telomerina eburnea spec. nov.

(Figs. 944–950)

Type material: Holotype ♀: Czechoslovakia, Moravia, Studenec, 8. 4. 1962, R. ROZKOŠNÝ leg. (JRO); abdomen detached and preserved in a plastic tube with glycerine, pinned below specimen. Paratypes: 1 ♀ Denmark, EJ: Anhold (St. 273), paa dod fügel, SÖDGAARD ANDERSEN leg.; 1 ♀ Denmark, NEZ: Utterslev Mose, 4/87, R. W. SCHLICK leg. (ZMK).

Description:

Male unknown. Female. Total body length 1.32–1.67 mm, general colour brown to dark brown, dusted and dull. Head brown to blackish brown. Frons dull, brown dusted, also frontal triangle only slightly shiny; interfrontalia very narrowly silvery grey dusted; sparse silvery pollination on orbits and ocellar triangle. *pvt* small; 4–5 short *if* of about equal length; *ads* in a long row round the eye (as in *T. flavipes*). Frontal lunule, face and gena greyish brown dusted, dull. Facial cavity shining brown, carina strongly protruding between antennae. *g* of medium length. Eye small, its diameter about 1.8–1.9 times the smallest genal width. Antennae strongly divergent, with brown 3rd segment, basal segments blackish. Arista about 3.6 times as long as antenna, comparatively long and densely ciliate.

Thorax dark brown, greyish brown dusted. Mesonotum opalescent, pleurae dull. 2 *dc*, the anterior short. 6 rows of *ac* microsetae, the medial prescutellar *ac* pair enlarged, as long as the anterior *dc*. Scutellum roundly triangular, *sc* long. Pleurae with yellowish sutures between pleural sclerites. 2 *stpl*, the anterior minute. Legs pale brown, especially trochanters and tarsi pale. t_2 chaetotaxy similar as in *T. flavipes* but *pd* longer (Figs. 949, 950). Ratio t_2: mt_2 = 2.16–2.32. Wing (Fig. 944) with conspicuously white membrane, veins hyaline white, only *C* very pale yellowish brown and extending far beyond R_{4+5}. R_{2+3} very slightly curved apically; R_{4+5} straight. Discal cell relatively long, both outer corners with appendages of M_{1+2} and M_{3+4} beyond t_p. Alula small, narrow, pointed. Wing measurements: length 1.36–1.58 mm, width 0.54–0.66 mm, *C*-index = 0.96–0.98, t_a–t_p : t_p = 2.88–3.50. Halteres yellowish brown, stem paler yellow.

Abdomen brown, dusted, slightly shiny to dull. Preabdominal terga sparsely haired. *T1+2* large, with desclerotized and pale pigmented basal medial area. Sterna densely shortly haired. Preabdominal sclerites and those of 6th segment weakly sclerotized compared to remaining postabdominal sclerites.

Postabdomen (Fig. 945–947). *T6* narrower than *T7* but generally wider than that of *T. flavipes*. *T7* short, wide, darkly pigmented. *T8* medially shortened, with membraneous pale pigmented stripe, laterally very extended as in other *Telomerina* species. *T9* essentially shorter than in *T. flavipes*, medially pale pigmented, dorsally with 2 usual setae. *S6* as wide as or slightly wider than *S7*, latter with distinctive transverse band-like pigmentation (as in *T. pseudoleucoptera*). *S8* large, convex, anteriorly with indefinite paler pigmented area, laterally with a long ventral bristle on each side. *S9* smaller (narrower) than that of *T. flavipes*, laterally heavily sclerotized and dark, medially with large, transverse, membraneous area and anteriorly with a narrow stripe connecting its anterior corners. Spermathecae (Fig. 948) large and very distinctive, each with finely tuberculate basal oval part and long, curved terminal projections (longer than half the length of spermatheca). Sclerotized parts of ducts of medium length, rather pale pigmented. Cerci short, each with 2 robust but sinuate bristles, the dorsopreapical is slightly longer (but thicker) than half the apical one; otherwise with 2 short, curved, lateral and 1 straight ventropreapical hair.

Preimaginal stages: Two puparia were glued with type specimens. Both are slightly damaged but allow at least brief description. General colour golden-yellowish brown. Length 2.22–2.30 mm, maximum width 0.67–0.71 mm. Segmentation relatively distinct. Anterior spiracular process spine-like but short (length 0.06 mm), black, with about 6 pale, shor papillae. Posterior spiracular projection conical, not very long. The last 2 segments medially and between posterior spiracular projections with a rather deep longitudinal dorsal groove. The puparium resembles that of *Opalimosina liliputana* but differs in having shorter anterior spiracular process with shorter papillae as well as shorter posterior projection.

Discussion: The species is the closest relative of *T. flavipes* (MEIGEN) having very similar external body features but differing in the strikingly pale wing with pale *C*, paler halteres, t_2 with stronger *pd* in apical fifth and especially by features of the female post-

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abdomen (wider *T6*, smaller and shorter *T9*, *S7* with transverse, darkly pigmented stripe, narrower and different *S9*, finely tuberculate spermathecae with extremely long, slender terminal projection, cerci with robust sinuate bristles). *T. ursina* spec. nov. and *T. antonini* spec. nov. resemble *T. eburnea* spec. nov. in the armature of female cerci, but both differ by other distinctive characters (see key). Unfortunately the male of this species is unknown, but the species is distinct and is therefore described as new.

Biology: Hitherto unknown. Two specimens (including holotype) were bred from puparium in IV; one female was taken from a dead bird. The species is probably necrophagous as is its closest cogener *T. flavipes*.

Distribution: Denmark, Czechoslovakia.

Telomerina flavipes (MEIGEN, 1830), **comb. nov.**

(Figs. 917, 951–965)

Borborus flavipes MEIGEN, 1830: 208
Limosina (*Limosina*) *flavipes*: DUDA, 1938: 122
Leptocera (*Limosina*) *flavipes*: HARRISON, 1959: 269; RICHARDS, 1973, 372
Leptocera flavipes: NARTSHUK, 1970: 349 (key)
Limosina flavipes: PAPP, 1973c: 55 (key)
Limosina minutissima ZETTERSTEDT, 1847: 2505; STENHAMMAR, 1854: 420
Leptocera (*Limosina*) *minutissima*: RICHARDS, 1930: 296
Leptocera minutissima: SÉGUY, 1934: 467
Limosina retracta RONDANI, 1880: 25
Limosina (*Scotophilella*) *retracta*: DUDA, 1918: 140
Leptocera (*Scotophilella*) *retracta*: DUDA, 1925: 161 (key)
? *Limosina* (*Limosina*) *ventruosella* VENTURI, 1965: 7

Type material:
Borborus flavipes MEIGEN: Lectotype ♀ (des. by ROHÁČEK in 1978) labelled: "*flavipes* Coll. WINTH.", "*flavipes*" (? MEIGEN's handwriting) and "*retracta*, det. DUDA". The specimen is rather immature but well preserved (NMW).
Limosina minutissima ZETTERSTEDT: All 4 preserved syntypes (ZIL) (cf. KIM, 1972) have been examined. Unfortunately, none of them correspond with the original description — 1 ♂ is *Halidayina spinipennis* (HALIDAY), 1 ♀ *Telomerina pseudoleucoptera* (DUDA), 1 ♂ *Trachyopella atomus* (RONDANI) and 1 ♂ *Trachyopella leucoptera* (HALIDAY) — and the specimen (s) from which *L. minutissima* had been described is apparently lost. Therefore a lectotype cannot be designated from the syntypic series examined and the species is interpreted in conformity with DUDA (1938) as a synonym of *T. flavipes* (MEIGEN).
Limosina retracta RONDANI: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "1931" (a catalogue No. — red numeral on oval label); paralectotypes 2 ♂ 1 ♀ labelled as the lectotype (MSF).
Limosina (*Limosina*) *ventruosella* VENTURI: Described from specimens (number and sex not specified) from Sicily, Mt. Etna, grotta di S. Gregorio (cave), 31. 8. 1961, M. LA GRECA leg. The type specimens are not deposited in Istituto di Entomologia Agraria (Pisa) but they may be in Istituto Policattedra di Biologia Animale (Catania, Sicily) (letter communication by Dr. F. QUAGLIA, 1979). However, an attempt to borrow them has not been successful.

Material examined (besides "Type material"): 32 ♂ 54 ♀

Spain: 2 ♂ 2 ♀ (JRO) — Tortosa env., Cullar de Baza env. (ROHÁČEK leg.).

The Netherlands: 13 ♂ 12 ♀ (JRO) — Lunteren (EVENHUIS leg.).

Czechoslovakia: 8 ♂ 17 ♀ (JRO, NMP, MHK, SMO, VUP) — Bohemia: Cheb (KOWARZ leg.), Roztoky, Zichovec nr. Slaný (KOVÁŘ leg.), Pardubice-Svítkov (MCCEK leg.), Palupín nr. Stimilov (ROHÁČEK leg.); Moravia: Třešť, Brno-Soběšice, Mor. Kras-Babice, Křtiny (ROHÁČEK leg.), Mor. Kras-Evina jeskyně (MCCEK leg.), Kyjov (PULPÁN leg.); Slovakia: Turček, Lubochňa (ROHÁČEK leg.), Rožňava (PULPÁN leg.).

Hungary: 1 ♂ (JRO) — Aranyosgadány (PAPP leg.).

Roumania: 1 ♂ (IZS) — Mangalia-Doi Mai (CHVÁLA leg.).

Bulgaria: 1 ♀ (IZS) — Studenobutsche-Michailovgrad (BERCN leg.).

Denmark: 18 ♂ 21 ♀ (ZMK) — SJ: Heils (LUNDBECK leg.); EJ: Silkeborg (NIELSEN leg.); WJ: Fanø (MORTENSEN leg.); NWJ: Agger (MORTENSEN leg.); NWZ: Nykøbing (MORTENSEN leg.); NEZ: Damhusmosen (SCHLICK leg.), Holte (LUNDBECK, MORTENSEN leg.), Lungby (LUNDBECK leg.), Hillerød (MORTENSEN leg.), Bognaes (LYNEBORG leg.); B: Balka (MORTENSEN leg.).

Finland: 2 ♂ 1 ♀ (ZMH) — N: Helsinki (FREY leg.), Esbo-Westend (HACKMAN leg.); Om: Nykarleby (FREY leg.).

Description:
Male. Total body length 1.15–1.43 mm, general colour dark brown, greyish brown dusted, dull. Head brown, dusted, dull. Frons brown, posteriorly darker. Frontal triangle somewhat shining, rest of frons dull. Interfrontalia and orbits with some silvery grey pollination. *pvt* well developed; 4–5 *if* of about equal length, rather short; *ads* numerous and arranged in a row running down face, round the fore margin of the eye (Fig. 917). Frontal lunule long, triangular; carina well projecting between antennae, both, as well as face and gena brown and dull. Facial cavity more shining. *g* relatively long. Eye small, its diameter about 1.6 times the smallest genal width. Antennae widely divergent, almost opposite, brown. Arista about 3.2 times as long as the antenna and relatively long ciliate.

Thorax dark brown, brownish grey dusted, dull. Mesonotum somewhat opalescent, pleurae and scutellum completely dull. 1 long external *hu*, instead of the internal *hu* 2 minute microsetae present. 2 *dc*, the anterior short. 6 rows of *ac* microsetae between anterior *dc*, the prescutellar medial *ac* pair enlarged, as are some microsetae external to *dc*. Pleurae with yellowish brown sutures between some sclerites; 2 *stpl*, the anterior short. Scutellum comparatively large, broad, *sc* rather long. Legs brown to pale yellowish brown, femora usually darkest, trochanters and tarsi yellowish. Chaetotaxy of t_2 (Fig. 965), all bristles generally short, *av* below middle very small or almost indistinct. Ratio $t_2 : mt_2 = 1.89–2.08$. Wing (Fig. 952) with distinctly whitish membrane; *C* dark (in Cs_2 almost black) and very far extended beyond R_{4+5}, other veins whitish hyaline. R_{2+3} very slightly bent, R_{4+5} almost perfectly straight. Discal cell very long and narrow, both short processes of M_{1+2} and M_{3+4} beyond t_p distinctly developed. Alula small, narrow, acute. Wing measurements: length 1.25–1.51 mm, width 0.54–0.65 mm, *C*-index = 0.92–1.34, $t_a – t_p : t_p = 3.09–4.83$. Halteres with pale brownish yellow stem and darker brown knob.

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Abdomen with rather weakly sclerotized preabdomen, brown, greyish dusted, slightly shiny. Sterna and to a lesser extent also terga shortly and relatively densely haired. *T1+2* long, with weakly sclerotized and pale pigmented basal medial area. *S5* (Fig. 958) with large, pale, membraneous, semicircular medial area overgrown by fine, short and pale spines and with 2 lateral, flat, finely haired appendages situated posterolaterally to the above membraneous area. These appendages may be more slender (see Fig. 21 of PAPP, 1973a) and asymmetrical. Other surface of *S5* simply densely haired and in front of medial desclerotized area darker pigmented. Enlarged 6th right spiracle (Fig. 955) essentially larger than in *T. pseudoleucoptera* and *T. ursina*.

Genitalia. Periandrium (Figs. 956, 957) of medium length, uniformly densely haired. Cerci greatly reduced, fused with periandrium, each carrying a long ventrocaudal bristle. Cerci are not connected medially, thus, the subanal plate and intraperiandrial sclerite not developed. Hypandrium relatively long, robust, with large lateral arms. Telomere (Fig. 954) long, slender, apically pointed, with numerous long hair-like setae anteriorly and posteriorly. Aedeagal complex (Fig. 953) very simple. Phallophore flat but broad and functionally replacing the subanal plate which is not developed. Distiphallus very simple, with dorsal and ventral simple sclerites and characteristically granulate membraneous apical part. Postgonite long, pointed, with some minute setulae on outer side in apical part and very finely haired anterior margin. Ejaculatory apodeme not found.

Female. Similar to male except for the difference mentioned below. Total body length 1.31–1.67 mm. t_2 chaetotaxy (Figs. 963, 964) with distinct *av* below middle of t_2 and much longer *va*. Ratio $t_2 : mt_2 = 1.87–2.00$. Wing more narrow (Fig. 945), tapering distally. Wing measurements: length 1.39–1.59 mm, width 0.54–0.64 mm, *C*-index = 0.98–1.23, $t_a – t_p : t_p = 3.44–4.00$.

Postabdomen (Figs. 959–961) with long but narrow and pale pigmented *T6* (essentially narrower than *T7*); *T7* short, transversely oblong. *T8* medially very short and with narrow, pale pigmented stripe but laterally very enlarged. *T9* small, somewhat wider than long, darker pigmented laterally and with 2 dorsal setae. *S6* and *S7* simple, the latter shorter and narrower. *S8* large, long, convex, with broadly rounded posterior corners and bearing 2 long ventral bristles. *S9* relatively broad, with large transverse, pale, membraneous area so that it appears to be composed of 2 narrow, transverse, laterally connected stripes. There is a thin, pale and hence barely recognizable stripe connecting the anterior corners of *S9* (as in *T. eburnea* spec. nov.). Spermathecae (Fig. 962) egg-shaped with slender, slightly curved terminal projection. Sclerotized parts of spermathecal ducts short but longer than those of *T. antonini* spec. nov. Cerci short, each with 2 robust terminal bristles, the more internal dorsopreapical being shorter and thicker and the apical longer and thiner; otherwise with some short curved hairs.

Discussion: The species is recognizable primarily by male and female postabdominal structures. Among its Palaearctic congeners, *T. eburnea* spec. nov. and *T. paraflavipes* (PAPP, 1973) appear to be its closest relatives. Both these differ in the armature of the male *S5* and female cerci respectively. A further Palaearctic species, *T. kaszabi* (PAPP, 1973) is apparently less closely related, having wholly differently shaped male *S5* and much shorter telomere (see PAPP, 1973a). Regarding European species, only *T. eburnea* spec. nov. might be confused with *T. flavipes* (MEIGEN) but it differs (besides terminalia) by its more whitish wing with paler *C* and longer *pd* in distal fifth of t_2. The most diagnostic features of *T. flavipes* are: male *S5* with slender posterior appendages; telomere long, slender, pointed and richly haired; postgonite long, slender and apically pointed; female *T6* very narrow, *S9* broad and cerci with 2 short spines (the apical only slightly longer than the dorsopreapical); spermathecae with relatively short, slightly curved terminal process etc.

The synonymy of *T. flavipes* was cleared up by DUDA (1938) and confirmed by the study of the type material (see above). However, *Limosina ventruosella* VENTURI, 1965, is probably also synonymous with *T. flavipes*. VENTURI (1965) described the species on the basis of "physogastric" specimens from Sicilian caves but all differences (including the physogastry) by means of which he distinguished it from *T. flavipes* are within the intraspecific variability of the latter species. Moreover, VENTURI (1965: 13) states that these species do not differ in the male genitalia, not mentioning the fact that *T. flavipes* often occurs in caves and that the abdomen of all gravid females of *Telomerina* species is more or less "physogastric".

Further, I should like to note the undescribed sexual dimorphism of *T. flavipes* (in a lesser extent also in other *Telomerina*) which might bring further confusion. I suspect that *T. gracilipennis* (SPULER, 1925) may well be a female of *T. flavipes* (see Fig. 10 of SPULER, 1925b), although the species was also described from males. However, the final placement of the above taxa will be possible only after study of their genitalia.

Biology: A common, predominantly necrophagous species but also successfully developing in various excrement (especially of carnivores — I have seen a series of specimens reared from dung of mink) and decaying fungi (PAPP, 1973c). It was collected in caves (DUDA, 1928; PAPP, 1978b), in burrows of small mammals and birds (FALCOZ, 1921; GODDARD, 1938; HACKMAN, 1963b) but probably due to its searching for carrion there. It often forms synanthropic populations developing in various refuse on dump heaps and imagoes then occur commonly on windows — SÉGUY (1934) and SCHUMANN (1963) report it from human settlements, ZUSKA & LAŠTOVKA (1969) from abattoirs and poultry farms, PAPP (1975b) from stables etc. The species seems to prefer dark situations. Adults occur during

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the whole vegetation period (II—XI) (combined data of various authors and material examined).

Distribution: Widely distributed, originally probably Palaearctic, now cosmopolitan, species. In Europe recorded from many countries, from Spain, Italy and Greece to Sweden, Finland and Faeroe Is. It is known also from Iceland (ANDERSSON, 1967), Tunisia (DUDA, 1918), USSR: Tadzhikistan (PAPP, 1979a) and Afghanistan (PAPP, 1978a). In consequence of its synanthropy it has been spread by man agency to South Africa (HACKMAN, 1965a), South America (RICHARDS, 1967), Australia (RICHARDS, 1973) and New Zealand (HARRISON, 1959). It can be expected it will be found in other continents in the future.

Telomerina pseudoleucoptera (DUDA, 1924), **comb. nov.**

(Figs. 966—979)

Limosina (*Scotophilella*) *pseudoleucoptera* DUDA, 1924b: 175
Leptocera (*Scotophilella*) *pseudoleucoptera*: DUDA, 1925: 159 (key)
Leptocera (*Limosina*) *pseudoleucoptera*: RICHARDS, 1930: 297
Limosina (*Limosina*) *pseudoleucoptera*: DUDA, 1938: 139
Leptocera pseudoleucoptera: NARTSHUK, 1970: 348 (key)
Limosina pseudoleucoptera: PAPP, 1973c: 51 (key)

Type material: Lectotype ♂ (des. by ROHÁČEK in 1977) labelled: "25 5 16" and "*Scotophilella pseudoleucoptera* m. ♂" (DUDA's handwriting). According to original description, this male has been collected by DUDA at Herten (Westfalen, FRG). Paralectotype ♀ labelled: "Linschoten, 30. VI. 20, DE MEIJERE" and "*pseudoleucoptera* D. ♀ d. DUDA". Both in ZMB.

Material examined (besides "Type material"): 18 ♂ 23 ♀

Czechoslovakia: 12 ♂ 18 ♀ (JRO, MHK, SMO) — Bohemia: Pardubice-Svítkov (MOCEK leg.); Moravia: H. Jeseník Mts.-Skřítek, Rejvíz, Jezerník-Slatě, V. Javorník Mt. (ROHÁČEK leg.); Slovakia: Kremnické poh. Mts.-Turček env., Lubochňa, V. Fatra Mts.-Rakytov Mt., Suchá dolina, N. Tatry Mts.-Vyšná Boca, Belanské Tatry Mts.-Monkova dolina, Tatranská Kotlina-Šarpanec (ROHÁČEK leg.).

Denmark: 6 ♂ 4 ♀ (ZMK) — NEJ: Frederikshavn (MORTENSEN leg.); NEZ: Utterslev Mose (SCHLICK leg.), Skovrøddam (KRYGER leg.), Holte (LUNDBECK leg.).

Sweden: 1 ♀ (ZIL) — without locality (ZETTERSTEDT leg.).

Description:

Male. Total body length 1.01—1.22 mm, general colour blackish brown, greyish brown dusted, relatively dull. Head short and deep, dark brown. Frons brownish black. Ocellar triangle shiny, frontal triangle less shiny. Interfrontalia and orbits somewhat silvery dusted, the rest of frons dark brown dusted and dull. *pvt* well developed; 4 rarely 5 small *if*, the most anterior shorter; *ads* relatively long, arranged in long row as in *T. flavipes*. Frontal lunule blackish brown dusted and dull. Facial cavity and the strongly protruding carina rather shiny. Face and gena wide owing to reduced eye, both brown dusted and dull. *g* thin but well developed. Eye small, its largest diameter about 1.4 times the smallest genal width. Antennae strongly divergent, almost opposite. 3rd antennal segment brown, the preceeding two blackish brown. Arista about 3.0 times as long as antenna, medium long ciliate, distinctly shorter than that of *T. flavipes* and shorter than 3rd antennal segment.

Thorax brownish black, brownish grey dusted, dull; mesonotum somewhat opalescent. 1 long (external) *hu* and 2 microsetae on humeral callus. 2 *dc*, the anterior (postsutural) short; *ac* hairs in 6 rows between anterior *dc*, the medial prescutellar *ac* pair somewhat enlarged. Scutellum comparatively large, roundly trapezoidal, *sc* medium long. Pleurae completely dull, sutures between its sclerites yellowish brown. 2 *stpl*, the anterior very minute. Legs brown, fore coxa, trochanters and tarsi somewhat paler. t_2 chaetotaxy (Fig. 968), ventrally, in distal half, with a row of short bristles, thus *av* not developed. f_2 ventrally without distinctive setosity. Ratio $t_2 : mt_2 = 1.63—1.80$. Wing (Fig. 969) with pale but distinctly brownish membrane, veins pale brown, *C* darker brown and extended far beyond R_{4+5}. Cs_2 more or less thickened though normally not as strongly as in DUDA's (1938, Fig. 32) photograph. R_{2+3} slightly curved to *C*, R_{4+5} not perfectly straight, usually very slightly sinuate. Discal cell long and narrow but generally shorter than in *T. flavipes*; both outer corners with short appendages of M_{1+2} and M_{3+4} beyond t_p, the former continued by indistinct colourless venal fold. Alula small, narrow, pointed. Wing measurements: length 1.06—1.20 mm, width 0.43—0.49 mm, *C*-index = 0.94—1.29, $t_a—t_p : t_p = 2.86—3.50$. Halteres with yellowish brown stem and blackish brown knob.

Abdomen with rather weakly sclerotized preabdomen, blackish brown, dark grey dusted, subshiny. Terga sparsely and shortly haired. *T1+2* long, with somewhat desclerotized mediobasal area. Sterna more densely haired. *S5* (Fig. 979) with membraneous medial area smaller than in *T. flavipes*; it is also only very finely pubescent, not spinulate. The projections arising from this area are long, slender, somewhat tapering distally and situated more anteriorly. The surface of *S5* rather densely bristly haired. 6th right enlarged spiracle (Fig. 972) smaller and more triangular than that of *T. flavipes*.

Genitalia. Periandrium (Figs. 973, 974) medium-sized, more sparsely uniformly haired than that of *T. flavipes*. Cerci very reduced and completely fused with periandrium, each bearing a long hair-like bristle. Subanal plate and intraperiandrial sclerite absent. Hypandrium large. Telomere (Fig. 971) very characteristic, long, slender but unlike all relatives forked in apical half. Both its terminal projections with a number of long hair-like setae. Aedeagal complex (Fig. 970) simple. Phallophore flat but broad and positionally replacing the subanal plate between cerci. Distiphallus resembling that of *T. flavipes* but the membraneous part not as distinctly granulous. Postgonite long, slender, S-shaped and with distinctive, enlarged and finely pubescent apex bearing about 3 very minute setulae. Ejaculatory apodeme absent.

Female. Total body length 1.07—1.26 mm. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Ventral chaetotaxy of t_2 different — *av* below middle of t_2 distinct and *va* much longer (Figs. 966, 967). Ratio $t_2 : mt_2 = 1.67—1.83$. Wing somewhat longer and narrower. Cs_2 usually distinctly thickened. Wing measurements: length 1.09—1.28 mm, width 0.45—0.52 mm, *C*-index = 0.91—1.04, $t_a—t_p : t_p = 2.50—3.33$. Preabdomen and 6th segment with distinctly paler sclerites than the remaining segments of postabdomen.

Postabdomen (Figs. 975—977). *T6* much narrower than *T7*. *T7* short, broad, laterally extended. *T8* medially short but without depigmented membraneous medial stripe, its lateral parts extended and prolonged. *T9* short, simply pigmented, with 2 minute dorsal setulae. *S6* simple, *S7* with transverse, band-like pigmentation, both shortly haired. *S8* comparatively short, more narrow than the very wide *S7*, sparsely haired and posteromedially characteristically pigmented. *S9* narrower than that of *T. flavipes*, with large medial aperture, resembling a frame composed of narrow stripes. Spermathecae (Fig. 978) elongated and with slender and strongly twisted terminal projections. Sclerotized parts of ducts somewhat longer than in *T. flavipes*. Cerci rather longer than in *T. flavipes*, each with 2 short spines (the apical may be slightly longer than the dorsopreapical) which are shorter than those of all related European species.

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Discussion: *T. pseudoleucoptera* (DUDA) is related to *T. flavipes* (MEIGEN) and perhaps to *T. kaszabi* (PAPP, 1973); it resembles them in its narrow wings, long discal cell and similar female cerci with 2 short spines, but differs in having wing membrane pale brownish, not albescent, R_{4+5} not straight, male t_2 with ventral row of spines and without distinct *av*, telomere with forked distal part, apically enlarged postgonite, characteristically pigmented female *S7* and *S8*, peculiar spermathecae etc. The main feature used by DUDA (1924b, 1938) to characterize this species, the incrassate Cs_2, is not suitable for diagnostic purposes because of its great variability. Cs_2 is normally distinctly thickened only in females and so the degree of incrassation figured by DUDA (1924b, 1938) is relatively rare.

The identity of *T. pseudoleucoptera* has been substatiated by study of the type material. It is interesting that I have found 1 ♀ of this species among syntypes of *Limosina minutissima* ZETTERSTEDT (synonym of *T. flavipes*).

Biology: This uncommon species is apparently associated with the dung of large herbivore mammals, especially with cow dung on pasture lands. LAURENCE (1955) bred it from older, dried cow droppings. I have collected it repeatedly on cow, sheep and red deer excrement, only 1 ♂ on horse dung and examined 1 ♂ found on dead slugs. The species lives mainly at higher altitudes. It is a summer species (adults occur in V—IX, LAURENCE, 1955) having probably 2 generations during this period. According to LAURENCE (1955) the life-history lasts 35—68 days.

Distribution: Known only from Europe — GB: England (RICHARDS, 1930, 1976; LAURENCE, 1955), Holland, FRG (DUDA, 1924b, 1938), Czechoslovakia, Denmark, Sweden (material examined, new), Finland (FREY, 1941). VANSCHUYTBROECK (1942) reported it also from Belgium but this record is based on misidentified (DUDA det.) specimen of *Halidayina spinipennis* (HALIDAY).

15. Genus ***Opalimosina*** **gen. nov.**

Group of *L. appendiculata* VILLENEUVE: RICHARDS, 1930: 294
Type species: *Limosina mirabilis* COLLIN, 1902

Diagnosis: The genus is characterized by the following complex of features.

(1) *pvt* always present although sometimes small
(2) 3—4 short *if* of about equal length; the foremost may be shorter
(3) 5—10 *ads* and also some hairs on face
(4) *g* short
(5) eye small and flat
(6) thorax heavily dusted and dull, only mesonotum somewhat subshiny and opalescent
(7) 1 long (external) *hu* and 2—4 additional setulae on humeral callus (one of them — the true internal *hu* — may be enlarged)
(8) 2 *dc*, sometimes with 1—2 enlarged *dc* microsetae in front or between them
(9) 6—8 rows of *ac* hairs in front of suture
(10) scutellum comparatively large, rounded trapezoidal, *sc* medium long or long
(11) 2 *stpl*, the anterior minute
(12) t_2 chaetotaxy (Figs. 1023—1025) similar in both sexes, *av* below middle well developed
(13) *C* reaching to or produced beyond R_{4+5}
(14) R_{4+5} slightly but distinctly bent to *C*
(15) discal cell usually rather long, both appendages of M_{1+2} and M_{3+4} beyond t_p regularly present
(16) alula small, narrow, pointed
(17) female postabdomen short, not narrower than preabdomen at 6th segment
(18) male *S5* comparatively long, larger than foregoing sterna, with various armature
(19) periandrium usually comparatively small, uniformly shortly haired. Cerci fused with periandrium, intraperiandrial sclerite always developed
(20) hypandrium short to medium long
(21) telomere comparatively small, mostly flat and simply shaped

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(22) phallophore with large posterior epiphallus
(23) distiphallus of various shape but usually well sclerotized
(24) postgonite differently shaped in particular subgenera
(25) ejaculatory apodeme small but always present
(26) female postabdomen with strongly modified sclerites
(27) female *T9* small, short, often fused with cerci (except for subg. *Hackmanina*)
(28) female *S8* comparatively small, but often of characteristic structure
(29) female *S9* small, reduced to stripe-like frame or horseshoe-shaped sclerite
(30) spermathecae vesiculate, simple, with short or medium long sclerotized parts of ducts
(31) female cerci usually short and with reduced setosity (never sinuate haired), often fused with *T9*.

Discussion: The genus *Opalimosina* gen. nov. is characterized by some very constant external characters (head, thorax and legs including chaetotaxy and wing venation) and by great diversity of the formation of the male and female terminalia in particular species-groups. The most important features, decisive for the inclusion of species to this genus are thought to be: the small and heavily dusted body, large epiphallus, diversely shaped female postabdomen usually with small *T9* (often fused with cerci), female cerci with reduced setosity to small setulae or spines. These features are apparently apomorphic; some other, largely plesiomorphic characters may also be useful for the characterization of the genus, viz. the wing venation (especially narrow discal cell, R_{4+5} slightly curved, alula small, narrow and pointed) and the presence of *pvt* and ejaculatory apodeme.

The genus *Opalimosina* (especially some of its subgenera — *Pappiella*, *Hackmanina*) shows some affinity to the genus *Telomerina* gen. nov. but at present these relationships are rather obscure (see the chapter "Phylogeny"). Owing to very diverse structure of the genitalia found in particular species-groups belonging to the genus *Opalimosina*, it was necessary to divide it into 4 subgenera. This at first sight rather atomistic decision was substantiated during the investigation of their interrelationships within the genus *Opalimosina*. The cladistic classification of these subgenera is very difficult (because of the small number of shared synapomorphies and large number of autapomorphies) and I have been obliged provisionally to select 2 most probable possibilities (see cladograms in Figs. 66, 67). A more detailed discussion is in the chapter "Phylogeny".

Opalimosina gen. nov. includes 7 species in Europe; no further species are known from the whole Palaearctic. The subgenus *Pappiella* subgen. nov. includes only *O.* (*P.*) *liliputana* (RONDANI, 1880); similarly *Hackmanina* subgen. nov. only *O.* (*H.*) *czernyi* (DUDA, 1918) and *Dentilimosina* subgen. nov. only *O.* (*D.*) *denticulata* (DUDA, 1924). The subgenus *Opalimosina* s. str. contains 4 species, viz. *O.* (*O.*) *mirabilis* (COLLIN, 1902), *O.* (*O.*) *calcarifera* (ROHÁČEK, 1975), *O.* (*O.*) *simplex* (RICHARDS, 1929) and *O.* (*O.*) *collini* (RICHARDS, 1929). There are 2 species, described from Nearctic Region, which possibly belong to *Opalimosina* gen. nov., viz. *Limosina evanescens* TUCKER, 1907, and *Leptocera* (*Scotophilella*) *levifrons* SPULER, 1925, but their descriptions do not allow their placement here without some doubts.

Key to European subgenera and species

1 Scutellum with an additional small bristle in front of basal *sc*. Male cerci modified in a long, ventrally projecting and pointed processes (Fig. 1012). Epiphallus very long (Fig. 1009), slender and pointed but simple. Female *S7* very large and covering all following sterna in ventral view (Fig. 1016) (*Dentilimosina* subgen. nov.) . . . . . *O.* (*D.*) *denticulata* (DUDA)

— Scutellum with only 4 usual *sc*. Male cerci not or slightly projecting ventrally. Epiphallus different. Female *S7* smaller (shorter) and transverse 2

2(1) Aedeagal complex (Fig. 990) with robust and apically forked epiphallus; distiphallus also with large double posteroventral projection, postgonite long and curved several times. Female postabdomen with *T7* bearing lateral wing-like appendages, divided *T8* and very long *S6* (Figs. 993, 994) (*Pappiella* subgen. nov.) . . . . . *O.* (*P.*) *liliputana* (RONDANI)

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— Aedeagal complex with simple epiphallus; postgonite at most simply and slightly bent and distiphallus without posteroventral projection. Female *T7* without lateral appendages, *T8* undivided and *S6* short 3

3(2) Between *occi* and *occe* an additional inclinate seta. Eye larger, its diameter more than 2.5 times as long as the narrowest genal width; male f_2 basally with a group of bristles (Fig. 983); male *S5* long (Fig. 1001); distiphallus very wide, postgonite bare and pointed (Fig. 997). Telomere somewhat bilobed (Fig. 998). Female postabdomen with *T6* narrower than *T7* (Fig. 1002) and with strikingly enlarged *T9* being modified to an oblong and shiny plate covering bases of cerci. Female *S8* short but wide, *S9* bipartite (Fig. 1004), female cercus with 2 robust short spines on apex (*Hackmanina* subgen. nov.) . . *O.* (*H.*) *czernyi* (Duda)

— No additional seta between *occi* and *occe*. Eye smaller, its diameter less than 2.2 times as long as the narrowest genal width. Male f_2 simply haired. Male *S5* differently formed, shorter. Distiphallus narrower, postgonite not completely bare and not acutely pointed. Telomere plain, flat. Female *T6* not essentially narrower than *T7*, *T9* small and fused with cerci (sometimes divided into 2 plates), female *S8* short, narrow and of characteristic shape, *S9* simple, stripe-like and horseshoe-shaped. Female cercus differently armed (*Opalimosina* s. str.) 4

4(3) *C* distinctly overpassing R_{4+5} (Fig. 1029). t_3 with very long, curved, spine-like ventropreapical spur (Fig. 1063). Male *S4* and *S5* as in Figs. 1034, 1035; telomere small (Fig. 1031), armed by 3 robust bristles on posterior corner; postgonite (Fig. 1030) tapering distally. Female *T9* divided into 2 plates, *S8* with a peculiar protuberance (Fig. 1019). Female cerci comparatively long, each with a thick, apically bent, dorsopreapical spine (Fig. 1018) . . *O.* (*O.*) *mirabilis* (Collin)

— *C* not or indistinctly extended beyond R_{4+5} (Fig. 1036). t_3 with much smaller ventropreapical spur (Figs. 1060—1062). Male *S4* simple and male *S5* differently haired; telomere differently armed, postgonite distally widened. Female *T9* not divided but completely fused with cerci; female *S8* without protuberance, cerci short and with very short setulae 5

5(4) t_3 with distinctly developed ventropreapical spur (Fig. 1062). Male *S5* (Fig. 1041) very shortly and sparsely haired; telomere as in Fig. 1038. Male cerci somewhat producing ventrally (Fig. 1040). Aedeagal complex (Fig. 1037). Female *T9* (Fig. 1042) reduced to a small, narrow stripe connecting bases of cerci. Female *S8* as in Fig. 1044 . . . . . *O.* (*O.*) *calcarifera* (Roháček)

— t_3 with small ventropreapical spur, sometimes poorly visible (Figs. 1060, 1061). Male *S5* more densely and longer haired. Male cerci not projecting ventrally. Aedeagal complex, telomere and female postabdomen differently formed . . . 6

6(5) Male *S5* (Fig. 1055) with a pale rhomb-like area in the middle. Telomere comparatively richly haired and with biapical anterior corner (Fig. 1052). Aedeagal complex as in Fig. 1051. Female *T9* completely fused with short cerci; each cercus with very minute setulae on apex. Female *S8* (Fig. 1058) with deep posteromedial incision and with an additional stripe-like convex sclerite being mostly invaginated into 8th segment . . . . . *O.* (*O.*) *simplex* (Richards)

— Male *S5* (Fig. 1069) with a pale arc-shaped stripe on disc. Telomere sparsely haired, with simple anterior corner and 2 long bristles on posterior corner (Fig. 1066). Aedeagal complex as in Fig. 1065. Female *T9* fused with cerci but more distinctly differentiated. Each cercus (Fig. 1046) with somewhat larger setae on apex. Female *S8* (Fig. 1048) of oval form and medially paler pigmented . . . . . *O.* (*O.*) *collini* (Richards)

Subgenus ***Pappiella*** **subgen. nov.**

Type species: *Limosina liliputana* Rondani, 1880

Diagnosis: The subgenus can be defined as follows.

(1) *pvt* small but distinct

(2) between *occi* and *occe* an additional small inclinate seta

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(3) 4 *if* of about equal length
(4) numerous (more than 10) *ads* arranged in a long row on orbit and face
(5) *g* short but rather robust
(6) eye small and flat
(7) thorax heavily dusted and dull
(8) 1 long (external) *hu* and 3—4 microsetae on humeral callus
(9) 2 *dc*, sometimes with 1—2 enlarged microsetae in front or between them
(10) 8 rows of *ac* hairs
(11) scutellum comparatively large, roundly trapezoidal; *sc* rather long
(12) 2 *stpl*, the anterior very minute
(13) t_2 chaetotaxy (Figs. 980—982) similar in both sexes
(14) *C* extended beyond R_{4+5}
(15) R_{4+5} slightly but distinctly bent to *C*
(16) discal cell rather long, oblong, with both short appendages of M_{1+2} and M_{3+4}
(17) alula small, narrow and pointed
(18) female postabdomen short, not narrower than preabdomen at 6th segment
(19) male *S5* posteriorly with large, unpigmented and finely spinulate area
(20) periandrium uniformly shortly haired; subanal plate and intraperiandrial sclerite developed
(21) hypandrium somewhat reduced, especially the medial rod-like anterior part
(22) telomere small, with long setosity
(23) phallophore posteriorly forming a very robust, apically bifurcate epiphallus
(24) distiphallus with unique, posteroventral, apically hammer-like, double projection
(25) postgonite very slender, long, curved several times and with some minute setulae subapically
(26) ejaculatory apodeme small
(27) female *T7* with conspicuous lateral flat, wing-shaped appendages
(28) female *T8* divided into 2 widely separated lateral plates
(29) female *T9* very short, transverse, with more small setulae
(30) female *S6* unusually long, *S7* very short, transverse
(31) female *S8* reduced to a small and bare plate
(32) female *S9* double, frame-like and composed of narrow stripes
(33) spermathecae vesiculate, rather irregularly shaped.
(34) female cerci short, each with 2 robust spines on apex.

Discussion: The subgenus is one of the most aberrant groups of the genus *Opalimosina* and is characterized by a number of clearly autapomorphic features (formation of epiphallus, distiphallus, postgonite, female *T7*, *T8*, *S6*, *S7*, *S8*). The subgenus shows some affinity to subgen. *Hackmanina* (shared features: additional seta between *occi* and *occe*, double female *S9*, female cerci not fused with *T9* and each with 2 thick spines) but its aedeagal complex is of quite unique form, male *S5* similar to that of *Dentilimosina* subgen. nov., female postabdomen has differently formed sclerites and *C* is distinctly extended beyond R_{4+5}. Therefore, the position of *Pappiella* subgen. nov. in cladogram is at present rather uncertain — two probable solutions can be seen in Figs. 66, 67. The subgenus *Pappiella* includes only the type species *O.* (*P.*) *liliputana* (RONDANI, 1880).

Remarks: The subgenus is named after Dr. LÁSZLÓ PAPP (TMB).

Opalimosina (Pappiella) liliputana (RONDANI, 1880), spec. rev., **comb. nov.**

(Figs. 980—982, 987—995)

Limosina liliputana RONDANI, 1880: 26; ROHÁČEK, 1981: 166
Limosina (*Scotophilella*) *liliputana*: DUDA, 1918: 137
Leptocera liliputana: SÉGUY, 1934: 466
Limosina (*Leptocera*) *appendiculata* VILLENEUVE, 1918b: 79
Limosina (*Scotophilella*) *appendiculata*: DUDA, 1924b: 173
Leptocera (*Scotophilella*) *appendiculata*: DUDA, 1925: 158 (key)
Leptocera (*Limosina*) *appendiculata*: RICHARDS, 1930: 294
Limosina (*Limosina*) *appendiculata*: DUDA, 1938: 108
Leptocera appendiculata: NARTSHUK, 1970: 347 (key)
Limosina appendiculata: PAPP .1973c: 54 (key)

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Type material:
Limosina liliputana RONDANI: Lectotype ♀ (des. by ROHÁČEK in 1979) labelled: "1932" (= a catalogue No. – red numeral on oval label). The specimen is in good condition (MSF).
Limosina (Leptocera) appendiculata VILLENEUVE: Described from 2 ♂ "Franzensbad (= Františkovy Lázně, Czechoslovakia), 26. 7. 1913, KOWARZ leg." and 1 ♀ "Rambouillet (France), 30. 4. 1911, VILLENEUVE leg." (VILLENEUVE, 1918b). Location of types unknown, probably lost (not examined).

Material examined (besides "Type material"): 83 ♂ 102 ♀

Belgium: 2 ♂ (IRB) – Moorsel (BALL leg.), Knoeke (BEQUAERT leg.).

FRG: 4 ♂ 1 ♀ (ZMB) – Rheinland: St. Wendel (DUDA leg.); Westfalen: Herten (DUDA leg.).

GDR: 2 ♂ 1 ♀ (ZMB) – Harz Mts.-Ilfeld (DUDA leg.), Frankfurt an Od. (SCHUKATSCHEK leg.).

Czechoslovakia: 66 ♂ 88 ♀ (JRO, NMP, PFB, VUP, SMO) – Bohemia: Doupovské hory Mts.-Lochotín (ROHÁČEK leg.), Praha-Strašnice (KOVÁŘ leg.), Třeboň, Palupín nr. Strmilov (ROHÁČEK leg.), Černá nr. Bohdaneč (MOCEK leg.); Moravia: Třešť, Brno-Soběšice, Drahanská vys.-Jaroměřice, Opava, Hněvošice, Brumovice (distr. Opava), H. Jeseník Mts. -Skřítek, Rejvíz, Kouty n. D., Hukvaldy (ROHÁČEK leg.), Val. Meziříčí (VALEŠOVÁ leg.); Slovakia: Turček env., Lubochňa, V. Fatra Mts.-Suchá dolina, N. Tatry Mts.-Demänovská dolina, Slov. Kras-Hrušov, Silická ladnica, Belanské Tatry Mts.-Plesnivec, Tatranská Kotlina (ROHÁČEK leg.).

Austria: 3 ♂ 3 ♀ (IZI) – Tyrol: Obergurgl Mt. (STOCKNER leg.).

Bulgaria: 1 ♀ (IZS) – Sofia-Geleznitza (BESHOVSKI leg.).

Denmark: 1 ♂ 6 ♀ (ZMK) – F: Tåsinge (LUNDBECK leg.); NEZ: Hillerød, Holte (LUNDBECK leg.); B: Balka (MORTENSEN leg.).

Finland: 5 ♂ 2 ♀ (ZMH) – Al: Geta (FREY leg.); Ab: Vihti (HACKMAN leg.), Nystad (HELLÉN leg.); N: Helsinki (FREY leg.), Borgå-Seitlax (NORDMAN leg.); Ta: Messuby (FREY leg.).

Description:
Male. Total body length 1.23–1.58 mm, general colour brownish black, densely dark greyish brown dusted, dull. Head brownish black. Frons with narrow, long and subshining frontal triangle; orbits, narrow interfrontalia and ocellar triangle silvery grey pollinose and somewhat glittering; the rest of frons blackish brown dusted, dull. Anterior margin of frons usually paler brown. *pvt* minute but distinct; between well developed *occe* and *occi* an additional inclinate seta. 4 *if* of about equal length. More than 10 small *ads* in a long row running on orbits and face round the anterior margin of eye (as in *Telomerina*). Face and gena dark brown, dusted. Frontal lunule blackish brown, subshiny. Facial cavity brownish black and shiny; carina well protruding between antennae. *g* short but rather thick. Eye comparatively small, its diameter about 1.9 times as long as the narrowest genal width. Antennae with 2 basal segments blackish; 3rd segment dark brown with its ciliation as long as that of arista. Arista about 2.9–3.1 times as long as antenna and relatively long pubescent.

Thorax brownish black, greyish brown dusted. Pleurae more dusted, mesonotum somewhat opalescent. Humeral callus besides the long external *hu* with 3–4 microsetae one of which is the reduced internal *hu*. 2 *dc*, the anterior short; in front of the latter often 1–2 enlarged *dc* microsetae; similarly also one of *dc* microsetae between *dc* macrosetae may be enlarged. 8 rows of *ac* hairs; the medial 2 rows and especially the medial prescutellar pair of *ac* somewhat enlarged. Scutellum elongate, roundly trapezoidal, *sc* comparatively long. Pleurae with yellowish sutures between sclerites. 2 *stpl*, the anterior very minute. Legs brown, trochanters and tarsi a little paler. t_2 chaetotaxy as in Fig. 982, *av* below middle distinct. Ratio $t_2 : mt_2 = 1.86–2.04$. Wing (Fig. 987) with very pale brownish membrane, veins pale brown. *C* brown and far extended beyond R_{4+5}. R_{2+3} apically curved to *C*, R_{4+5} slightly but distinctly bent, apically somewhat straighter. Discal cell large and long, with short appendages of M_{1+2} and M_{3+4} (the former continued by colourless fold); outer corners of discal cell roughly rectangular. Alula small, narrow, pointed. Wing measurements: length 1.20–1.58 mm, width 0.55–0.70 mm, *C*-index = 1.12–1.45, $t_a – t_p : t_p = 2.10–2.63$. Halteres with yellowish brown stem and dark brown knob.

Abdomen brownish black, greyish dusted, dull to somewhat opalescent. Terga sparsely and shortly haired, sterna more densely and longer haired. *T1+2* simply pigmented and sclerotized. *S5* (Fig. 991) broad, posteriorly with large, semicircular, desclerotized and pale pigmented area, densely overgrown by very fine and pale spines.

Genitalia. Periandrium (Fig. 989) sparsely, simply haired. Cerci fused with periandrium but distinct, each with 3–4 longer setae. Subanal plate and intraperiandrial sclerite present. Hypandrium with robust basal arms and reduced, slender mediodistal rod-like part. Telomere (Fig. 988) small, pale, weakly sclerotized, ventrally somewhat incised, with a group of long bristles at posterior and ventral margins, and posterodorsally with some micropubescence. Aedeagal complex (Fig. 990) very peculiar. Phallophore mainly formed by the very large epiphallus. Epiphallus posteriorly flattened and forked. Distiphallus posteroventrally projects in robust, apically hammer-like enlarged paired projection; anterior part of distiphallus rather weakly sclerotized, apically membraneous apart from 2 slender apicoventral sclerites. Postgonite also conspicuous, slender, heavily sclerotized, curved several times and apically shoe-shaped, subapically with 2–3 small setulae. Ejaculatory apodeme small.

Female. Similar to male but differs as follows. Total body length 1.34–1.81 mm. t_2 chaetotaxy corresponding with that of the male but *av* and *va* longer and thicker (Figs. 980, 981). Ratio $t_2 : mt_2 = 1.86–1.97$. Wing measurements: length 1.26–1.67 mm, width 0.55–0.73 mm, *C*-index = 1.15–1.48, $t_a – t_p : t_p = 1.93–2.62$.

Postabdomen (Figs. 992–994). *T6* simple. *T7* medially glabrous and lustrous, laterally pruinose, and of complex form – especially its lateral wing-shaped flat appendages highly characteristic. *T8* reduced and divided into 2 rather small plates situated quite laterally. *T9* small, short, transverse, medially with pale pigmented stripe, dorsally with a number of minute setulae. *S6* extremely long, longer than all following sterna together. In comparison *S7* very short, transversely stripe-shaped, composed of more sclerotized and darker bare medial part and of more weakly sclerotized and setose lateral parts. *S8* small, semicircular, anteriorly incised, bare. *S9* frame-like, composed of narrow stripes. Spermathecae (Fig. 995) vesiculate, sclerotized parts of ducts of medium length. Cerci short, each with 2 short but thick spines and some small hairs.

Preimaginal stages: OKELY (1974: 50, Figs. 25–27) described and illustrated the puparium. It resembles that of *O. mirabilis* most closely (by long papillae on spine-like anterior spiracular processes, by long and narrow posterior spiracular projections) but it is not bent at 7th segment.

Discussion: *O. liliputana* (RONDANI) is a very aberrant species of the genus *Opalimosina* (cf. the formation of the aedeagal complex and female postabdomen) and is therefore placed in a separate subgenus *Pappiella* subgen. nov. By its external characters (wing, t_2 and mesonotal chaetotaxy) it somewhat resembles *O. denticulata* (DUDA) but it does not possess the additional setae on scutellum and its terminalia in both sexes are wholly different.

O. liliputana has been described by RONDANI (1880) from some specimens from Italy. DUDA (1918) correctly recognized this species from RONDANI's (1880) description but later

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(DUDA, 1924b) accepted VILLENEUVE's opinion that the species he considered to be *O. liliputana* is different from the true *L. liliputana* and is *Limosina appendiculata* VILLENEUVE, 1918. This interpretation was followed by all subsequent authors and *Limosina liliputana* was considered a species dubia. However, the examination of the type material of *Limosina liliputana* by ROHÁČEK (1981) proved that it is really conspecific with *Limosina appendiculata* VILLENEUVE which therefore becomes a synonym. The type material of *Limosina appendiculata* has not been traced but the VILLENEUVE's (1918b) description is sufficient for recognition of this species.

Biology: The species is obviously polysaprophagous (breeding records from decayed grass — OKELY, 1974) commonly occurring on decaying vegetation (e.g. in compost heaps — DUDA, 1924b), on rotten fungi (RICHARDS, 1930) and on excrement of various mammals, especially in mountains (I have collected it on cow, red deer, horse, bear and human excrement). It was also found rarely in burrows of rabbits (RICHARDS, 1930; OKELY, 1974), nests of humble-bees (RICHARDS, 1930), in caves (DUDA, 1928) and on carrion (DUDA, 1938). The species may also form hemisynanthropic populations in the environment of man's settlements (e.g. on compost and dump heaps) and then it often occurs on house windows (RICHARDS, 1930; SÉGUY, 1934; SCHUMANN, 1963). ZUSKA & LAŠTOVKA (1969) found some specimens in poultry farms. *O. liliputana* is clearly more frequent in higher altitudes and was collected up to 2,120 m in the Alps (PAPP, 1976b). Adults occur during the whole year (RICHARDS, 1930 and material examined).

Distribution: Hitherto recorded only from Europe — GB: England (RICHARDS, 1930; OKELY, 1974), France (VILLENEUVE, 1918b; SÉGUY, 1934), Belgium (VANSCHUYTBROECK, 1942), FRG (DUDA, 1918), GDR (DUDA, 1918; SCHUMANN, 1963), Czechoslovakia (VILLENEUVE, 1918b; ZUSKA & LAŠTOVKA, 1969; ROHÁČEK, 1978b, 1980), Austria (PAPP, 1975a, 1976b; TROGER & ROHÁČEK, 1980), Italy (RONDANI, 1880), Hungary (PAPP, 1973c), Bulgaria, Denmark (material examined, new), Finland (FREY, 1941).

Subgenus ***Hackmanina*** **subgen. nov.**

Type species: *Limosina* (*Scotophilella*) *czernyi* DUDA, 1918

Diagnosis: The subgenus can be characterized as follows.

(1) *pvt* distinctly developed
(2) between *occi* and *occe* an additional inclinate seta
(3) 4 *if* of about equal length (the foremost usually shorter)
(4) 6—8 small *ads* inside and below *ors*
(5) *g* rather small
(6) eye flat but larger compared to that of other subgenera of *Opalimosina*
(7) thorax dusted, dull, but mesonotum somewhat shining
(8) 1 long (external) *hu*, the internal *hu* small and hidden among 3 microsetae arising on humeral callus
(9) 2 *dc*, the anterior shorter
(10) 8 rows of *ac* microsetae between anterior *dc*
(11) scutellum roundly trapezoidal, *sc* long
(12) 2 *stpl*, the anterior minute
(13) t_2 chaetotaxy (Figs. 1006, 1007); *av* and *va* short in male, longer in female; male f_2 with a cluster of small bristles basally (Fig. 983).
(14) *C* not extending beyond R_{4+5}
(15) R_{4+5} slightly bent up to *C*
(16) discal cell comparatively short; appendages of M_{1+2} and M_{3+4} also small
(17) alula small, narrow, pointed
(18) female postabdomen short, not narrower than preabdomen at 6th segment
(19) male *S5* large and very long, with posteromedial area covered by cuticular projections and with comb of spines on posterior margin
(20) periandrium uniformly haired; subanal plate reduced but the intraperiandrial sclerite well developed

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(21) male cerci fused with periandrium, each with a longer hair
(22) hypandrium of medium length
(23) telomere short, somewhat bilobed, with some thick spines
(24) phallophore with large but simple epiphallus
(25) distiphallus very wide, ventroapically pubescent
(26) postgonite simple, pointed and bare
(27) ejaculatory apodeme small
(28) female *T6* much narrower than *T7*; *T7* simply transversely stripe-shaped
(29) female *T8* not divided, only medially paler pigmented
(30) female *T9* enlarged, modified in an oblong shiny plate with a thick short spine on each posterior corner
(31) female *S6* and *S7* short, transverse
(32) female *S8* short but comparatively wide, with 2 long hairs
(33) female *S9* composed of 2 parts, the larger anterior and the smaller, stripe-shaped posterior
(34) spermathecae ball-shaped, regularly finely tuberculate
(35) female cerci inserted under *T9*, each armed by 2 short and thick spines on apex.

Discussion: *Hackmanina* subgen. nov. is a further aberrant subgenus of *Opalimosina* characterized by a number of clearly autapomorphic features, especially in the female postabdomen (male f_2 with basal group of short bristles, completely bare postgonite, very long male *S5*, reduced subanal plate, female *T9* enlarged and covering bases of cerci, female *S7* wide, *S9* bipartite and rather frame-shaped, tuberculate spermathecae). As it was pointed out above, subgen. *Hackmanina* shows some affinities to subgen. *Pappiella* (female cerci, female *S9*, additional seta between *occi* and *occe*) but on the contrary also to the remaining subgenera of *Opalimosina* (aedeagal complex with shorter postgonite and simple epiphallus and distiphallus). Thus, the cladogeny of the subgenus *Hackmanina* is meantime somewhat doubtful (see Figs. 66, 67). The fungivority of the only species of *Hackmanina*, viz. *O.* (*H.*) *czernyi* (DUDA, 1918) is also rather peculiar (all other *Opalimosina* are predominantly coprophagous) and can be considered a further autapomorphic feature of the subgenus.

Remarks: The subgenus is dedicated to Professor WALTER HACKMAN (ZMH) for his invaluable help during my study in the Sphaeroceridae.

Opalimosina (Hackmanina) czernyi (DUDA, 1918), **comb nov.**

(Figs. 983, 996–1007)

Limosina (*Scotophilella*) *Czernyi* DUDA, 1918: 123
Leptocera (*Scotophilella*) *Czernyi*: DUDA, 1925: 156 (key)
Limosina (*Limosina*) *Czernyi*: DUDA, 1938: 117
Limosina Czernyi: PAPP, 1973c: 43 (key)
Limosina czernyi: ROHÁČEK, 1975c: 116
Limosina (*Scotophilella*) *Lambi* DUDA, 1928: 172
Leptocera (*Limosina*) *lambi*: RICHARDS, 1930: 294
Limosina (*Limosina*) *Lambi*: DUDA, 1938: 127
Leptocera lambi: NARTSHUK, 1970: 348 (key)

Type material:
Limosina (*Scotophilella*) *Czernyi* DUDA: Described from single male from Admont (Austria, CZERNY leg.). Unfortunately this specimen (considered holotype) has not been traced (not examined).
Limosina (*Scotophilella*) *Lambi* DUDA: Lectotype ♀ (des. by ROHÁČEK in 1977) labelled: "New Forest, 10. 1903, C. G. LAMB", "Type ♀" and "*S. Lambi* n. sp. ♀ det. DUDA" (handwriten by DUDA); the specimen is in perfect condition. Paralectotype ♂, with same locality label as the lectotype; other labels: "Type ♂", "*Scotophilella Lambi* n. sp. ♂ d. DUDA" and "broken in return". The specimen consists of only one (right) wing and abdomen with a part of thorax (now put in a microvial in glycerine and pinned below specimen) (both MZC).

Material examined (besides "Type material"): 14 ♂ 14 ♀

FRG: 1 ♂ 1 ♀ (ZMB) — Nordbayern (RIEDEL leg.).

Czechoslovakia: 13 ♂ 11 ♀ (JRO) — Bohemia: Palupín nr. Strmilov (ROHÁČEK leg.); Moravia: Třešt, Brno-Soběšice, Lednice (ROHÁČEK leg.).

Hungary: 2 ♀ (TMB) — Börzsöny hg.-Magyarkút (BAJZA, PAPP leg.); Zalalövö erdö (MIHÁLYI leg.).

Description:
Male. Total body length 1.06–1.42 mm, general colour dark brown, brownish dusted, subshiny. Head blackish brown. Frons brownish black, with brown anterior margin. Frontal triangle comparatively large, broad and shiny. Interfrontalia and also partly orbits silvery grey dusted and glittering. Rest of frons between frontal triangle, interfrontalia and orbits brownish dusted and dull. *pvt* well developed; *occi* long; an additional seta between *occi* and *occe* as in *O. liliputana*. 4 *if*, the anterior usually smaller; 6–8 minute *ads* inside and below *ors*, some small hairs on face in front of anterior margin of eye also present. Frontal lunule, face, gena and facial cavity dark brown, only the latter shiny. *g* small but longer than peristomal hairs. Eye large compared to other *Opalimosina*, its diameter about 2.7 times as long as the narrowest genal width. Antennae

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dark brown, with paler 3rd segment; arista about 3.2 times as long as antenna, medium long (shorter than that of *O. liliputana* or *O. denticulata*) ciliate.

Thorax brown, greyish brown dusted; mesonotum relatively shiny, pleurae dull. 1 strong external *hu*; the internal reduced to a microseta and hardly longer than 2 additional setulae on humeral callus. 2 *dc*, also the anterior comparatively long. In front of posterior *dc* often an enlarged *dc* microseta. 8 rows of *ac* hairs between anterior *dc*; the medial prescutellar *ac* pair distinctly enlarged. Scutellum roundly trapezoidal, with densely finely granulate surface; *sc* long. Pleurae with yelowish suture between sclerites. 2 *stpl*, the anterior reduced to a minute hair. Legs brown, trochanters and tarsi yellowish brown. t_2 chaetotaxy (Fig. 983), *av* below middle present, *va* short. Distally to *av* a row of small setulae. f_2 basally with a cluster of small bristles. Ratio $t_2 : mt_2 = 1.78-1.91$. Wing (Fig. 996) rather broad, with pale brownish membrane, veins pale brown, *C* darker. *C* hardly overpassing R_{4+5}. R_{2+3} apically very slightly bent to *C*. R_{4+5} very slightly curved up to *C*. Discal cell rather short; the appendages of M_{1+2} and M_{2+4} beyond t_p small, the latter usually longer. Alula small, narrow, pointed. Wing measurements: length 1.11–1.36 mm, width 0.51–0.61 mm, *C*-index = 0.85–1.00, $t_a - t_p : t_p = 1.80$ to 2.44. Halteres with yellow stem and brown knob.

Abdomen brown, greyish brown dusted, subshiny. Terga sparsely haired. *T1+2* simply pigmented and sclerotized. Sterna more densely haired. *S5* and *S7* large, long. *S5* (Fig. 1001) shortly haired, posteromedially with a large oval area, densely covered by small blunt cuticular projections. Posterior margin of this part provided with a comb of blunt spines; a pair of short blunt spines also in its middle. Lateral parts of *S5* terminated by flat posterior appendages overgrown by similar cuticular excrescences as the posteromedial area.

Genitalia. Periandrium (Figs. 999, 1000) short, uniformly haired but the setae round anal fissure distinctly longer. Cerci fused with periandrium, but medially below anal opening connected only through mediation of the intraperiandrial sclerite (subanal plate reduced). Each cercus with a longer hair-like seta on small posteroventral conical projection. Hypandrium of medium length. Telomere (Fig. 998) with small and pointed anterior corner, posterior corner larger, lobe-shaped, with 2 robust posterior spines and ven rally with a row of short conical spines. Aedeagal complex (Fig. 997). Phallophore with large but simple epiphallus. Distiphallus with very wide apical part and ventroapically with 2 finely pubescent sclerites. Postgonite darkly pigmented, pointed, bare. Ejaculatory apodeme small.

Female. Head, thorax, legs, wing and preabdomen as in the male besides differences mentioned below. Total body length 1.23–1.53 mm. t_2 (Figs. 1006, 1007) without a row of minute ventral setulae but with longer *av* and especially *va*. f_2 basally simply haired. Ratio $t_2 : mt_2 = 1.85-2.00$. Wing measurements: length 1.17–1.42 mm, width 0.55–0.65 mm, *C*-index = 0.85–1.04, $t_a - t_p : t_p = 1.19-2.50$.

Postabdomen very peculiar (Figs. 1002–1004). *T6* longer but much narrower than the transversely stripe-shaped *T7*. *T8* dorsomedially short and with pale pigmented, membraneous medial stripe, laterally somewhat extended. *T9* unusually large, forming a flat, oblong, shiny and medially depigmented plate carrying 2 thick short spines in its posterior corners. *T9* wholly covers bases of cerci. *S6* very wide, transverse. *S7* somewhat narrower but also short and transverse, posteromedially with a pair of longer hairs and small, pale pigmented area. *S8* flat, transverse, comparatively wide, finely pubescent and with 2 long lateral hairs. *S8* is situated on the posterior part of 7th segment. *S9* very characteristic, composed of 2 parts, the larger and complicated anterior and the small, stripe-shaped posterior which carries a longer seta on each side. Spermathecae (Fig. 1005) ball-shaped, with regularly tuberculate surface of bodies and short sclerotized parts of ducts. Cerci of medium length, with bases hidden under the enlarged *T9*; each cercus armed by 2 short, thick spines and some small hairs.

Discussion: The species differs essentially from all other *Opalimosina* species by the peculiar male genitalia and especially the female postabdomen, and hence is placed in a separate subgenus *Hackmanina* subgen. nov. Besides its characteristic terminalia, the species can also be recognized by the comparatively large eyes, rather shiny mesonotum, male f_2 and t_2 chaetotaxy, relatively broad wings with *C* not extended beyond R_{4+5} etc.

Although DUDA (1938) presented both *Limosina czernyi* DUDA and *Limosina lambi* DUDA as different species, he mentioned (p. 127) that they might be synonymous. Recently, PAPP (1973c) included in his key only *Limosina czernyi* and reduced *L. lambi* to its synonym. This conclusion was confirmed by the present examination of the type and comparative material.

Biology: Despite the scarce data on the biology of this species, it can be stated that it is probably predominantly fungivorous. The majority of specimens (13 ♂ 9 ♀) I have examined were collected on decaying fungi (*Russula* spec., *Lactarius* spec., *Pleurotus ostreatus*) and also DUDA (1938) refers to a female captured on a fungus *Hypholoma fasciculare*. The other sporadic records are from nest of *Buteo buteo* (DUDA, 1938), from faeces and soil traps (PAPP, 1973c and 1976a — as *Limosina glabrescens*) and from dump heap (material examined). The species seems to prefer lower altitudes (highest found occurrence site — 600 m). Adults occur in V–XI (combined data of above authors and material examined).

Distribution: Very insufficiently known. Europe only — GB: England (DUDA, 1928, 1938; RICHARDS, 1930), FRG, GDR (DUDA, 1938), Czechoslovakia (ROHÁČEK, 1978b), Austria (DUDA, 1918), Hungary (PAPP, 1973c, 1976a — as *Limosina glabrescens*).

Subgenus ***Dentilimosina*** **subgen. nov.**

Type species: *Limosina* (*Scotophilella*) *denticulata* DUDA, 1924

Diagnosis: The subgenus can be defined as follows.

(1) *pvt* present but small

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(2) no additional seta between *occi* and *occe*
(3) 4 *if* of about equal length
(4) 4—6 minute *ads* inside and below *ors*; some minute hairs also on face
(5) *g* short but thick
(6) eye small and flat
(7) thorax heavily pollinose, dull
(8) 2 *hu*, the internal reduced but clearly longer than 2 additional microsetae on humeral callus
(9) 2 *dc*, the anterior very short
(10) 6—8 rows of *ac* microsetae
(11) scutellum comparatively large, roundly elongate trapezoidal, with 2 *sc* of medium length and 1 small additional seta in front of basal *sc*
(12) 2 *stpl*, the anterior reduced to a microseta
(13) t_2 chaetotaxy (Figs. 984—986) similar in both sexes
(14) *C* extended beyond R_{4+5}
(15) R_{4+5} slightly bent to *C*
(16) discal cell comparatively long, oblong, with short appendages of M_{1+2} and M_{3+4} beyond t_p
(17) alula small, narrow and acute
(18) female postabdomen short, not narrower than preabdomen at 6th segment
(19) male *S5* with posteromedial unpigmented and finely haired area
(20) periandrium uniformly shortly haired
(21) male cerci fused with periandrium but projecting ventrally and so forming slender pointed processes below anal opening; each cercus with a long bristle
(22) hypandrium of medium length
(23) telomere medium-sized, distally widened and its posterior corner with a row of robust short spines
(24) phallophore with very long, slender and pointed epiphallus
(25) distiphallus simple
(26) postgonite slender, long, pointed, with 2 minute setulae on anterior margin
(27) ejaculatory apodeme small
(28) female *T7* short, transversely stripe-shaped
(29) female *T8* not divided but its lateral lobes strongly enlarged
(30) female *T9* very short and small, with some small dorsal setulae
(31) female *S7* large; *S8* narrower but rather long, both wholly covering the 9th segment and cerci in ventral view
(32) female *S9* small, rather dish-shaped
(33) spermathecae simply ball-shaped
(34) cerci short, fused with *T9*, each with 3 short, thicker setae and 1 small setula.

Discussion: The subgenus *Dentilimosina* subgen. nov. is easily separable from other subgenera included in the genus *Opalimosina* by an additional seta in front of basal *sc*. Further autapomorphic features can be found in the structure of the male genitalia (ventrally projecting cerci, rather large telomere, very long and pointed epiphallus) and female postabdomen (peculiar *T7*, very large *S7*, small but unmodified *S8*). It seems to be most closely allied to subgen. *Opalimosina* s. str. having similarly formed periandrium, female *T8* and similarly haired female cerci fused with *T9*. Its male *S5* resembles that of subgen. *Pappiella* but it might be due to convergent evolution.

The subgenus includes only the type-species, *O.* (*D.*) *denticulata* (Duda, 1924).

Opalimosina (Dentilimosina) denticulata (Duda, 1924), **comb. nov.**

(Figs. 984—986, 1008—1017)

Limosina (*Scotophilella*) *denticulata* Duda, 1924b: 174
Leptocera (*Scotophilella*) *denticulata*: Duda, 1925: 159 (key)
Leptocera (*Limosina*) *denticulata*: Richards, 1930: 295
Limosina (*Limosina*) *denticulata*: Duda, 1938: 119
Leptocera denticulata: Nartshuk, 1970: 347 (key)
Limosina denticulata: Papp, 1973c: 54 (key)

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Type material: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "2 6 20" (yellow card), "St. Wendel Rheinl. DUDA" and "*denticulata D.* ♂ d. DUDA" (DUDA's handwriting). Paralectotypes: 3 ♂ 2 ♀ with same locality but collected 3. 6. 1916 (1 ♂), 6. 4. 1919 (1 ♀), 10. 6. 1919 (1 ♂), 29. 7. 1919 (1 ♀) and 28. 5. 1920 (1 ♂) (ZMB).

Material examined (besides "Type material"): 20 ♂ 22 ♀

Spain: 5 ♂ 3 ♀ (JRO) — Grazalema nr. Ronda (ROHÁČEK leg.).

Belgium: 1 ♂ (IRB) — Bruxelles (COUCKE leg.).

Czechoslovakia: 6 ♂ 6 ♀ (JRO, SMO, VUP) — Bohemia: Doupovské hory Mts.-Lochotín (ROHÁČEK leg.); Moravia: H. Jeseník Mts.-Skřítek, Karolinka, Hukvaldy (ROHÁČEK leg.); Slovakia: Turček env., Lubochňa, V. Fatra Mts.-Rakytov Mt., N. Tatry Mts.-V. Boca, Belanské Tatry Mts.-Monkova dolina, Stakčín nr. Snina (ROHÁČEK leg.), Kr. Chlmec (LAŠTOVKA leg.).

Austria: 8 ♂ 13 ♀ (IZI, JRO) — Tyrol: Obergurgl Mt. (TROGER, STOCKNER leg.).

Description:

Male. Total body length 1.00—1.42 mm, general colour brownish black, dark greyish brown dusted, dull. Head short and high, brownish black. Frons with relatively narrow and long, subshining frontal triangle and somewhat silvery dusted interfrontalia; orbits and the rest of frons dark blackish grey or brown dusted and dull. *pvt* distinct although minute; 4 rarely 3 *if* of about equal length, but the most anterior often shorter; 4—6 small *ads* inside and below *ors*, some minute hairs also on face in front of anterior margin of eye. Frontal lunule and often also anterior margin of frons brown, dusted. Face and gena blackish brown, dark dusted and dull. Facial cavity black, shiny; carina strongly protruding between antennae. *g* comparatively thick. Eye small, oval, flat, its largest diameter about 1.7—1.8 times the narrowest genal width. Antennae strongly divergent, almost opposite, black, 3rd segment brown. Arista about 3.0 times as long as antenna, comparatively long and densely ciliate.

Thorax brownish black, pollinose, dull; mesonotum opalescent. 2 *hu*, the internal small but longer than 2 other microsetae on humeral callus. 2 *dc*, the anterior (situated just in suture) short, only a little longer than *dc* microsetae being stronger than *ac* hairs. 6—8 rows of *ac* microsetae, the medial prescutellar *ac* pair enlarged and as long as the anterior *dc*. Scutellum comparatively large, roundly elongate trapezoidal, with 2 pairs of *sc* of medium length and 1 small additional seta in front of basal *sc* on each side. Pleurae heavily dusted, dull and somewhat opalescent. 2 *stpl*, the anterior reduced to a microseta. Legs brownish black, trochanters, knees and tarsi brown. t_2 chaetotaxy (Fig. 986), *av* below middle of t_2 present. Ratio t_2: mt_2 = 1.91—2.06. Wing (Fig. 1008) with pale brownish membrane, veins pale brown, *C* darker and distinctly overpassing R_{4+5}. R_{2+3} apically curved to *C*. R_{4+5} slightly bent, apically more straight. Discal cell comparatively large, with short appendages of M_{1+2} and M_{3+4} beyond t_p. Alula small, narrow, acute. Wing measurements: length 1.04—1.32 mm, width 0.44—0.60 mm, *C*-index = 0.73—1.12, $t_a - t_p : t_p$ = 1.87—2.50. Halteres dark brown with blackish brown knob.

Abdomen blackish brown, greyish brown pollinose, subshiny. Terga sparsely shortly haired. *T1+2* simply pigmented and sclerotized. Sterna more densely but shortly haired. *S5* (Fig. 1013) with a large, semicircular, membraneous, pale area, densely overgrown by fine hairs. Lateral sclerotized parts only with some bristles.

Genitalia. Periandrium (Figs. 1011, 1012) rather short, sparsely uniformly haired. Cerci fused with periandrium but ventrally forming long slender and pointed projections. Each cercus with one longer bristle. Subanal plate deeply incised, intraperiandrial sclerite small. Hypandrium rod-like, longer than in subgen. *Pappiella*. Telomere (Fig. 1010) relatively large, distally widened; its anterior corner pointed; posterior corner with a group of robust short spines at ventral margin. Aedeagal complex (Fig. 1009). Phallophore projecting in extremely long but simple epiphallus being distally very slender, pointed and unpigmented. Distiphallus rather plain, formed by dorsal and ventral sclerite and by membraneous part between them. Postgonite slender, long, pointed, with 2 minute setulae on anterior margin. Ejaculatory apodeme small.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.18 to 1.61 mm. t_2 as in male, bristles only a little longer (Figs. 984, 985). Ratio t_2: mt_2 = 1.82—2.00. Wing measurements: length 1.19—1.46 mm, width 0.50—0.63 mm, *C*-index = 0.84—1.21, $t_a - t_p : t_p$ = 1.92—2.66.

Postabdomen (Figs. 1014—1016) with shiny *T6—T8*. *T6* large, with medial weakly sclerotized stripe. *T7* short, transversely stripe-shaped, incompletely divided by lateral transverse splits. *T8* dorsally short and stripe-shaped, laterally enlarged and reaching up to *S7*. *T9* very short, with number of minute setulae. *S6* normal, only posteriorly with a small medial pale pigmented area. *S7* large, convex, densely haired, anteromedially with a small incision. *S7* and *S8* wholly cover the apex of postabdomen in ventral view. *S8* small, but comparatively long, densely haired. *S9* small, rather dish-shaped. Spermathecae (Fig. 1017) simple, ball-shaped; sclerotized parts of ducts of medium length and somewhat bulbously dilated. Cerci short, fused with *T9*, each carrying 3 short thick setae and 1 minute setula.

Discussion: The species is the only known representative of the subgenus *Dentilimosina* subgen. nov. It resembles *O.* (*Pappiella*) *liliputana* (RONDANI) by its external features but the characters of its male genitalia and female postabdomen indicate more affinity to *Opalimosina* s. str. species (e.g. aedeagal complex, female cerci) and to *O.* (*Hackmanina*) *czernyi* (DUDA) (e.g. spermathecae, postgonite). The species is easily identifiable by the additional setula in front of basal *sc*, periandrium with ventrally projecting cerci, long epiphallus, characteristic telomere and peculiar female postabdomen (*T7*, *T8*, *T9*, *S7*, *S8*).

The identity of *O. denticulata* (DUDA) was confirmed by the study of the type material. It is interesting that I have examined 1 ♂ of this species determined by VILLENEUVE (in 1921) as male of *Limosina appendiculata* VILLENEUVE (synonym of *O. liliputana*).

Biology: Although DUDA (1924b, 1938) collected this species in a boggy leafy forest, it was clearly demonstrated by breedings (LAURENCE, 1955) that it is an exclusively coprophagous species. It prefers higher altitudes (up to 2,120 m — PAPP, 1976b, as *Limosina dentata* = lapsus) and was found on cow (LAURENCE, 1955; PAPP, 1975a, 1976b), horse, red deer, fallow deer and bear excrement (material examined). DUDA (1938) refers to a capture in a cave; I have caught 1 ♂ also on cattle bones. Adults occur in I—XI (combined data of above authors, RICHARDS, 1930 and material examined). LAURENCE (1955) determined the length of life-history to be 32—45 days under natural conditions.

Distribution: Known only from Europe — Spain (material examined, new), GB: England (RICHARDS, 1930; LAURENCE, 1955; RICHARDS, 1976), Belgium (material examin-

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ed, new), FRG (DUDA, 1924b, 1938), Poland (DUDA, 1938), Czechoslovakia (ZUSKA & LAŠTOVKA, 1969; PAPP, 1973c; ROHÁČEK, 1978b), Austria (PAPP, 1975a, 1976b — as *Limosina dentata*; TROGER & ROHÁČEK, 1980).

Subgenus ***Opalimosina*** s. str.

Type species: *Limosina mirabilis* COLLIN, 1902

Diagnosis: The subgenus can be defined by following features.

(1) *pvt* minute but always present
(2) no additional seta between *occi* and *occe*
(3) 3—4 *if* of about equal length or the foremost smaller
(4) 5—10 minute *ads* (including the hairs on face)
(5) *g* small
(6) eye small and flat
(7) thorax heavily pollinose, dull, but mesonotum often subshiny and opalescent
(8) 1 long (external) *hu* and 2—3 microsetae on humeral callus in addition
(9) 2 *dc*, the anterior short; sometimes an enlarged *dc* microseta in front of anterior *dc*
(10) 6 rows of *ac* hairs in front of suture
(11) scutellum comparatively large, roundly trapezoidal or triangular; *sc* of medium length
(12) 2 *stpl*, the anterior reduced to a microseta
(13) t_2 chaetotaxy (Figs. 1023—1028) similar in both sexes, t_3 (Figs. 1060—1063) with ventropreapical spur (sometimes very long — *O. mirabilis*)
(14) *C* produced beyond R_{4+5} (*O. mirabilis*) or reaching only to R_{4+5} (*O. collini* group)
(15) R_{4+5} slightly bent to *C*
(16) discal cell of medium length, usually narrow, with distinct appendages of M_{1+2} and M_{3+4} beyond t_p
(17) alula small, narrow, acute
(18) female postabdomen short and not narrower than preabdomen at 6th segment
(19) male *S5* comparatively long, regularly with a pair of conspicuous cuticular structures on posterior margin
(20) periandrium uniformly shortly haired
(21) male cerci fused with periandrium, but sometimes slightly produced ventrally (*O. mirabilis*, *O. calcarifera*), each with some setae one of which may be longer. Intraperiandrial sclerite and subanal plate present
(22) hypandrium of medium length or short
(23) telomere small, flat, posteriorly with some distinctive bristles or spines
(24) phallophore with robust, comparatively short epiphallus
(25) distiphallus rather complicated and well sclerotized
(26) postgonite comparatively short, with some indistinct setulae on outer side
(27) ejaculatory apodeme small
(28) female *T6* and *T7* simple
(29) female *T8* undivided but laterally extended and with slender ventrolateral appendages or projections reaching up to ventral side
(30) female *T9* small, reduced, fused with cerci or divided into 2 plates (*O. mirabilis*) and usually carrying some minute setulae
(31) female *S6* and *S7* simple
(32) female *S8* small but of complex and specifically characteristic form
(33) female *S9* reduced to horseshoe-shaped stripe-like sclerite
(34) spermathecae vesiculate with characteristically recurved sclerotized parts of ducts
(35) cerci short (except for *O. mirabilis*), fused with *T9* and armed by some small setulae (in *O. mirabilis* with a robust preapical spine).

Discussion: The subgenus *Opalimosina* s. str. is characterized by some features considered autapomorphic, e.g. t_3 with more or less distinct ventropreapical spur, male *S5* with a pair of cuticular structures on posterior margin, distiphallus strongly sclerotized and comparatively complicated, female *T8* with slender posteroventral projections, female *S8*

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of characteristic form and structure, spermathecae with recurved ducts etc. The small and plain telomere is also rather diagnostic. *Opalimosina* s. str. seems to be most closely related to subgen. *Dentilimosina* (cf. discussion under this subgenus). It includes 4 species in Europe and Palaearctic; they are fully enumerated in the discussion under the genus *Opalimosina* (p. 138).

Opalimosina (Opalimosina) mirabilis (COLLIN, 1902), comb. nov.

(Figs. 1018–1025, 1029–1035, 1063)

Limosina mirabilis COLLIN, 1902: 59; PAPP, 1973c: 53 (key); ROHÁČEK, 1975c: 118
Limosina (Scotophilella) mirabilis: DUDA, 1918: 134
Leptocera (Scotophilella) mirabilis: DUDA, 1925 (key); SPULER, 1925b: 76
Leptocera (Limosina) mirabilis: RICHARDS, 1930: 294; HARRISON, 1959: 266; RICHARDS, 1973: 370
Leptocera mirabilis: SÉGUY, 1934: 467; NARTSHUK, 1970: 345 (key)
Limosina (Limosina) mirabilis: DUDA, 1938: 132

Type material: Lectotype ♂ (des. by ROHÁČEK in 1980) labelled: "S. L. Newmark. Stable 8. 4. 96" (reverse of a circular label). Paralectotypes: 1 ♂ labelled "S L Newmarket 22/7/94"; 1 ♀ labelled "S. L. Newmarket 12. 5. 96" and 1 ♀ labelled "S. L. Newmarket 3/5/86" (all UMO).

Material examined (besides "Type material"): 142 ♂ 127 ♀

Spain: 3 ♂ (JRO) — Güejar Sierra nr. Granada, Grazalema nr. Ronda, Zanara nr. Ronda (ROHÁČEK leg.).

GDR: 1 ♂ (ZMB) — S. Harz-Ilfeld (DUDA leg.).

Czechoslovakia: 134 ♂ 121 ♀ (JRO, JZP, NMP, PFB, SMO, MHK, VUP) — Bohemia: Doupovské hory Mts.-Lochotín (ROHÁČEK leg.), Praha (REŠKA leg.), Praha-Kunratice (KOVÁŘ leg.), Praha-Libuš (VALEŠOVÁ leg.), Sulava nr. Praha (MACEK leg.), Poděbrady (JEŽEK leg.), Kundratice nr. Litoměřice (ZUSKA leg.), Dobříž (LAŠTOVKA leg.), Horní Počernice (ZUSKA leg.), Židlochovice (PULPÁN leg.), Vranov n. L. (LAŠTOVKA leg.), Žár (OŠMERA leg.), Veselí n. L. (KARAS leg.), Jind. Hradec (ZUSKA leg.), Palupín nr. Strmilov (ROHÁČEK leg.), Orlické hory Mts.-Říčky (MOCEK leg.); Moravia: Třešť, Řásná nr. Telč, Křtiny, Brno-Soběšice (ROHÁČEK leg.), Třebíč (ZUSKA leg.), Číchov nr. Třebíč (HAVLENA leg.), Lednice (VAŇHARA leg.), Pouzdřany, Opava, Brumovice nr. Opava, Úvalno nr. Krnov, H. Jeseník-Skřítek, Rejvíz, M. Jezerná Mt., Kepmík Mt., Hukvaldy (ROHÁČEK leg.), Val. Meziříčí (VALEŠOVÁ leg.) and localities given by ROHÁČEK (1980); Slovakia: Patince nr. Komárno, Turček env., Lubochňa, Slov. Raj-V. Sokol, N. Tatry Mts.-V. Boca, Turňa n. B., Slov. Kras-Hrušov, Brzotín (ROHÁČEK leg.), Lučenec (PULPÁN leg.), Belanské Tatry Mts.-Tristárská dolina, Plesnivec, Tatranská Kotlina (ROHÁČEK leg.), Spišská Nová Ves, Prešov (VERNER, LAŠTOVKA leg.).

Austria: 1 ♀ (IZI) — Tyrol: Obergurgl Mt. (TROGER leg.).

Hungary: 2 ♂ (JRO) — Aranyosgadány (PAPP leg.).

Bulgaria: 1 ♂ 3 ♀ (IZS) — Pirdop, Geleznitza, Izgrev- Strandja, Katschula-Strandja (BESHOVSKI leg.).

Denmark: 1 ♂ 2 ♀ (ZMK) — WJ: Holstebro (HANSEN leg.); F: Aerø (LUNDBECK leg.).

Description:

Male. Total body length 1.04–1.45 mm, general colour blackish brown, greyish brown dusted, dull. Head blackish brown. Frons with brownish black, long and shiny frontal triangle, distinct and silvery pollinose and glittering interfrontalia, orbits and ocellar triangle; rest of frons brown dusted and dull. *pvt* distinctly developed; 3–4 *if*, the most anterior usually small. 7–10 *ads* in a long row running on orbit and face. Frontal lunule, face and gena dark brown, greyish pollinose. Facial cavity brownish black and shiny, carina strongly protruding between antennal bases. *g* small. Eye relatively small, its largest diameter about 1.7 times the smallest genal width. Antennae blackish, 3rd segment often brown; arista about 3.0 times as long as antenna, relatively long ciliate.

Thorax blackish brown, heavily greyish brown dusted, dull. Mesonotum slightly opalescent, pleurae dull. 1 long external *hu* and 2–3 small setulae on humeral callus in addition. 2 *dc*, the anterior short (slightly longer than *dc* microsetae in front of it); 6 rows of *ac* hairs in front of suture; the prescutellar medial *ac* pair enlarged (sometimes longer than anterior *dc*). Scutellum large, roundly triangular, *sc* comparatively long. Pleurae with yellowish brown sutures between sclerites; 2 *stpl*, the anterior minute. Legs brown, fore coxa, trochanters, knees and tarsi paler. t_2 chaetotaxy (Fig. 1025), *av* below middle distinctly developed. t_3 with conspicuous long curved spine (Fig. 1063) arising below middle of ventral side. Ratio t_2: mt_2 = 1.91–2.09. Wing (Fig. 1029) with very pale brownish membrane, pale brownish hyaline veins; *C* brown and extended far beyond R_{4+5}. R_{2+3} apically more strongly bent up to *C*; R_{4+5} slightly bent to *C*. Discal cell of medium length, its outer corners usually rectangular and with short appendages of M_{1+2} and M_{3+4} beyond t_p. Alula small, narrow, pointed. Wing measurements: length 1.13–1.52 mm, width 0.51–0.67 mm, *C*-index = 0.96–1.17, t_a–t_p: t_p = 1.91–2.42. Halteres yellowish brown with brown knob.

Abdomen dark brown, greyish brown pollinose; terga sparsely and shortly haired, sterna with rather denser setosity. *T1+2* simply sclerotized and pigmented. *S4* (Fig. 1035) posteriorly membraneous and medially with an irregular darkly igmented disc. *S5* (Fig. 1034) characteristically pigmented, with an arc-shaped membraneous unpigmented stripe eparating the posteromedial part from the anterior part. The posteromedial part long densely haired (especially posteroaterally where hairs form a dense pale tuft) and carrying a pair of cuticular structures on posterior margin.

Genitalia. Periandrium (Figs. 1032, 1033) shortly but more densely haired than that of related species. Cerci distinctly projecting ventrally, each carrying a longer bristle besides 2 minute setulae. Hypandrium of medium length. Telomere (Fig. 1031) flat, with distinctly projecting anterior corner and simple posterior corner bearing 3 robust spine-like bristles. Aedeagal complex (Fig. 1030). Phallophore with simple slender epiphallus. Distiphallus rather simple and clearly different from that of related species. Postgonite slender and, contrary to allied species, apically tapering and with about 2 minute setulae on anterior margin. Ejaculatory apodeme small.

Female (Fig. 1022). Similar to male but differs as follows. Total body length 1.05–1.65 mm. t_2 chaetotaxy (Figs. 1023, 1024) as in male, but all bristles may be longer. Ratio t_2: mt_2 = 1.86–2.00. Wing measurements: length 1.09–1.47 mm, width 0.46–0.67 mm, *C*-index = 0.96–1.22, t_a–t_p : t_p = 1.84–2.60. *S4* simple.

Postabdomen (Figs. 1018–1020). *T6* and *T7* simple, but shorter than in related species. *T8* medially with an unpigmented semicircular area on anterior margin, laterally extended and with narrow ventral appendage. Both these appendages touching ventromedially. *T9* divided into 2 lateral plates, each partly fused with cercus and carrying some minute setulae. *S6* and *S7* simple, the latter shorter. *S8* with peculiar ventral protuberance. *S9* very short, stripe-shaped, with some setulae. Spermathecae (Fig. 1021) vesiculate, with impressed terminal tips and recurved sclerotized parts of ducts. Cerci much longer than those of related species, each armed by a conspicuous, thick, apically curved dorsopreapical spine, otherwise with some small hairs only.

Preimaginal stages: OKELY (1974: 50, Figs. 22–24) described and illustrated the puparium. It is characteristically bent at 6th segment, so that pupa lies in posterior two-thirds of the puparium. Anterior and posterior spiracular projections similar to those of *O. liliputana*. The egg, 3rd instar larva and its cephalopharyngeal skeleton have been described and figured by TENORIO (1968: 208, Fig. 4a–e, g).

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Discussion: The species is easily recognizable by the very long spine-like spur on t_3. Only *O. calcarifera* (ROHÁČEK) has similarly armed t_3 but its spur is much smaller and its *C* is not extended beyond R_{4+5}. *O. mirabilis* (COLLIN) differs from all European congeners also by long haired male *S5*, tapering postgonite, divided female *T9*, peculiar female *S8* and female cerci with distinctive spine.

The identity of the species is apparent from the original description but it was confirmed also by the study of the type material. It is rather surprising that so common and striking a species had not been described before COLLIN (1902). DUDA (1918, 1938) presumed that *Limosina obtusipennis* STENHAMMAR, 1854, might be identical with *O. mirabilis* but STENHAMMAR (1854) did not describe a peculiar spur on t_3 and the type material has not been preserved (KIM, 1972). Therefore, *Limosina obtusipennis* STENHAMMAR is considered as species dubia (see p. 158).

Biology: A very common and probably polysaprophagous (although predominantly coprophagous) species. It occurs on various excrement (cow, sheep, red deer, fallow deer, horse, bear, human) and especially on manure (breeding records — RICHARDS, 1930; PAPP, 1974c, 1975a, b), but develops also in decayed vegetation (breeding record — OKELY, 1974) and was also accidentally captured on decayed fungi and dead snails. The species often forms successful synanthropic populations — either symbovilous (on pasture lands, on dung-hills and in stables) or hemisynanthropic (on dump and compost heaps) ones. It was recorded as common in various plants of the food-processing industry (mainly in abattoirs, poultry farms, greengroceries — ZUSKA & LAŠTOVKA, 1969) and often penetrates into human's dwellings where it is found on window (RICHARDS, 1930; SÉGUY, 1934). Adults occur during the whole vegetation period (I—XI, combined data of various authors).

Distribution: Originally probably Holarctic, now cosmopolitan species, known from the majority of countries of Europe but recorded also from Canary Is. (FREY, 1936), Azores (HACKMAN, 1960), Nepal (DEEMING, 1969), Mongolia (PAPP, 1973a), USA (SPULER, 1925b), Canada (DUDA, 1925), Australia (RICHARDS, 1973), New Zealand (HARRISON, 1959; RICHARDS, 1973), Hawaii (TENORIO, 1968).

Opalimosina (Opalimosina) calcarifera (ROHÁČEK, 1975), **comb. nov.**

(Figs. 1026, 1036—1045, 1062)

Limosina calcarifera ROHÁČEK, 1975c: 115

Type material: Holotype ♂: Czechoslovakia, Slovakia, Slovenský kras, Hrušov, 2. 8. 1974, on decayed vegetation, J. ROHÁČEK leg. Genitalia dissected and preserved in a microvial with glycerine. Allotype ♀: Slovakia, Slovenský kras, nr. Silická ladnica, 3. 8. 1974, on human excrement, J. ROHÁČEK leg. Both type specimens preserved in alcohol (JRO).

Material examined (besides "Type material"): 2 ♂ 3 ♀

Czechoslovakia: 2 ♂ 3 ♀ (JRO, SMO) — Moravia: H. Jeseník Mts.-Rejvíz (ROHÁČEK leg.); Slovakia: Kremnické poh. Mts.-Turček env., Stakčín nr. Snina (ROHÁČEK leg.).

Description:

Male. Total body length 1.07—1.28 mm, general colour blackish brown, dusted, dull. Head short, blackish brown. Frontal triangle narrow, blackish and shiny, ocellar triangle, interfrontalia and orbits silvery grey pollinose and somewhat glittering; the rest of frons brown dusted and dull. *pvt* small (overlooked by ROHÁČEK, 1975c); 3—4 small *if*, the most anterior shorter than others; 5—6 minute *ads* and some hairs on face in front of anterior margin of eye in addition. Frontal lunule blackish brown, face and gena brown, pollinose and dull. Carina strongly protruding between antennae; facial cavity blackish and shiny. Eye rather small and flat, its diameter about 2.0 times as long as the narrowest genal width. Antennae dark brown, strongly divergent. Arista about 3.6 times as long as antenna, comparatively shortly ciliate.

Thorax brownish black, greyish brown pollinose. Mesonotum subshiny and somewhat opalescent, pleurae duller. 1 longer (external) *hu* and 2—3 additional setulae on humeral callus, one of them (true internal *hu*) may be somewhat longer than remaining 1—2. *2 dc*, the anterior short, in front of it there may be an enlarged *dc* microseta in addition. 6 rows of *ac* hairs in front of suture; the medial prescutellar *ac* pair somewhat enlarged. Scutellum roundly trapezoidal, *sc* of medium length. Pleurae with yellowish sutures between pleural sclerites. 2 *stpl*, the posterior long but thin, the anterior minute. Legs brown, trochanters and tarsi paler. t_2 chaetotaxy (Fig. 1026) as in related species, *av* below middle present. t_3 (Fig. 1062) with distinctive ventropreapical spur, much longer than in *O. collini* and *O. simplex* but essentially smaller than that of *O. mirabilis*. Ratio $t_2 : mt_2 = 1.88—2.13$. Wing (Fig. 1036) with light brownish membrane, veins brown. *C* not produced beyond R_{4+5}. R_{2+3} apically slightly bent to *C*; R_{4+5} also slightly curved up to *C*. Discal cell comparatively long and narrow, with short appendages of M_{1+2} and M_{3+4} beyond t_p. Alula small, narrow, acute. Wing measurements: length 0.98—1.06 mm, width 0.42—0.49 mm, *C*-index = 1.05—1.11, $t_a—t_p : t_p = 2.37—2.70$. Halteres with yellowish brown stem and blackish brown knob.

Abdomen blackish brown, greyish brown dusted, subshiny. Terga as well as sterna sparsely haired. *T1+2* simply pigmented and sclerotized. *S5* (Fig. 1041) posteromedially distinctly incised and with a pair of characteristic structures (composed of 3 small rows of cuticular excrescences), one on each side of this incision; otherwise very sparsely and shortly haired and with a pale, weakly sclerotized, semicircular area in the middle.

Genitalia. Periandrium (Figs. 1039, 1040) very sparsely and shortly haired. Cerci prolonged ventrally (essentially longer than those of related species) each carrying only 2 small setulae. Hypandrium short. Telomere (Fig. 1038) flat, with pointed anterior corner and posterior corner armed by 2 robust spines; ventrally with some hair-like bristles. Aedeagal complex (Fig. 1037). Phallophore with large, ventrally recurved epiphallus. Distiphallus well sclerotized, generally similar to that of related species but differing in detail. Postgonite distally widened and rounded, flat, with about 3 minute setulae on outer side (overlooked by ROHÁČEK, 1975c). Ejaculatory apodeme very small.

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Female. Similar to male except for the differences mentioned below. Total body length 1.22–1.40 mm. t_2 as in male, bristles slightly longer. Ratio t_2: mt_2 = 1.89–2.13. Wing measurements: length 0.99–1.18 mm, width 0.46–0.53 mm, *C*-index = 1.12–1.20, $t_a - t_p : t_p$ = 2.63–2.75. Preabdomen as in male.

Postabdomen (Figs. 1042–1044). *T6* distinctly shorter and narrower than *T7*. *T8* medially with a paler pigmented semicircular area on anterior margin; laterally extended and bearing thin ventral projection on each side. *T9* extremely reduced, represented by very thin stripe connecting bases of cerci. *S6* much wider than *S7*, the latter with a pair of longer posterior bristles. *S8* small, short, but rather characteristically formed. *S9* horseshoe-shaped, posteromedially very thin and stripe-like. Spermathecae (Fig. 1045) of irregular vesiculate shape, with slightly impressed tips and short, recurved sclerotized parts of ducts. Cerci long, compared to those of related species (owing to reduced *T9*), fused with the relic of *T9* and terminally carrying 4 minute setulae, 1 of which is distinctly shorter.

Discussion: The species is closely related to *O. simplex* (RICHARDS) and *O. collini* (RICHARDS) and forms with them a separate species-group characterized by similar venation of wing, t_2 chaetotaxy and generally similar male genitalia and female postabdomen. *O. calcarifera* (ROHÁČEK) differs from these relatives in having much longer ventropreapical spur on t_3, differently formed and armed male *S5*, telomere and postgonite, somewhat ventrally projecting male cerci, extremely reduced female *T9* and different female *S8*. *O. simplex* seems to be closer to *O. calcarifera* than *O. collini* because of the resemblance in the form of male *S5*, epiphallus and telomere.

Biology: Hitherto only few specimens were collected. The holotype was obtained from decayed vegetation but the species is probably predominantly coprophagous as are the related species. I have capture d2 ♂ 1 ♀ on cow excrement, 1 ♀ on red deer droppings, 1 ♀ on bear excrement and 1 ♀ (allotype) on human faeces. Adults were collected in VI–VIII; it is probably summer species.

Distribution: Czechoslovakia (ROHÁČEK, 1975c, 1978b) and Hungary (letter communication by Dr. L. PAPP, 1976).

Opalimosina (Opalimosina) simplex (RICHARDS, 1929), **comb. nov.**

(Figs. 5, 6, 1028, 1050–1059, 1061)

Leptocera grenstedi var. *simplex* RICHARDS, 1929: 175
Leptocera (*Limosina*) *grenstedi* var. *simplex*: RICHARDS, 1930: 296
Limosina (*Limosina*) *Grenstedi* var. *simplex*: DUDA, 1938: 125
Limosina simplex: ROHÁČEK, 1981: 166

Type material: Holotype ♀ labelled: "Essex: Epping Forest 18. ix. 1927. O. W. RICHARDS. B. M. 1929. 444", "*L. grenstedi* var. *simplex* RICHARDS ♀" and "Type" (on circular label with red margin); paratype ♀ labelled: "24/36", "Essex: Epping Forest 18. ix. 1927", "*L. simplex* ♀ paratype", "O. W. RICHARDS Coll. B. M. 1967–510" and "Para-type" (on circular label with yellow margin). Both in BML (examined).

Material examined (besides "Type material"): 22 ♂ 17 ♀

Czechoslovakia: 22 ♂ 17 ♀ (JRO, SMO) – Moravia: H. Jeseník Mts.-Rejvíz (ROHÁČEK leg.); Slovakia: Kremnické poh. Mts.-Turček env., V. Fatra Mts.-Suchá dolina, Slov. Kras-Hrušov, N. Tatry Mts.-V. Boca, Belanské Tatry Mts.-Šarpanec, Stakčín nr. Snina (ROHÁČEK leg.).

Description:

Male (mas novus). Total body length 1.03–1.33 mm, general colour brownish black, brownish grey pollinose, subshiny to dull. Head short, brownish black. Frons with blackish and shiny narrow frontal triangle, silvery glittering interfrontalia, orbits and ocellar triangle and dark brown dusted and dull rest. *pvt* small but always present; 3–4 *if*, the anterior usually shorter; 5–7 minute *ads* inside and below *ors*. Anterior margin of frons sometimes paler brown, but frontal lunule blackish. Face and gena dark brown, greyish brown pollinose. *g* short. Facial cavity blackish and shining; carina rather strongly protruding between antennae. Eye rather small and flat, its largest diameter about 2.0 times the narrowest genal width. Antennae strongly divergent, 3rd segment longer ciliate than arista. Arista about 3.0 times as long as antenna, relatively shortly ciliate.

Thorax brownish black, greyish brown pollinose. Mesonotum subshiny and opalescent, pleurae dull. 1 long (external) *hu* and 3 small microsetae on humeral callus. 2 *dc*, the anterior short. 6 rows of *ac* hairs in front of suture, sometimes only 4 rows between anterior *dc*. Prescutellar medial *ac* pair only slightly enlarged. Scutellum roundly trapezoidal, *sc* of medium length. Pleurae with yellowish sutures between sclerites and with 2 *stpl*, the anterior of which is reduced to a microseta. Legs dark brown, trochanters and tarsi paler brown. t_2 chaetotaxy as in related species (Fig. 1028). t_3 with small ventropreapical spur (Fig. 1061) as in *O. collini*. Ratio t_2: mt_2 = 1.64 to 1.96. Wing (Fig. 1050) with pale brownish membrane, veins brown. *C* hardly extended beyond R_{4+5} (in some specimens very slightly overpassing R_{4+5} – see e.g. RICHARDS, 1929, 1930). R_{2+3} basally parallel to *C*, apically curved up to *C*. R_{4+5} slightly bent to *C*. Discal cell comparatively long and narrow, usually with distinct appendages of both M_{1+2} and M_{3+4}. Alula small, narrow, pointed. Wing measurements: length 1.09–1.26 mm, width 0.46–0.57 mm, *C*-index = 0.96–1.20, $t_a - t_p : t_p$ = 2.40–3.00. Halteres with yellowish brown stem and dark brown knob.

Abdomen dorsally as well as ventrally sparsely haired, greyish brown pollinose, subshiny. *T1+2* simply pigmented and sclerotized. *S5* (Fig. 1055) comparatively shorter than that of related species, posteromedially without incision but with a pair of cuticular structures of complex and peculiar form. There is a pale, membraneous, transversely rhomb-like area in the middle of *S5*. Setosity of *S5* comparatively long and dense.

Genitalia. Periandrium (Figs. 1053, 1054) very shortly and sparsely haired. Cerci reduced and fused with periandrium. Hypandrium short. Telomere (Fig. 1052) not as flat as that of *O. collini* or *O. calcarifera*, externally more densely haired. Its anterior corner rather biapical, posterior corner with 4–5 thicker spines besides normal setae. Aedeagal complex (Fig. 1051). Phallophore resembles somewhat that of *O. calcarifera*, distiphallus on the contrary rather similar to that of *O. collini*. Postgonite with enlarged distal half being anteriorly hyaline and unpigmented and provided with fine tubercles and spines. Outer side of postgonite with about 4 minute setulae. Ejaculatory apodeme small.

Female. Head, thorax, legs, wing and preabdomen as in male unless mentioned otherwise. Total body length 1.37 to 1.71 mm. t_2 as in male but bristles may be somewhat longer. Ratio t_2: mt_2 = 1.62–2.04. Wing measurements: length 1.10–1.45 mm, width 0.47–0.65 mm, *C*-index = 0.96–1.11, $t_a - t_p : t_p$ = 2.08–2.55.

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Postabdomen (Figs. 1056–1058). *T6* and *T7* simple, sparsely haired. *T8* dorsomedially short but laterally posteriorly extended. *T9* completely fused with cerci and with a pair of small dorsal setulae. *S6* and *S7* simple, transversely oblong. *S8* of characteristic shape, with very deep oval posteromedial incision and with thin, band-shaped medial sclerite contacting with the posterior projections of *S8*. This stripe is usually invaginated into postabdomen and protrudes probably mainly during copulation or oviposition. *S9* horseshoe-shaped and very thin, especially posteriorly. Spermathecae (Fig. 1059) vesiculate, with somewhat impressed tips and short, recurved sclerotized parts of ducts. Cerci reduced, fused with *T9*, each carrying 4 small and short setulae, 2 most internal are thicker.

Preimaginal stages: The egg has characteristic anterior structure round the micropyle and finely pitted chorion Figs. 5, 6). Length 0.56 mm, width 0.15 mm.

Discussion: The species is clearly intermediate between its closest relatives *O. calcarifera* (ROHÁČEK) and *O. collini* (RICHARDS) and forms with them a separate *O. collini*-group (see discussion under *O. calcarifera*). *O. simplex* resembles *O. calcarifera* in its male *S5*, epiphallus and telomere, while *O. collini* has similarly formed ventropreapical spur on t_3, distiphallus and female *T9*. *O. simplex* can be separated from *O. calcarifera* by small spur on t_3 but from *O. collini* only by means of the male and female terminal structures (see key).

The species has been described as a variety of *Leptocera grenstedi* RICHARDS, 1929 (= synonym of *O. collini*, see below), but it is a distinct species which validity was confirmed by study of a series of recently found material containing also males.

Biology: *O. simplex* is predominantly coprophagous — I have collected it on cow (6 ♂ 10 ♀), sheep (1 ♂), red deer (13 ♂ 6 ♀) and bear (1 ♂) excrement; only 1 ♂ 1 ♀ was obtained from decayed vegetation. The type material (2 ♀) was also found on cow dung (RICHARDS, 1930). The species is probably confined to higher altitudes (my records are from 400 to 1,200 m). Adults were found only in months VI–XI; it seems therefore that *O. simplex* is a summer species as is *O. collini*.

Distribution: Known only from GB: England (RICHARDS, 1929, 1930, 1976) and Czechoslovakia (material examined, new).

Opalimosina (Opalimosina) collini (RICHARDS, 1929), **comb. nov.**

(Figs. 1027, 1046–1049, 1060, 1064–1069)

Leptocera collini RICHARDS, 1929: 175; NARTSHUK, 1970: 348 (key)
Leptocera (*Limosina*) *collini*: RICHARDS, 1930: 294
Limosina (*Limosina*) *collini*: DUDA, 1938: 116
Limosina collini: PAPP, 1973c: 43 (key)
Limosina collini: ROHÁČEK, 1975c: 118; 1981: 167
Leptocera grenstedi RICHARDS, 1929: 175; NARTSHUK, 1970: 347 (key)
Leptocera (*Limosina*) *grenstedi*: RICHARDS, 1930: 295
Limosina (*Limosina*) *grenstedi*: DUDA, 1938: 125

Type material:
Leptocera collini RICHARDS: Holotype ♀ labelled: "*collini* ♀ RICHARDS", "Essex: Epping Forest 18. ix. 1927, O.W. RICHARDS, B. M. 1929, 444" and "Type" (on circular label with red margin); paratype ♂ labelled: "24/42", "*L. collini* ♂ Paratype", "Essex: Epping For. 18. ix. 1927", "O. W. RICHARDS Coll. B. M. 1967–510" and "Para-type" (on circular label with yellow margin), both in BML (examined).
Leptocera grenstedi RICHARDS: Holotype ♀ labelled: "On cow dung Taunton July 24 1927 L. W. GRENSTED", "*L. grenstedi* ♀ Type" and "Type" (on circular label with red margin); paratype ♀ labelled: "Redesmere Cheshire Aug 5, 1927 L. W. GRENSTED", "on cow dung", "*L. grenstedi* ♀ paratype", "O. W. RICHARDS Coll. B. M. 1967–510" and "Para-type" (on circular label with yellow margin), both in BML (examined).

Material examined (besides "Type material"): 22 ♂ 25 ♀

GB: 1 ♂ (BML) — England: Bucks: Slough (RICHARDS leg.).

Czechoslovakia: 21 ♂ 25 ♀ (JRO, SMO) — Moravia: H. Jeseník Mts.-Rejvíz, Skřítek, Jezerník, Kepník Mt., Vsetínské vrchy-Karolinka (ROHÁČEK leg.); Slovakia: V. Fatra Mts.- Šiprúň Mt., Rakytov Mt., Lubochňa, N. Tatry Mts.- V. Boca, Slov. Kras-Bôrka, Silická planina, Belanské Tatry Mts.-Šarpanec, Stakčín nr. Snina (ROHÁČEK leg.).

Description:
Male. Total body length 0.95–1.10 mm, general colour brownish black, subshiny to dull, greyish brown dusted. Head short, blackish brown. Frons with narrow and somewhat shiny frontal triangle; orbits and interfrontalia silvery dusted and rather glittering, the rest of frons brown dusted and duller. *pvt* small but present; no additional seta between *occi* and *occe*. Approximately 4–5 very minute *ads* and some small hairs on face in front of eye in addition. 4 *if*, the most anterior usully shorter. Frontal lunule brownish black, face and gena brown, dusted. Carina strongly protruding between antennae, facii cavtiy blackish brown and shiny. Eye flat and rather small, its diameter about 1.8 times the narrowest genal width. Antennae blackish brown, 3rd segment brown and longer ciliate than the shortly pilose arista. Arista about 3.0 times as long as antenna.

Thorax brownish black, greyish brown dusted. Mesonotum subshiny and rather distinctly opalescent; pleurae dull, 1 long (external) *hu* and 3 additional microsetae on humeral callus. 2 *dc*, the anterior very short. 6 rows of *ac* hairs in front of suture but sometimes only 4 rows more posteriorly, between anterior *dc*. Scutellum elongate roundly trapezoidal, *sc* of medium length. Pleurae dark brown, with yellowish sutures. 2 *stpl*, the anterior very minute. Legs brown, trochanters and tarsi somewhat paler. t_2 chaetotaxy (Fig. 1027), *av* below middle of t_2 distinct. t_3 with small ventropreapical spur (Fig. 1060). Ratio t_2: mt_2 = 1.75–1.94. Wing (Fig. 1064) with pale brownish membrane and veins. *C* darker and usually not extended beyond R_{4+5}. R_{2+3} parallel to *C*, apically bent up to it. R_{4+5} slightly curved up to *C*. Discal cell relatively long and narrow, with rather long appendages of M_{1+2} and M_{3+4} beyond t_p. Alula small, narrow and pointed. Wing measurements: length 0.90–1.03 mm, width 0.38–0.45 mm, *C*-index = 1.11–1.37, t_a–t_p: t_p = 2.12–2.86. Halteres with yellowish brown stem and blackish brown knob.

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Abdomen brownish black, brownish grey dusted, subshiny; dorsally as well as ventrally very sparsely haired. *T1+2* simply pigmented and sclerotized. *S5* (Fig. 1069) with a deep posteromedial incision and with a pair of cuticular structures (each composed of a short row of excrescences and of a thin internal projection) on posterior margin. Disc of *S5* with an arc-shaped, pale pigmented stripe, otherwise comparatively long haired.

Genitalia. Periandrium (Fig. 1067–1068) very sparsely and shortly haired. Cerci reduced and fused with periandrium, each with some short hairs. Hypandrium short. Telomere (Fig. 1066) small, flat, ventrally setose; its posterior corner with a pair of long bristles; its outer side bare. Aedeagal complex (Fig. 1065). Phallophore with relatively straight epiphallus. Distiphallus similar to that of *O. simplex* but differing in detail. Postgonite distinctly curved, apically widened and with somewhat bumpy rounded margin. Ejaculatory apodeme minute.

Female. Similar to male but differs as follow. Total body length 1.10–1.36 mm. t_2 and t_3 chaetotaxy as in male. Ratio $t_2 : mt_2 = 1.77–1.86$. Wing measurements: length 1.01–1.16 mm, width 0.44–0.51 mm, *C*-index = 1.05–1.27, $t_a – t_p : t_p = 2.25–2.88$.

Postabdomen (Figs. 1046–1048). *T6* and *T7* simple, shortly haired. *T8* medially very short, laterally extended and terminated by thin band-like ventral projection. *T9* fused with cerci, dorsally usually with 2 pairs of setulae (the posterior pair longer), sometimes the anterior pair of setulae absent. *S6* and *S7* of subequal width, *S7* sometimes shorter. *S8* small, oval, with some minute setulae and in the middle with paler pigmented area; its posterior margin with 2 more heavily sclerotized bands. *S9* horseshoe-shaped, posteromedially very thin. Spermathecae (Fig. 1049) vesiculate, terminally wider and with impressed tips; sclerotized parts of ducts short and recurved. Cerci short, fused with *T9*; each cercus with 4 setulae, 1 of which is shorter.

Discussion: The species is most closely related to *O. simplex* (RICHARDS) but differs from it in the armature and pigmentation of male *S5*, telomere, straighter epiphallus, differently shaped postgonite, female *S8* and setosity of female cerci. *O. collini* (RICHARDS) is also smaller than *O. simplex* on average. *O. calcarifera* (ROHÁČEK) is also closely related but it has much longer ventropreapical spur on t_3 as well as clear differences in the male and female terminalia.

Leptocera grenstedi RICHARDS, 1929, is found to be synonymous with *O. collini* (RICHARDS). (1929) described it from 2 ♀ and distinguished it from *O. collini* mainly by the *C* overpassing R_{4+5}. Indeed, the *C* of the type specimens overpasses very slightly R_{4+5} (similarly as sometimes in *O. simplex*) but the examination of their postabdomina proved the undubitable conspecifity of *Leptocera grenstedi* with *O. collini*. Besides this, I have seen some other specimens with *C* slightly overpassing R_{4+5} collected together with typical specimens of *O. collini*. Thus, this feature is within the intraspecific variability of *O. collini*.

Biology: The species is strictly coprophagous, developing probably in the excrement of various herbivores (breeding record from cow dung — LAURENCE, 1955); it was hitherto recorded only from cow excrement (RICHARDS, 1930; LAURENCE, 1955; PAPP, 1971b,1973c) but I have also captured some specimens on sheep and red deer droppings. *O. collini* is a summer species — adults occur in V–IX. LAURENCE (1955) found that imagoes and larvae live predominantly in older (5–8 days old) dung and determined the length of the whole life-history to be 32–50 days under natural circumstances.

Distribution: Hitherto known only from Europe — GB: England (RICHARDS, 1929, 1930; LAURENCE, 1955; RICHARDS, 1976), Czechoslovakia (ROHÁČEK, 1978b) and Hungary (PAPP, 1971b, 1973c).

16. Genus ***Rudolfia*** **gen. nov.**

Type species: *Limosina rozkosnyi* ROHÁČEK, 1975

Diagnosis: The genus can be characterized as follows.

(1) *pvt* small but distinct
(2) 3 *if* of equal length or the foremost shorter
(3) 3–4 small *ads* inside and below *ors*
(4) *g* moderately long
(5) 2 *hu*, the internal reduced to a microseta
(6) 1 *dc* in prescutellar position
(7) 6–8 rows of *ac* hairs in front of suture
(8) prescutellar medial *ac* pair enlarged, almost as long as *dc*
(9) 2 *stpl*, the posterior long, the anterior very minute
(10) scutellum roundly triangular, comparatively large, *sc* long
(11) mesonotum pruinose and dull
(12) t_2 chaetotaxy as in Figs. 1070–1072
(13) *C* extending beyond R_{4+5}
(14) *C* with an unusual, long basal bristle

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(15) R_{4+5} slightly curved to C
(16) discal cell relatively long, with distinct appendages of M_{1+2} and M_{3+4} beyond t_p
(17) alula small, narrow
(18) $T1+2$ with transverse membraneous area partly separating $T1$ and $T2$ (Fig. 1082)
(19) female postabdomen short, not narrower than preabdomen at 6th segment
(20) male $S5$ with a pair of thorns lateral to posterior incision
(21) periandrium carrying a row of 3—4 long lateral bristles and 1 long laterocaudal seta
(22) male cerci large, distinctly differentiated from periandrium
(23) hypandrium relatively small
(24) telomere bizarre, hoe-shaped, with enlarged distal part
(25) aedeagal complex small
(26) phallophore without epiphallus, simple
(27) distiphallus weakly sclerotized
(28) postgonite simple, slender, with some setulae on anterior margin
(29) ejaculatory apodeme probably absent (not found)
(30) female $T8$ with tripartite pigmentation
(31) female $T9$ fused with cerci and with a pair of minute hairs
(32) female $S7$ large, prolonged posteriorly
(33) female $S8$ reduced to a small, spinulate plate
(34) female $S9$ formed as very narrow, horseshoe-shaped band
(35) a pair of small sclerites below gonopore carrying some short spines
(36) spermathecae disc-shaped or lenticular, with thin, long sclerotized parts of ducts
(37) female cerci modified to robust, curved spines, each carrying 2 minute preapical setulae.

Discussion: The genus *Rudolfia* gen. nov. differs essentially from all other genera of the subfamily Limosininae by many obviously autapomorphic features. It does not seem to be closely related to any other group of the previous genus *Limosina*, although some its external features (e. g. pruinose mesonotum, distinct *pvt*, wide female postabdomen, reduced setosity of female cerci) indicate a relationship to the genus *Telomerina* and/or *Opalimosina*. However, these similarities are probably due to convergent evolution of the above mentioned and, in my opinion, non-related groups.

The most significant characters distinguishing the genus *Rudolfia* from all discussed genera are: C basally with a long bristle, periandrium with lateral row of long bristles and strikingly developed cerci, large and complex telomere, weakly sclerotized distiphallus, reduced female $S8$, additional small sclerites below gonopore, female cerci of unusual thorn-like shape and fused with $T9$ etc.

The genus includes only *R. rozkosnyi* (ROHÁČEK, 1975). There are apparently no related species among all hitherto described species of the subfamily Limosininae.

Remarks: The genus is dedicated to my former teacher in dipterology, Doc. Dr. RUDOLF ROZKOŠNÝ, DrSc. (PFB) who introduced me to the study of the family Sphaeroceridae.

Rudolfia rozkosnyi (ROHÁČEK, 1975) **comb. nov.,**

(Figs. 1070—1084)

Limosina rozkosnyi ROHÁČEK, 1975c: 119

Type material: Holotype ♂: Czechoslovakia, Slovakia, Nízké Tatry Mts., Demänovská dolina (valley), 21. 8. 1973, on sheep dung, J. ROHÁČEK leg. (MMB); allotype ♀ same data as for holotype (MMB); paratypes: 4 ♂ 3 ♀ same data as for holotype (1 ♂ 1 ♀ MMB, 3 ♂ 2 ♀ JRO); 1 ♀ Slovakia, Nízké Tatry Mts., Vyšná Boca env., 20. 8. 1973, on cow dung, J. ROHÁČEK leg. (JRO).

Material examined (besides "Type material"): 65 ♂ 78 ♀

Czechoslovakia: 64 ♂ 76 ♀ (JRO, SMO, TMB, UMO) — Moravia: H. Jeseník Mts.-Jezernik, Kepmík Mt., Rychlebské hory Mts.-Nýznerov env. (ROHÁČEK leg.); Slovakia: Kremnické pohorie Mts.-Turček env., V. Fatra Mts.- Krásný kopec Mt., Belanské Tatry Mts.- Plesnivec, Biele pleso, Zadné Meďodoly (ROHÁČEK leg.).

Austria: 1 ♂ 2 ♀ (IZI) — Tyrol: Obergurgl Mt. (TROGER, STOCKNER leg.), Hohe Tauern Mts.- Badgastein (STOCKNER leg.).

Description:

Male. Total body length 1.23—1.60 mm, general colour brownish black, dull. Head short, high, blackish brown. Frons dull, frontal triangle and interfrontalia shining. Convergent *pvt* present but small, not crossed. 3 *if*, all of the same length, or the most anterior shorter; 3—4 small *ads* inside and below *ors*. Frontal lunule blackish brown, dull. Facial cavity brownish black, subshiny. Gena brown, dusted, dull; *g* moderately long. Eye rather small, flat, its diameter about 2.3 times the smallest genal width. Antennae brown, 3rd segment shorter ciliate than arista. Arista about 3.7 times as long as antenna, relatively long ciliate.

Thorax blackish brown, dull and pleurae especially heavily pruinose. Mesonotal chaetotaxy as defined for the genus. 2 *hu*, the internal minute. 1 *dc* in prescutellar position. 6—8 rows of *ac* hairs in front of suture; the medial prescutellar *ac* pair very enlarged, almost as long as *dc*. Scutellum comparatively large, rounded triangular; *sc* long. 2 *stpl*, the anterior very

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small. Legs brown, trochanters paler. f_2 ventrally with a short basal double row of short bristles. t_2 strikingly curved, its chaetotaxy as in Fig. 1070, ventrally with a row of short black spines and a short *va*. Ratio t_2: $mt_2 = 1.90-2.10$. Wing (Fig. 1073) very light yellowish brown, veins pale, hyaline brownish, only Cs_2 darker brown. *C* with an unusually long bristle at base which is, unlike *Halidayina*, oriented backwards not inwards, parallel with *C*. *C* produced beyond R_{4+5}. R_{4+5} moderately curved up to *C* and ending nearer the apex of wing than unpigmented apical fold of M_{1+2}. Discal cell rather narrow; its fore outer corner obtuse-angled, hind corner acute-angled. Both corners of discal cell with rather long venal processes of M_{1+2} and M_{3+4} beyond t_p. Wing measurements: length 1.25–1.55 mm, width 0.54–0.68 mm, *C*-index= 0.88–1.05, t_a-t_p: $t_p = 1.72-2.32$. Alula small, narrow. Halteres pale brownish.

Abdomen brown, somewhat shiny, dorsally sparsely, ventrally more densely haired. *T1+2* (Fig. 1082) with a transverse pale membraneous area incompletely separating *T1* and *T2*. *S5* (Fig. 1084) simply haired but posteriorly with a medial incision being armed by strong lateral thorns and centrally with a more darkly pigmented spot.

Genitalia very distinctive. Periandrium (Figs. 1077, 1078) with conspicuous cerci under the relatively small anal fissure. Cerci very finely pubescent, each with a stronger curved bristle. Periandrium laterally with a row of 3–4 long bristles, and one long laterocaudal bristle. Round anal fissure only shorter hairs. Telomere (Figs. 1075, 1076) large, very bizarre, in lateral view hoe-shaped. It is inserted in a deep lateral incision of periandrium and bears many processes and teeth. The lower part of telomere is horizontally enlarged and produced into a robust, finger-like, inwards directed process and a further strong, flat projection, oriented backwards. A slender long projection with 2 setae at the tip rises from ventral surface of telomere, further 2 finger-like processes projecting posteroventrally: there are several bristles and hairs round the latter 2 processes. The proximal part of telomere carries an anteroexternally directed spoon-shaped process the margin of which is provided with teeth. Aedeagal complex (Fig. 1074) small. Phallophore small, without epiphallus. Distiphallus weakly sclerotized, pale. Postgonites moderately long, slender, with about 3 setulae on anterior margin. Ejaculatory apodeme not found.

Female. Head, thorax, legs, wing and preabdomen as in the male unless mentioned otherwise. Total body length 1.33 to 1.85 mm. t_2 chaetotaxy (Figs. 1071, 1072) similar to that of male but t_2 not curved and ventrally with a short *av* in apical half and a long *va*. Ratio t_2: $mt_2 = 1.72-2.16$. Wing measurements: length 1.19–1.66 mm, width 0.50–0.69 mm, *C*-index = 0.82–1.08, t_a-t_p : $t_p = 1.87-2.30$.

Postabdomen (Figs. 1079–1081). *T7* with a pair of long dorsal bristles. *T8* with tripartite pigmentation, lateral parts of *T8* widened and paler pigmented. *T9* with medial unpigmented stripe and a pair of minute dorsal setulae. *S7* large, prolonged posteriorly on pale pigmented posterior margin and bearing a pair of long ventral bristles. *S8* reduced to a small, pale pigmented and rather irregularly shaped plate overgrown by minute spines. Under the gonopore a pair of small sclerites each carrying 2–3 short spines; also the membrane surrounding the gonopore distinctly shortly pubescent. Spermathecae (Fig. 1083) disc-shaped or lenticular, with terminal impression and long sclerotized ducts. Cerci modified in long, curved spines, each bearing 2 minute preapical setulae (overlooked in the original description).

Discussion: The species is distinguished by many unusual structures in the male and female terminalia but also the combination of the external features (long costal spine, wing venation, t_2 chaetotaxy, 1 *dc*, 1 long prescutellar *ac*) separates it from all known species of the previous genus *Limosina*.

Biology: *R. rozkosnyi* is apparently a mountaine species living exclusively in higher altitudes (from 800 m in Rychlebské hory Mts. to 1,950 m in Alps). It has been collected on sheep, cow, wild pig, bear and especially red deer excrement, 1 ♂ 4 ♀ also on mud and decayed vegetation and 1 ♂ 2 ♀ by means of the Malaise-trap. Adults were found to occur in VI–VIII. Judging from the collecting sites of the imagoes the larvae are probably coprophagous.

Distribution: Hitherto known only from several mountains in Czechoslovakia (ROHÁČEK, 1975c, 1978b) and Austria (TROGER & ROHÁČEK, 1980).

17. Genus ***Halidayina*** DUDA, 1918

Halidayina DUDA, 1918: 32 (as subgen.); 1925: 202 (as subgen.); 1938: 153 (as subgen.); SPULER, 1925a: 104 (as subgen.); RICHARDS, 1930: 304 (as subgen.); PAPP, 1973c: 37.
Type species: *Limosina spinipennis* HALIDAY, 1836 (mon.)

Diagnosis: The genus is characterized by the features mentioned below.

(1) *pvt* well developed, longer than rather small *occi*
(2) 5–6 *if* of about equal length
(3) 2 irregular rows of *ads*, the internal row inclinate, the external exclinate (Fig. 1085).
(4) *g* rather small
(5) 2 *hu*, the internal small but longer than thoracic microsetae
(6) 1 *dc* in prescutellar position
(7) 10–12 rows of *ac* hairs in front of suture
(8) 2 *stpl*, the anterior hair-like but relatively long, the posterior large
(9) scutellum shortly roundly triangular, *sc* short
(10) t_2 chaetotaxy as in Figs. 1086–1088, with characteristic group of posteroapical bristles
(11) *C* with a long and robust basal spine
(12) *C* overpassing R_{4+5}

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(13) R_{1+5} doubly sinuate and ending farther from the apex of wing than unpigmented apical fold of M_{1+2}
(14) discal cell short, outer corners with short processes of M_{1+2} and M_{3+4} beyond t_p
(15) alula relatively large and apically rounded
(16) female postabdomen distinctly narrower than preabdomen
(17) male *S5* with large semicircular membraneous area at posterior margin and a posteromedial comb of spines
(18) periandrium simply shortly haired
(19) telomere flat, with a ventral short and robust spine in anterior third
(20) phallophore rather long, epiphallus not developed
(21) distiphallus rather simple, with membraneous apex
(22) postgonite short, curved, with some minute hairs
(23) ejaculatory apodeme probably absent (not observed)
(24) female *T6* and *T7* simple, transversely oblong
(25) female *T8* large, laterally extended
(26) female *T9* short, small, with a pair of small dorsal hairs
(27) female *S6* and *S7* simple, transversely oblong, the latter shorter
(28) female *S8* rather long, convex ventrally
(29) female *S9* short, horseshoe-shaped
(30) spermathecae dish to tyre-shaped, with impressed terminal tips
(31) female cerci short, each with some sinuate hairs.

Discussion: The relationship of the genus *Halidayina* DUDA, 1918, remains rather obscure. Some genital parts superficially resemble those of non-related groups of the previous genus *Limosina*, for instance telomere (similar to *Spelobia*), male *S5* (similar to some *Opalimosina*), retractile female postabdomen and relatively simple aedeagal complex (seemingly similar to *Minilimosina*) but they differ in detail and it is concluded that this is a case of convergent evolution and that *Halidayina* is not closely related to these genera.

Halidayina seems to be allied to the genus *Elachisoma* RONDANI, 1880, having a similar inclinate row of *ads* on frons, large alula, rather similar wing venation etc. Moreover, COLLIN (1963: 36) described an interesting species *Elachisoma spinicostum* COLLIN from Italy which is somewhat intermediate between these genera, having wing venation more similar to *Halidayina* including the robust basal costal spine with 3 further curved spines on Cs_1 in addition, but head and mesonotal chaetotaxy as in typical *Elachisoma* (but with less numerous inclinate *ads*). However, analysis of the terminalia of this and other *Elachisoma* is necessary to elucidate the relationship of *Halidayina* and *Elachisoma*; a revision of the genus *Elachisoma* RONDANI of Europe is planned for a subsequent paper.

The genus *Halidayina* is easily separable from all other genera of the subfamily Limosininae in having very distinctive wing venation and large costal spine, characteristic chaetotaxy of frons and t_2, densely arranged rows of *ac* and only 1 *dc* as well as peculiarities in the male and female terminalia. The genus contains only the type species, *H. spinipennis* (HALIDAY, 1836) in the Palaearctic Region. I do not know any other species which might belong to it.

Halidayina spinipennis (HALIDAY, 1836)

(Figs. 1085–1098)

Limosina spinipennis HALIDAY, 1836: 331
Limosina (*Halidayina*) *spinipennis*: DUDA, 1918: 192; DUDA, 1938: 153
Leptocera (*Halidayina*) *spinipennis*: SPULER, 1925a: 116; DUDA, 1925: 202; RICHARDS, 1930: 305
Leptocera spinipennis: SÉGUY, 1934: 470; NARTSHUK, 1970: 345 (key)
Halidayina spinipennis: PAPP, 1973c: 38
Limosina akka RONDANI, 1880: 23

Type material:
Limosina spinipennis HALIDAY: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "*spinipennis*" (HALIDAY's handwriting), "HALIDAY 20. 2. '82" (registration No. of museum) and "Named by J. E. COLLIN". The specimen is rather mouldy but in good condition (NMI). Paralectotypes: 2 ♂ labelled: "Ireland" (green label), "HALIDAY 20. 2. '82" and "Named by J. E. COLLIN"; one of them with "spinipen" (COLLIN's handwriting) in addition (NMI).
Limosina akka RONDANI: Lectotype ♂ (des. by ROHÁČEK in 1979) labelled: "1926" (= a catalogue No. – red numeral on oval label); paralectotypes: 2 ♂ 5 ♀ and 1 specimen without abdomen labelled as lectotype (all MSF).

Material examined (besides "Type material"): 982 ♂ 1252 ♀

Spain: 6 ♂ 13 ♀ (JRO) – Güejar Sierra nr. Granada, Sierra Nevada Mts.-Llano Prado (ROHÁČEK leg.).
Belgium: 1 ♂ (IRB) – Bruxelles (SCHUYTS leg.).

DOI: 10.21248/contrib.entomol.33.1.3-195

Czechoslovakia: 964 ♂ 1216 ♀ (JRO, JZP, MMB, NMP, PFB, VUP, SMO, MHK) — Bohemia: Cheb (KOWARZ leg.), Doupovské hory Mts.-Lochotín, Louny (ROHÁČEK leg.), Zichovec nr. Slaný, Lešany nr. Benešov (KOVÁŘ leg.), Zvol nr. Zbraslav (ZUSKA leg.), Praha (PULPÁN leg.), Praha-Libuš (ZUSKA leg.), Praha-Ruzyně (ŠKALOUDOVÁ leg.), Kralupy (PULPÁN leg.), Poděbrady (JEŽEK leg.), Lysá n. L. (ZUSKA leg.), Vysoké Mýto (VALEŠOVÁ leg.), Veselí n. L. (KARAS leg.), Opočno, Choltice (MOCEK leg.), Palupín nr. Strmilov (ROHÁČEK leg.); Moravia: Třešť, Řásná nr. Telč, Mor. Krumlov, Brno-Soběšice (ROHÁČEK leg.), Brno-Černovice (CZIŽEK leg.), Mor. Kras-Babice, Podivín (ROHÁČEK leg.), Lednice (VAŇHARA leg.), Pohořelice (MOCEK leg.), Hodonín (PULPÁN leg.), H. Jeseník Mts.-Skřítek, Rejvíz, Kepmík Mt., Jezerník Mt., Kouty n. D., Brumovice nr. Opava, Klokočov (distr. Opava), Štity (distr. Šumperk), Hradec n. M., Hukvaldy, Karolinka (ROHÁČEK leg.), Val. Meziříčí (VALEŠOVÁ leg.); Slovakia: Lubochňa, V. Fatra Mts.-Suchá dolina, Rakytov Mt., Krásný kopec Mt., Turček env., V. Boca, N. Tatry Mts.- Ždiarské sedlo, Slov. Kras-Silická planina, Kečovo, Zadiel, Brzotín, Patince nr. Komárno (ROHÁČEK leg.), Banská Bystrica (LAŠTOVKA leg.), V. Tatry Mts.-Mengusovská dolina, Belanské Tatry Mts.-Plesnivec, Biele pleso, Monkova dolina, Tristárska dolina, Zadné Meďodoly, Tatranská Kotlina, Remetské Hámre (ROHÁČEK leg.), Spišská Nová Ves (VALEŠOVÁ leg.), Královský Chlmec (LAŠTOVKA leg.).

Austria: 8 ♀ (IZI) — Tyrol: Obergurgl Mt. (TROGER, STOCKNER leg.).

Jugoslavia: 1 ♂ (MMB) — Serbia: Kosovo-Metohija (LAUTERER leg.).

Bulgaria: 3 ♂ 10 ♀ (IZS) — G. Deltschev, Vitoscha-Bistritza, E. Rhodope Mts.-Gugutka, Plana, Burgas, Pamporovo, Banderitza, Pirdop (BESHOVSKI leg.).

Denmark: 3 ♂ 1 ♀ (ZMK) — NEZ: Utterslev Mose (SCHLICK leg.); B: Balka (MORTENSEN leg.).

Sweden: 1 ♂ (ZIL) — Lund (ZETTERSTEDT leg.).

Finland: 1 ♂ 2 ♀ (ZMH) — Al: Saltvik (FREY leg.); Ab: Kuustö (LUNDSTRÖM leg.).

USSR: 2 ♂ 2 ♀ (ZMH) — Ib: Walkjärvi (JOHANSSON leg.); Lr: Kuvernööri (HELLÉN leg.).

Description:

Male. Total body length 1.01—1.28 mm, general colour brownish black, brown pollinose, subshiny. Head (Fig. 1085) brown, with dull and brown dusted frons, frontal lunule, face and gena. Interfrontalia and narrow orbital stripes somewhat silvery glittering. Facial cavity black and more shiny. 5 *if* (exceptionally 6 *if*), almost of the same length or becoming somewhat longer anteriorly; *pvt* relatively large and longer than *occi*. 2 irregular rows of rather long *ads* reaching behind the upper *ors*; *g* short and not longer than peristomal hairs. Eye diameter about 2.4 times the smallest genal width, thus eye smaller that it is usual. Antennae black, arista about 3.0 times as long as antenna and relatively long ciliate.

Thorax brownish black, mesonotum shiny despite some pollination, pleurae more dusted and dull. Thoracic chaetotaxy as defined for the genus, the most diagnostic is only 1 *dc* and 10—12 rows of densely arranged *ac* hairs. Medial prescutellar *ac* pair somewhat enlarged. Scutellum shortly roundly triangular, *sc* relatively short. Pleurae with shiny spot at lower part of mesopleuron and upper part of sternopleuron behind fore coxa. Legs brownish black, coxae somewhat paler. t_2 chaetotaxy as in Figs. 1086—1088, the most characteristic is a group of posteroapical bristles. Ratio $t_2 : mt_2 = 1.90—2.22$. Wing (Fig. 1089) with pale brownish membrane and brown veins, *C* darkest. *C* basally with very long erect spine being normally directed posteriorly with respect to the fore wing margin. *C* produced beyond R_{4+5}; Cs_2 distinctly incrassate. R_{4+5} doubly sinuate, ending farther from the wing apex than the non-developed apical section of M_{1+2}. Discal cell rather short; also pigmented processes of M_{1+2} and M_{3+4} beyond t_p short. Alula large, rounded apically. Wing measurements: length 1.07 to 1.30 mm, width 0.43—0.57 mm, *C*-index = 0.79—0.96, $t_a—t_p : t_p = 1.50—1.90$. Halteres brown, knob darker.

Abdomen black, dorsally very sparsely haired and grey pollinose; sterna more densely but shortly haired. *T1+2* with somewhat paler pigmented and less sclerotized basal triangular area. *S5* (Fig. 1094) with large unpigmented and desclerotized semicircular medial area bearing a comb of spines with filiform tips on posterior margin. The desclerotized area overgrown by fine, pale hairs and spines.

Genitalia. Periandrium (Figs. 1092, 1093) small, simply and shortly haired. Cerci somewhat reduced, each with a caudal hair hardly longer than other hairs on periandrium. Hypandrium relatively small. Telomere (Fig. 1091) flat, with oval outline and a short, robust ventral spine in anterior third; also some small conical blunt spines in front of it. Micropubescence on telomere not developed. Aedeagal complex (Fig. 1090) with longer simple phallophore; distiphallus with well sclerotized basal part and membraneous apex. Postgonite short, rather wide, strongly bent and apically pointed. About 3 setulae in apical half of postgonite. Ejaculatory apodeme not observed.

Female. Similar to male but differs as follows. Total body length 1.03—1.63 mm. Chaetotaxy of t_2 as in male (Figs. 1086—1088) but all bristles generally longer. Ratio $t_2 : mt_2 = 1.86—2.21$. Wing measurements: length 1.17—1.66 mm, width 0.49—0.66 mm, *C*-index = 0.81—0.93, $t_a—t_p : t_p = 1.40—2.00$.

Postabdomen (Figs. 1095—1097) distinctly narrower than preabdomen, telescopically retracted into it in dry specimens though not as distinctly as in *Minilimosina* species. *T8* very widened laterally, in dry specimens wholly covering the small *T9* and cerci. *T9* pigmented only basally, with 2 small dorsal hairs. *S8* relatively large, convex ventrally, with some small bristles on posterior margin. *S9* very short, especially medially and horseshoe-shaped. Spermathecae (Fig. 1098) tyre to dish-shaped, with impressed terminal tips. Sclerotized parts of ducts not very long. Cerci short, each with a longer apical and 2 shorter preapical sinuate hairs besides some small lateral hairs.

Preimaginal stages: The puparium was described and illustrated by OKELY (1974: 54, Figs. 45—47). It somewhat resembles that of *Elachisoma aterrimum* (HALIDAY).

Discussion: The species seems to be very isolated in the subfamily Limosininae having no relatives in the Palaearctic fauna of Sphaeroceridae. It is a very distinct species and is easily identifiable by its peculiar costal bristle and characteristically sinuate R_{4+5}. It is possible that the species and in this way also the genus *Halidayina* represents a relative of the genus *Elachisoma* RONDANI (see above).

The identity of *H. spinipennis* (HALIDAY) has been verified by the examination of the types, but it can also be correctly identified from HALIDAY's (1836) original description. This is also the case with *Limosina akka* RONDANI, 1880, which had been synonymized with *H. spinipennis* by DUDA (1918). The present revision of type material of *L. akka* confirmed DUDA's (1918) conclusion.

Biology: This very common species is obviously polysaprophagous and develops in various decayed matter, i.e. excrement of diverse kinds (bred from cow dung by LAURENCE, 1955), compost heaps, decayed vegetation and carrion (RICHARDS, 1930; SÉGUY, 1934; DUDA, 1938; PAPP, 1973c etc.). I have caught it also on decayed fungi. LAURENCE (1955) found the duration of larval development to be 28—34 days if the female oviposited

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in June. The rapid development causes very high abundance and often mass-occurrence of this species on manure or excrement during the warm season. The adults occur during the whole year, most abundantly in the late spring and early summer (RICHARDS, 1930). ZUSKA & LAŠTOVKA (1969) recorded it as common in various food-processing plants, chiefly in abattoirs, poultry farms and greengroceries. It lives also frequently in dump heaps. Thus, it is thought to be a hemisynanthropic species which has large and successful synanthropic populations besides the free-living ones.

Distribution: A Holarctic species known from the majority of European countries and from Afghanistan (PAPP, 1976b, 1978a) and USA (SPULER, 1925a; RICHARDS, 1965). Regarding its synanthropy it is expected to be spread to further regions in the future.

Species dubiae et incertae sedis

Borborus pumilio MEIGEN, 1830: 208, spec. dubia et incerta sedis

In WINTHEM's collection (NMW) there is a series of specimens considered syntypes containing six different species of various genera (cf. DUDA, 1918: 226), but the original description does not enable one to decide from which of them *B. pumilio* was described. A further syntype deposited in Museum National à Histoire Naturelle (Paris) belongs to *Spelobia clunipes* (MEIGEN) (cf. VILLENEUVE, 1914).

Limosina minima MACQUART, 1835: 571, spec. dubia et incerta sedis

The species cannot be identified from the very brief original description (cf. DUDA, 1938: 159) and the location of the type material is unknown.

Limosina quisquilia HALIDAY, 1836: 330, spec. dubia et incerta sedis

Type material absent from HALIDAY's collection (NMI) and is apparently lost (COLLIN, 1914). DUDA (1938: 118) supposed it to be possibly conspecific with *Spelobia czizeki* (DUDA) while COLLIN (1914: 242) considered it might be *Leptocera* (*Opacifrons*) *coxata* (STENHAMMAR). Without study of the type material this problem cannot be solved.

Limosina fulvipes MEIGEN, 1838: 411, spec. dubia et incerta sedis

The original description is quite insufficient for correct recognition of this species; the location of the type material is unknown. DUDA (1938: 99), following VILLENEUVE (1914), placed it as a doubtful synonym of *Thoracochaeta zosterae* (HALIDAY).

Limosina glabra MEIGEN, 1838: 409, spec. dubia et incerta sedis

A doubtful species unrecognizable from the superficial and brief original description. Depository of type material unknown (cf. DUDA, 1918: 226).

Limosina impressa MEIGEN, 1838: 410, spec. dubia et incerta sedis

The species cannot be identified from the original description and the location of type material is unknown (DUDA, 1918: 227; 1938: 153).

Limosina pygmaea MEIGEN, 1838: 410, spec. dubia et incerta sedis

The same applies to this taxon as the foregoing species (DUDA, 1918: 226; 1938: 153).

Limosina rufipes MEIGEN, 1838: 411, spec. dubia et incerta sedis

According to DUDA (1918: 227; 1938: 98) this might be conspecific with *Thoracochaeta brachystoma* (STENHAMMAR) but this conjecture cannot be demonstrated without examination of the type material whose location is unknown.

Limosina scutellata MEIGEN, 1838: 409, spec. dubia et incerta sedis

Described from a single, probably immature specimen (DUDA, 1918: 226; 1938: 96) without abdomen. This type specimen is probably lost (see DUDA's, 1938 note on p. 96) and the species is not recognizable from the very imperfect original description.

Limosina tristis MEIGEN, 1838: 410, spec. dubia et incerta sedis

DUDA (1918: 167, 227) synonymized this species with *Spelobia clunipes* (MEIGEN) on the basis of examination of 3 specimens in NMW. However, later (DUDA, 1938:115) he rejected this synonymy because of a query concerning the origin of the specimens he had examined. The identity of *Limosina tristis* is not recognizable from the original description.

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Limosina aeneiventris STENHAMMAR, 1854, spec. dubia

Type material lost (KIM, 1972). According to the original description the species probably belongs to *Minilimosina* gen. nov. but its precise identity cannot be confirmed without study of the type material (cf. DUDA, 1938: 152).

Limosina curtiventris STENHAMMAR, 1854: 365, spec. dubia et incerta sedis

The type material is lost (KIM, 1972). As stated above (p. 17), this species was apparently described from a mixed series most probably containing *Terrilimosina schmitzi* (DUDA) or *T. racovitzai* (BEZZI) and *Apteromyia claviventris* (STROBL).

Limosina Diadema STENHAMMAR, 1854: 394, spec. dubia et incerta sedis

Type material is not preserved in STENHAMMAR's collection (ZIU), probably lost. The description of *Limosina diadema* partly corresponds to *Spelobia belanica* spec. nov. but its size and different colouring of the frons distinctly distinguish it (see p. 93). It is not possible even to place this species in a genus but it perhaps belongs to *Spelobia* SPULER or *Kimosina* gen. nov.

Limosina nitens STENHAMMAR, 1854: 368, spec. dubia

Type material lost (KIM, 1972). The species is not recognizable from the original description but probably belongs to the genus *Paralimosina* PAPP (see ROHÁČEK, 1977a and discussion on p. 53, 54).

Limosina obtusipennis STENHAMMAR, 1854: 422, spec. dubia

The species probably belongs to the genus *Opalimosina* gen. nov., but more precise identification is not possible without study of the type material which is, however, lost (KIM, 1972).

Limosina verticella STENHAMMAR, 1854: 366, spec. dubia

Type material has not been found at the present (KIM, 1972). The species might be relegable to the genus *Paralimosina* PAPP but its identity remains unknown (cf. ROHÁČEK, 1977a and discussion on p. 53, 56).

Leptocera (*Limosina*) *hungarica* VILLENEUVE, 1917: 143, spec. dubia

Limosina (*Limosina*) *hungarica*: DUDA, 1938: 127
Limosina hungarica: PAPP, 1973c: 56 (key)

The species was described from Hungarian specimens. It undoubtedly belongs to *Spelobia* (*Spelobia*) but its identity is not determinable from the original description. In my opinion it is probably conspecific either with *Spelobia villosa* (DUDA) or *S. simplicipes* (DUDA) but this cannot be proved without study of the type material which, however, has not been traced.

Limosina (*Leptocera*) *corrivalis* VILLENEUVE, 1918b: 81, spec. incerta sedis

Leptocera (*Scotophilella*) *corrivalis*: DUDA, 1925: 161 (key)
Limosina (*Limosina*) *corrivalis*: DUDA, 1938: 117
Leptocera corrivalis: NARTSHUK, 1970: 349 (key)
Limosina corrivalis: PAPP, 1973c: 56 (key)

This species is distinct and can be easily recognized from the original description but its generic position is not possible to elucidate without examination of material. However, the species has not been rediscovered since the date of its description and the location of the type material is unknown.

The species is brachypterous, with similar wing venation to *Spelobia pseudonivalis* (DAHL) but it is much smaller (1.3 mm) and has only 1 *dc*, different t_2 chaetotaxy (less numerous bristles on dorsal side and *av* below middle of t_2 absent), shorter *if* and black fore coxa. Because this species is certainly distinct, the full original description is presented below.

Description (VILLENEUVE, 1918b: 81): 2. *L. corrivalis*, n. sp. — *L. pseudonivali* (DAHL) apud SCHMITZ affinis et simillima, sed thoracis seta dorsocentrali unica et tibiarum intermediarum setis dorsalibus tantum duabus praecipue distincta — Long. circ. 1 mm. 3.

Le P. H. SCHMITZ, de Sittard (Hollande), a décrit récemment (1) une espèce gu'il croit identique à *Limosina pseudonivalis* DAHL, en se basant sur un photogramme de l'aile du type. Il me l'avait communiqué et, après examen, j'avais émis un doute à cause de quelques différences notamment dans le nombre et l'arrangement des soies des tibias intermédiaires. Mais, écrit le P. SCHMITZ, ,,die vorhandenen Unterschiede in der Schienenbeborstung und Körperfärbung werden wohl auf Rechnung der individuellen Variabilität zu setzen sein"(2).

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Cette conclusion, qui apparaissait comme trés risquée, est contredite par la découverte, dans les matériaux du Museum de Budapest, de quatre ♂ d'une espèce similaire dont je ne possédais qu'une ♀, espèce qui a, elle aussi, des ailes pareilles à celles de *L. pseudonivalis* DAHL et qui, néanmoins, s'éloigne de celle de SCHMITZ 1°) par les soies des bandelattes chitinées du front courtes et égales; 2°) une seule soie dorsocentrale au thorax, la préscutellaire, peu devéloppée; 3°) deux soies dorsales seulement aux tibias intermediaires, lesquelles sont de longueur moyenne et réunies par une rangée de petits cils à demi dressés; pas de soie médio-ventrae distincte. Cette nouvelle espèce, que j'appelle *Limosina corrivalis*, a, en outre, le front entièrement noir, les hanches noires aussi; la taille, enfin, est moindre. Il y a donc lieu de penser qu'autour de *L. pseudonivalis* DAHL plusieurs espèces, assurément très voisines, concourent a former un groupe à ailes semblables et manifestement réduites.

L. corrivalis est d'un brun noirâtre un peu brillant sur l'abdomen; sur le front, le triangle ocellaire est à peine luisant et l'on distinque assez bien deux bandes étroites plus mates et plus foncées en forme de V; le péristome, large en arrière comme la hauteur de l'oeil, est aussi foncé et mat, tands que le clypéus est assez brillant; le chète antennaire est long et nettement subplumeux. Le scutellum est nu, n'ayant que les deux soies marginales de chaque côté. L'abdomen du ♂ est cylindrique, épais et un peu ramassé, le tergite II est allongé, les deux suivants sont étroits et le dernier est bordé de blanc jaunâtre en arrière; l'hypopygium saillant et très renflé ne porte pas (au moins sur les individus que j'ai vus) les deux longues soies fines signalées par SCHMITZ chez son espèce. De profil, le ventre montre des poils dressés de la longueur de ceux qui garnissent les hanches et l'on voit immédiatement au devant du repli hypopygial une petite lamelle saillante, noire, presque carrée, ayant aussi des poils sur son bord antérieur. Les ailes sont grisâtres chez le ♂ et ne dépassent pas, ou à peine, l'extrémité de l'hypopygium; celles de la ♀ sont presque noirâtres, plus courtes que chez le ♂, comme remassées, laissant à découvert le dernier tergite abdominal et la moitié postérieure du préséndent. La nervation est la même que celle de *L. pseudonivalis* DAHL; mais il existe toutefois une variation notable dans la longueur du deuxiéme segment costal qui est, suivant les individus, sensiblement plus long que le troisième, ou moins long, ou bien égal. Les balanciers sont testacés, avec la massue allongée et rembrunie.

Pattes d'un noir foncé, plutôt épaisses; les trochanters, les genoux étroitment et les tarses en entier testacés. Tibias intermediaires ayant une soie dorsale au 1/4 proximal et une autre pareille au 1/5 distal; elles sont quelquefois surmontées d'une soie minuscule; épine médio-ventrale nulle ou absent. Protarse postérieure court, l'article suivant au moins deux fois aussi long.

Types dans ma collection et dans celle du Muséum de Budapest. – Patrie: Hongrie.

The following 4 species described as *Limosina* and considered species dubiae were found not to belong to the groups under study after revision of their type material:

Limosina pusio ZETTERSTEDT, 1847: 2496

Type material: Lectotype ♀ (des. by ROHÁČEK in 1979) labelled: "*L. pusio* ♀ ZETT. Esper." (ZIL). Paralectotype ♂ labelled: "*L. pusio* ♂ ZETT. Helgol. jun. 38, DAHLB." (ZIL).

The lectotype corresponds well with the original description and is conspecific with *Coproica pseudolugubris* (DUDA, 1923) which is thus a syn. nov. of *Coproica pusio* (ZETTERSTEDT, 1847) comb. nov. The male paralectotype does not agree with the original description (it has slightly recurved R_{4+5}) and is *Thoracochaeta brachystoma* (STENHAMMAR, 1854).

Limosina opacula STENHAMMAR, 1854: 389

Type material: Lectotype ♂ (des. by ROHÁČEK in 1979) unlabelled, located in drawer S23 (II) of STENHAMMAR's collection (see KIM, 1972). Paralectotypes: 3 ♂ 3 ♀ unlabelled and located with the lectotype (ZIU), 1 ♂ labelled: "6", "*opacula* STENH. ♂" (ZIL).

The species is conspecific with *Coproica vagans* (HALIDAY, 1833) as DUDA (1918, 1938) correctly presumed.

Limosina tarsata ZETTERSTEDT, 1855: 4796

The lectotype (♂) was designated by ROHÁČEK (1977c) who found this species to be *Leptocera* (*Rachispoda*) but did not determine its specific identity because of the poor condition of the lectotype (deposited in ZIL).

Limosina Stenhammari ZETTERSTEDT, 1860: 6400

The lectotype (♂) and 2 paralectotypes (all ZIL) were designated by ROHÁČEK (1977c) who found them to be *Coproica lugubris* (HALIDAY, 1836) and therefore synonymized *Limosina stenhammari* ZETTERSTEDT, 1860, with this species.

Systematic checklist of the previous genus *Limosina* MACQUART of Europe

This list follows the sequence of taxa adopted in the preceding text but some recently described species (PAPP, 1979b; PAPP & ROHÁČEK, 1981) are also included.

1. *Limosina* MACQUART, 1835
   Trichogaster LIOY, 1864
   Scotophilella DUDA, 1918
   silvatica (MEIGEN, 1830)

2. *Gigalimosina* gen. nov.
   flaviceps (ZETTERSTEDT, 1847), comb. nov.

3. *Apteromyia* VIMMER, 1929, gen. restit.
   Aptilomyia VIMMER, 1929 (lapsus) syn. nov.
   Všetečkiella VIMMER, 1931 (nom. nud.) syn. nov.
   claviventris (STROBL, 1909), comb. nov.
   brevispina DAHL, 1909
   všetečkai VIMMER, 1929

DOI: 10.21248/contrib.entomol.33.1.3-195

4. *Herniosina* gen. nov.
   bequaerti (VILLENEUVE, 1917), comb. nov.
      herniata DUDA, 1918
   horrida (ROHÁČEK, 1978), comb. nov.

5. *Terrilimosina* gen. nov.
   racovitzai (BEZZI, 1911), comb. nov.
      mikrops DUDA in CZIŽEK, 1916
      var. *Pokornyi* DUDA, 1918
   sudetica (ROHÁČEK, 1975), comb. nov.
   schmitzi (DUDA, 1918), comb. nov.

6. *Minilimosina* gen. nov.
   Minilimosina (*Svarciella*), subgen. nov.
   vitripennis (ZETTERSTEDT, 1847), comb. nov.
   splendens (DUDA, 1928), comb. nov.
   hackmani (ROHÁČEK, 1977), comb. nov.
   v-atrum (VILLENEUVE, 1917), comb. nov.
      guestphalica DUDA, 1918
   ismayi spec. nov.

   Minilimosina (*Minilimosina*) subgen. nov.
   tenera spec. nov.
   fungicola (HALIDAY, 1836), comb. nov.
      exigua RONDANI, 1880
   gemella spec. nov.
   trogeri spec. nov.
   parvula (STENHAMMAR, 1854), comb. nov.

   Minilimosina (*Allolimosina*) subgen. nov.
   albinervis (DUDA, 1918), comb. nov.
   alloneura (RICHARDS, 1952), comb. nov.
   secundaria (DUDA, 1918), comb. nov.

7. *Xenolimosina* gen. nov.
   setaria (VILLENEUVE, 1918), comb. nov.
      setaria DUDA, 1918

8. *Paralimosina* PAPP, 1973
   Paralimosina (*Paralimosina*) PAPP, 1973
   fucata (RONDANI, 1880), comb. nov.
   subcribrata (ROHÁČEK, 1977), comb. nov.
   macedonica (ROHÁČEK, 1977), comb. nov.
   trichopyga (RICHARDS, 1952), comb. nov.
   kaszabi PAPP, 1973
      latigena ROHÁČEK, 1977, syn. nov.

   Paralimosina (*Canarisina*) subgen. nov.
   beckeri (DUDA, 1918), comb. nov.
   gomerensis PAPP & ROHÁČEK, 1981
   franzi PAPP & ROHÁČEK, 1981
   pilifemorata PAPP & ROHÁČEK, 1981
   anaptera PAPP & ROHÁČEK, 1981

9. *Spelobia* SPULER, 1924, nom. restit., stat. nov.
   Spelobia (*Eulimosina*) subgen. nov.
   ochripes (MEIGEN, 1830), comb. nov.
      fulviceps RONDANI, 1880

   Spelobia (*Spelobia*) SPULER, 1924
   clunipes (MEIGEN, 1830), comb. nov.
      crassimana HALIDAY, 1836
      pygmaea ZETTERSTEDT, 1838
      nigrinervis DAHL, 1909
   manicata (RICHARDS, 1927), comb. nov.
   faeroensis (DEEMING, 1966), comb. nov.
   baezi (PAPP, 1977), comb. nov.
   palmata (RICHARDS, 1927), comb. nov.
      leruthi DUDA, 1938
   talparum (RICHARDS, 1927), comb. nov.
   talis spec. nov.
   czizeki (DUDA, 1918), comb. nov.
   pseudonivalis (DAHL, 1909), comb. nov.
   villosa (DUDA, 1918), comb. nov.
   quaesita spec. nov.
   simplicipes (DUDA, 1925), comb. nov.
      simplicimana DUDA, 1918, preocc.
   pseudosetaria (DUDA, 1918), comb. nov.
      penetralis COLLIN, 1925
   rufilabris (STENHAMMAR, 1854), comb. nov.
   ibrida spec. nov.
   luteilabris (RONDANI, 1880), comb. nov.
      simplicimana RONDANI, 1880
   ulla spec. nov.
   nana (RONDANI, 1880), comb. nov.
   parapusio (DAHL, 1909), comb. nov.
      rustica VILLENEUVE, 1918
   belanica spec. nov.
   pappi spec. nov.
   cambrica (RICHARDS, 1929), comb. nov.

   Spelobia (*Bifronsina*) subgen. nov.
   bifrons (STENHAMMAR, 1854), comb. nov.
      puerula RONDANI, 1880

DOI: 10.21248/contrib.entomol.33.1.3-195

10. *Pullimosina* gen. nov.
Pullimosina (*Dahlimosina*) subgen. nov.
dahli (DUDA, 1918), comb. nov.
karelica (PAPP, 1979), comb. nov.
Pullimosina (*Pullimosina*) subgen. nov.
heteroneura (HALIDAY, 1836), comb. nov.
jeanneli BEZZI, 1911
antennata (DUDA, 1918), comb. nov.
moesta (VILLENEUVE, 1918), comb. nov.
pullula (ZETTERSTEDT, 1847), comb. nov.
meijerei (DUDA, 1918), comb. nov.

11. *Spinilimosina* gen. nov.
brevicostata (DUDA, 1918), comb. nov.

12. *Chaetopodella* DUDA, 1920
Gyretria ENDERLEIN, 1938
scutellaris (HALIDAY, 1836)

13. *Kimosina* gen. nov.
Kimosina (*Collimosina*) subgen. nov.
spinosa (COLLIN, 1930), comb. nov.
Kimosina (*Alimosina*) subgen. nov.
empirica (HUTTON, 1901), comb. nov.
pectinifera VILLENEUVE, 1918
cadaverina DUDA, 1918
Kimosina (*Kimosina*) subgen. nov.
plumosula (RONDANI, 1880), comb. nov.
pappi spec. nov.
glabrescens (VILLENEUVE, 1917), comb. nov.
pteremoides PAPP, 1973, syn. nov.
ciliata (DUDA, 1918), comb. nov.
longisetosa (DAHL, 1909), comb. nov.

14. *Telomerina* gen. nov.
antonini spec. nov.
ursina spec. nov.
eburnea spec. nov.
flavipes (MEIGEN, 1830), comb. nov.
minutissima ZETTERSTEDT, 1847
retracta RONDANI, 1880
? *ventruosella* VENTURI, 1965
pseudoleucoptera (DUDA, 1924), comb. nov.

15. *Opalimosina* gen. nov.
Opalimosina (*Pappiella*) subgen. nov.
liliputana (RONDANI, 1880), comb. nov.
appendiculata VILLENEUVE, 1918
Opalimosina (*Hackmanina*) subgen. nov.
czernyi (DUDA, 1918), comb. nov.
lambi DUDA, 1928
Opalimosina (*Dentilimosina*) subgen. nov.
denticulata (DUDA, 1924), comb. nov.
Opalimosina (*Opalimosina*) subgen. nov.
mirabilis (COLLIN, 1902), comb. nov.
calcarifera (ROHÁČEK, 1975), comb. nov.
simplex (RICHARDS, 1929), comb. nov.
collini (RICHARDS, 1929), comb. nov.
grenstedi RICHARDS, 1929

16. *Rudolfia* gen. nov.
rozkosnyi (ROHÁČEK, 1975), comb. nov.

17. *Halidayina* DUDA, 1918
spinipennis (HALIDAY, 1836)
akka RONDANI, 1880

Species dubiae and/or incertae sedis:

Borborus pumilio MEIGEN, 1830
Limosina minima MACQUART, 1835
Limosina quisquilia HALIDAY, 1836
Limosina fulvipes MEIGEN, 1838
Limosina glabra MEIGEN, 1838
Limosina impressa MEIGEN, 1838
Limosina pygmaea MEIGEN, 1838
Limosina rufipes MEIGEN, 1838
Limosina scutellata MEIGEN, 1838
Limosina tristis MEIGEN, 1838
Limosina aeneiventris STENHAMMAR, 1854
Limosina curtiventris STENHAMMAR, 1854
Limosina diadema STENHAMMAR, 1854
Limosina nitens STENHAMMAR, 1854
Limosina obtusipennis STENHAMMAR, 1854
Limosina verticella STENHAMMAR, 1854
Leptocera (*Limosina*) *hungarica* VILLENEUVE, 1917
Limosina (*Leptocera*) *corrivalis* VILLENEUVE, 1918

Summaries

Zusammenfassung

In Form einer Monographie wurden die europäischen Arten bearbeitet, die zur bisherigen Gattung *Limosina* MACQUART (sensu HACKMAN, 1969 a) gehören. Dieses Taxon erwies sich als polyphyletisch und wurde nach Gesichtspunkten der phylogenetischen Klassifikation in 17 Gattungen mit insgesamt 81 europäischen Arten gegliedert. Elf Gattungen und 11 Untergattungen werden als neu beschrieben: *Gigalimosina* **gen. nov.**, *Herniosina* **gen. nov.**, *Terrilimosina* **gen. nov.**, *Minilimosina* **gen. nov.**, *Minilimosina* (*Svarciella*) **subgen. nov.**, *Minilimosina* (*Allolimosina*) **subgen. nov.**, *Xenolimosina* **gen. nov.**, *Paralimosina* (*Canarisina*) **subgen. nov.**, *Spelobia* (*Eulimosina*) **subgen. nov.**, *Spelobia* (*Bifronsina*) **subgen. nov.**, *Pullimosina* **gen. nov.**, *Pullimosina* (*Dahlimosina*) **subgen. nov.**, *Spinilimosina* **gen. nov.**, *Kimosina* **gen. nov.**, *Kimosina* (*Collimosina*) **subgen. nov.**, *Kimosina* (*Alimosina*) **subgen. nov.**, *Telomerina* **gen. nov.**, *Opalimosina* **gen. nov.**, *Opalimosina* (*Pappiella*) **subgen. nov.**, *Opalimosina* (*Hackmanina*) **subgen. nov.**, *Opalimosina* (*Dentilimosina*) **subgen. nov.**, und *Rudolfia* **gen. nov.** Die anderen hierzu gehörenden Gattungen werden redeskribiert: *Limosina* MACQUART, 1835; *Apteromyia* VIMMER,

DOI: 10.21248/contrib.entomol.33.1.3-195

1929, **gen. restit.**; *Paralimosina* PAPP, 1973; *Spelobia* SPULER, 1924, **nom. restit.**, **stat. nov.**; *Chaetopodella* DUDA, 1920; *Halidayina* DUDA, 1918.

14 neue Arten werden beschrieben (*Minilimosina* 4, *Spelobia* 6, *Kimosina* 1, *Telomerina* 3), die anderen Spezies vollständig redeskribiert. Vier neue Synonymien wurden festgelegt; zahlreiche Arten (neben jenen, die in der Monographie enthalten sind) sind in neuen Kombinationen fixiert. Alles erreichbare Typenmaterial der europäischen Arten einschließlich der Synonyma wurde revidiert, eine Anzahl Lectotypen designiert und auf diese Weise der Status einzelner Arten festgelegt. Die Beschreibung jeder Art wird durch zahlreiche Zeichnungen ergänzt, durch Angaben zur Morphologie der praeimaginalen Stadien, zur Biologie und Verbreitung sowie durch die Erörterung der verwandtschaftlichen Beziehungen.

Für alle behandelten Arten wurden Bestimmungsschlüssel erarbeitet. Der allgemeine Teil enthält eine Zusammenfassung der Angaben grundsätzlicher Art zum historischen Verlauf der Erforschung, zur Morphologie, Biologie, Zoogeographie und Phylogenie der untersuchten Gruppen.

Резюме

В виде монографии обработаны европейские виды, относящиеся к ранее известному роду *Limosina* MACQUART (sensu HACKMAN, 1969 a). Этот таксон оказался полифилетическим и подразделился согласно аспектам филогенетической классификации на 17 родов с 81 европейским видом. 11 родов и 11 подродов описаны как новые: *Gigalimosina* **gen. nov.**, *Herniosina* **gen. nov.**, *Terrilimosina* **gen. nov.**, *Minilimosina* **gen. nov.**, *Minilimosina* (*Svarciella*) **subgen. nov.**, *Minilimosina* (*Allolimosina*) **subgen. nov.**, *Xenolimosina* **gen. nov.**, *Paralimosina* (*Canarisina*) **subgen. nov.**, *Spelobia* (*Eulimosina*) **subgen. nov.**, *Spelobia* (*Bifronsina*) **subgen. nov.**, *Pullimosina* **gen. nov.**, *Pullimosina* (*Dahlimosina*) **subgen. nov.**, *Spinilimosina* **gen. nov.**, *Kimosina* **gen. nov.**, *Kimosina* (*Collimosina*) **subgen. nov.**, *Kimosina* (*Alimosina*) **subgen. nov.**, *Telomerina* **gen. nov.**, *Opalimosina* **gen. nov.**, *Opalimosina* (*Pappiella*) **subgen. nov.**, *Opalimosina* (*Hackmanina*) **subgen. nov.**, *Opalimosina* (*Dentilimosina*) **subgen. nov.**, *Rudolfia* **gen. nov.** Остальные относящиеся к ним роды были переописаны: *Limosina* MACQUART, 1835; *Apteromyia* VIMMER, 1929, **gen. restit.**; *Paralimosina* PAPP, 1973; *Spelobia* SPULER, 1924, **nom. restit.**, **stat. nov.**; *Chaetopodella* DUDA, 1920; *Halidayina* DUDA, 1918.

Описаны 14 новых видов (*Minilimosina* 4, *Spelobia* 6, *Kimosina* 1, *Telomerina* 3), остальные виды были полностью переописаны. Установлены 10 новых синонимий; многочисленные виды (кроме тех, которые включены в монографию) фиксированы в новых комбинациях. Проведена ревизия всех имеющихся в распоряжении типов европейских видов, включая синонимы, обозначен ряд лектотипов и таким образом установлен статус отдельных видов. Описание каждого вида дополняется многочисленными рисунками, данными о морфологии преимагинальных стадий, о биологии и распространении, а также обсуждением родственных отношений.

Для всех обработанных видов были разработаны определительные ключи. Общая часть содержит сводные данные об истории научно-исследовательских работ, о морфологии, биологии, зоогеографии и филогении изученных групп.

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Index

This index is restricted to taxonomic names associated only with Sphaeroceridae; all the names dealing with other groups are excluded. Accepted (valid) taxonomic names for genera, subgenera and species, including those for species dubiae, are in italics; synonyms are marked by asterics. Boldface numbers in front of the colon indicate the volume of the „Beiträge zur Entomologie"; italicized numbers indicate the principal page references (descriptions). The concluding systematic checklist is not indexed.

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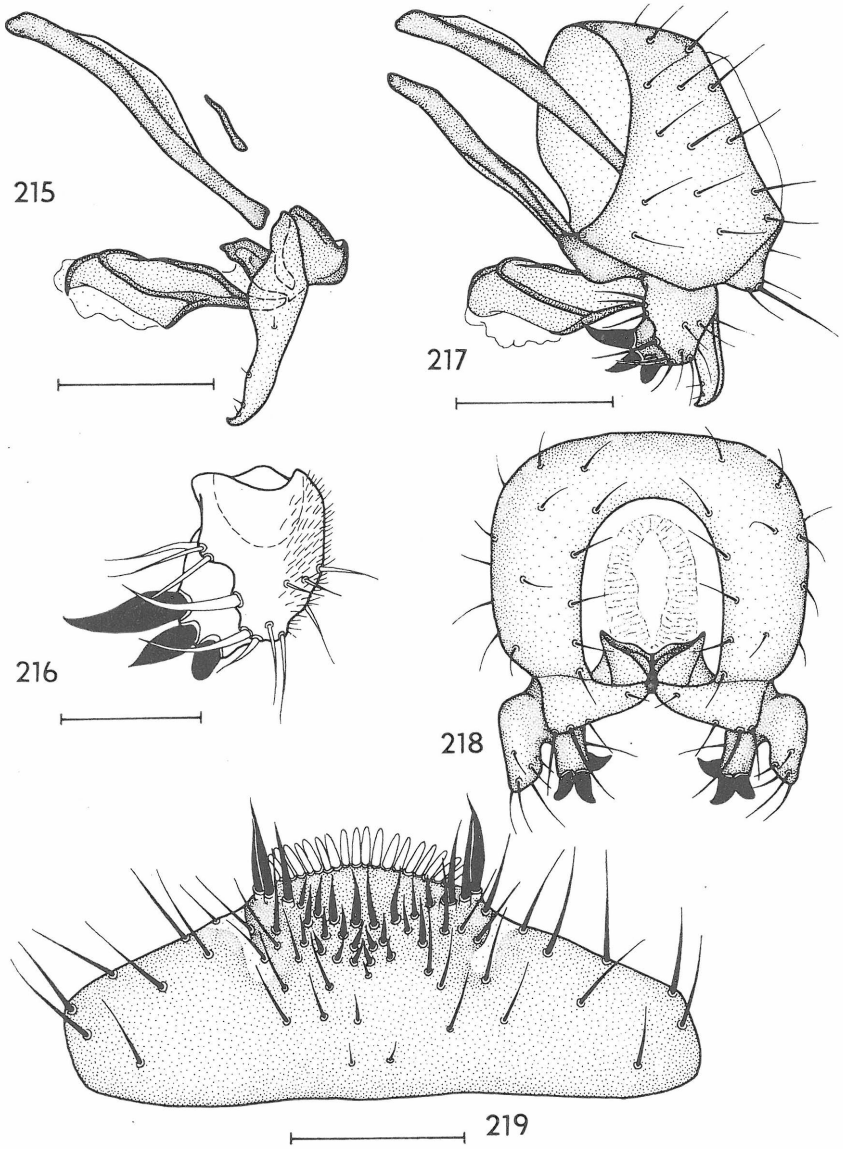
Emendations to Part I

(Beitr. Ent. **32**, 195–282).

Users of the monograph are cautioned that several printing errors involved in the abbreviations (p. 199) are to be corrected as follows:

OR — orbit (not orbitiste)
NMP — Národní muzeum, Praha (Czechoslovakia) (not NMW)
NMW — Naturhistorisches Museum, Wien (Austria) (not NME)



Figs. 215–219. *Minilimosina* (*S.*) *v-atrum* (VILLENEUVE). 215 – aedeagal complex laterally (only left postgonite figured); 216 – telomere; 217 – male genitalia laterally; 218 – dtto caudally (aedeagal complex omitted); 219 – *S5*. Figs. 217, 218 based on specimens from Czechoslovakia, others on specimens from Finland. Scales: Figs. 215, 217–219 = 0.1 mm, Fig. 216 = 0.05 mm.

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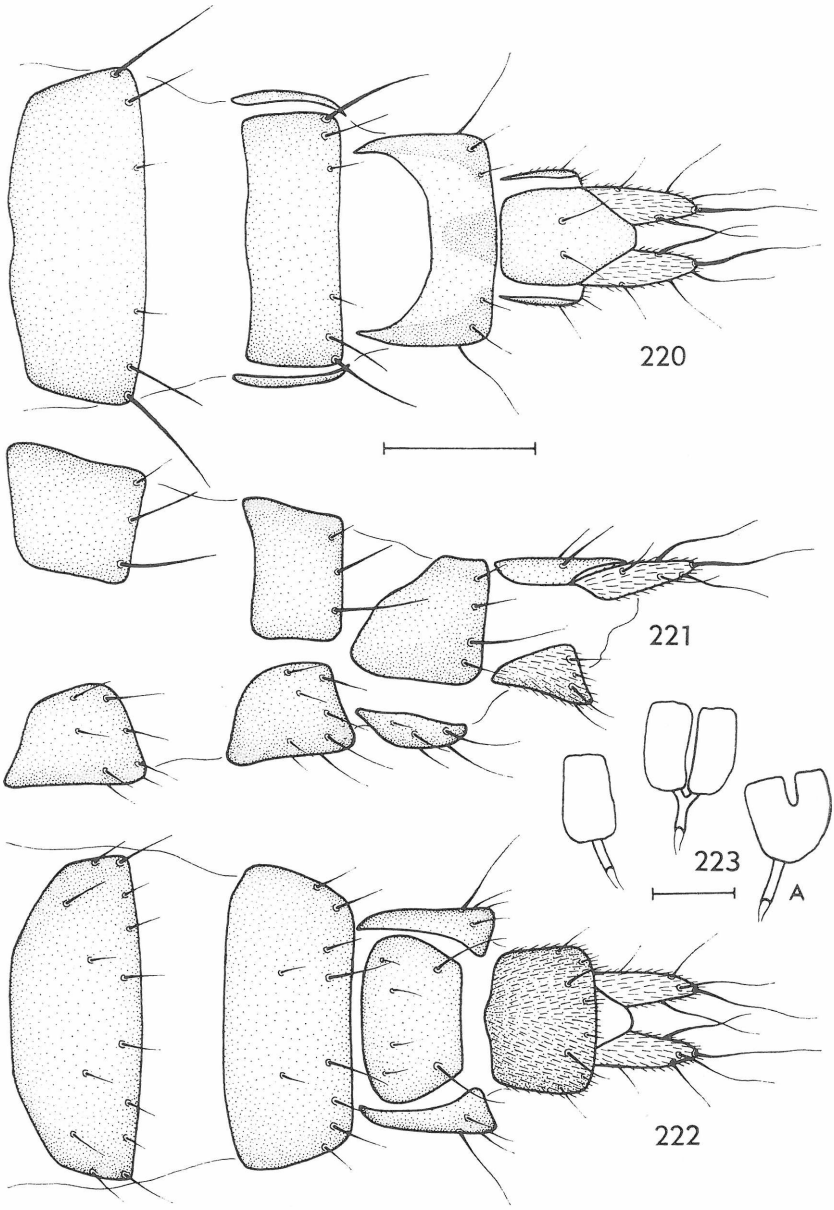
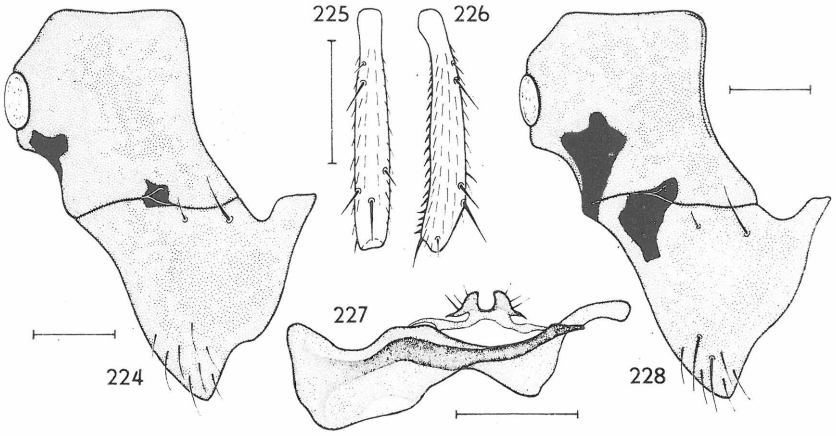
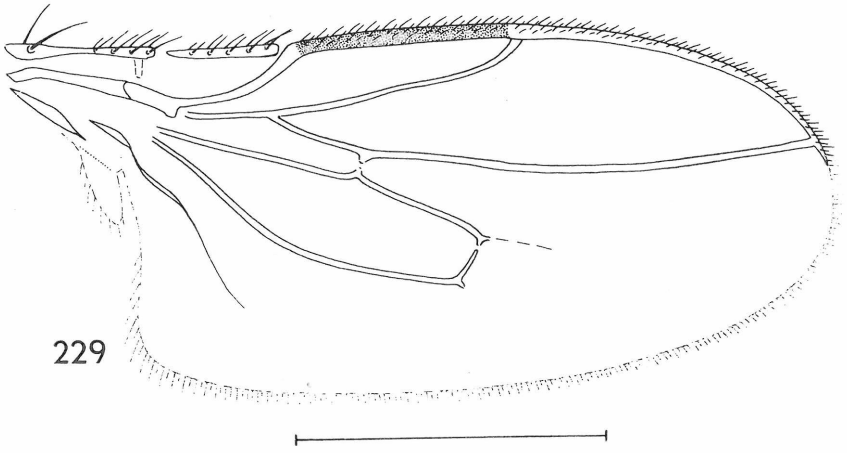


Figs. 220–223. *Minilimosina* (*S.*) *v-atrum* (VILLENEUVE). 220 – female postabdomen dorsally; 221 – dtto laterally; 222 – dtto ventrally (all based on ♀ paralectotype of *L. guestphalica*); 223 – spermathecae (based on specimens from Finland). A – fused paired spermathecae. Scales: Figs. 220–222 = 0.1 mm. Fig. 223 = 0.05 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195

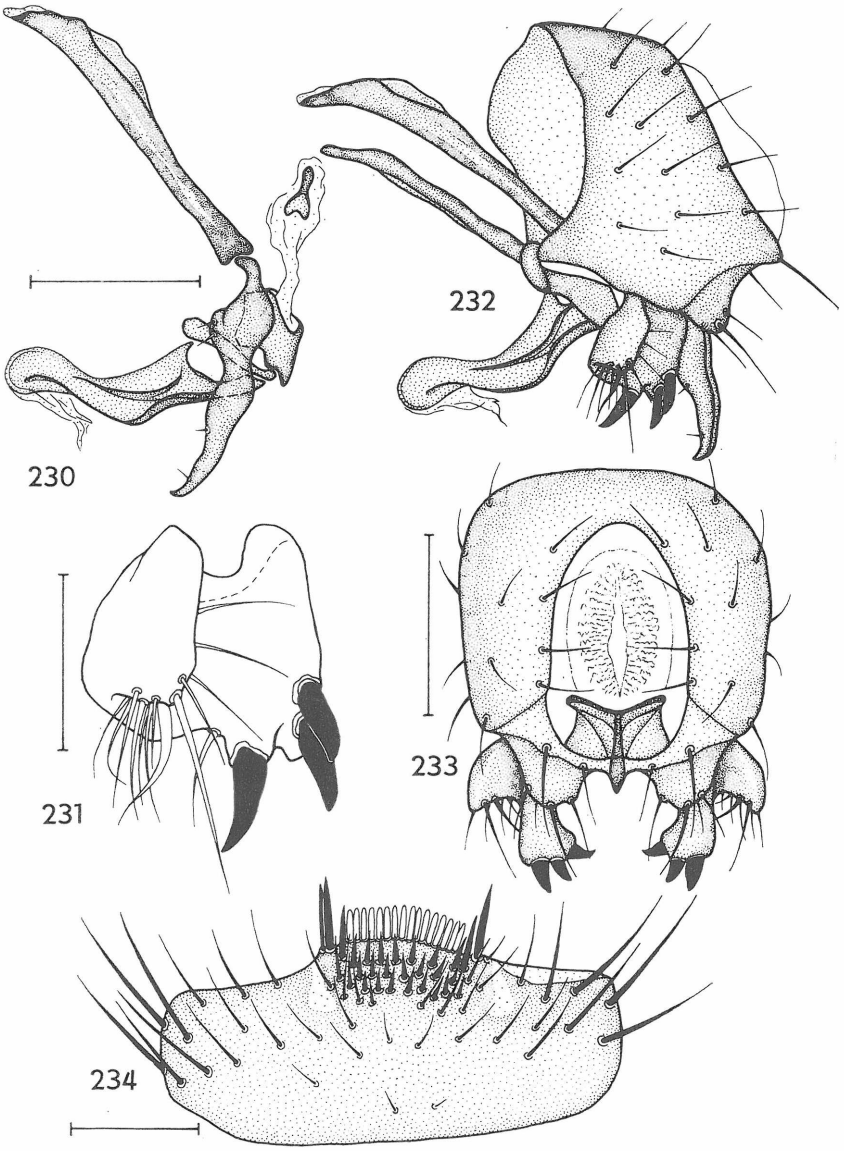




Figs. 224–228. Fig. 224. *Minilimosina* (*S.*) *v-atrum* (VILLENEUVE) (♂, Czechoslovakia), mesopleuron and sternopleuron (pruinose area dotted); Figs. 225–228. *Minilimosina* (*S.*) *ismayi* spec. nov. (♂, holotype). 225 – male t_2 dorsally; 226 – dtto anteriorly; 227 – *S6*; 228 – mesopleuron and sternopleuron (pruinose area dotted). Scales: Figs. 224, 227, 228 = 0.1 mm, Figs. 225, 226 = 0.2 mm.

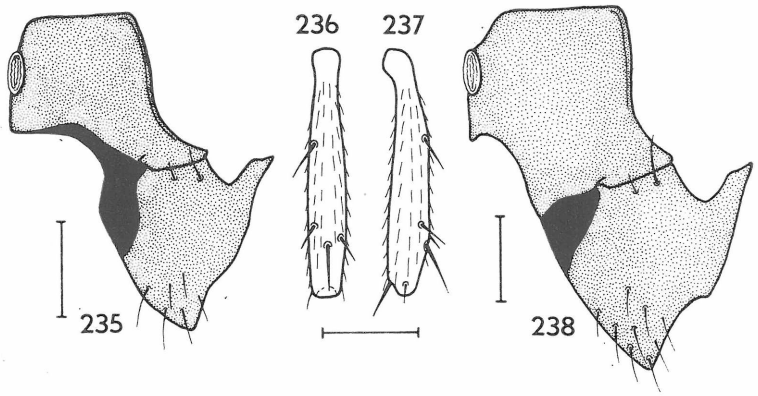
Fig. 229. *Minilimosina* (*S.*) *ismayi* spec. nov. (♂, holotype), wing. Scale = 0.5 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195



Figs. 230–234. *Minilimosina* (*S.*) *ismayi* spec. nov. (♂, holotype). 230 – aedeagal complex laterally (only left postgonite figured); 231 – telomere; 232 – genitalia laterally; 233 – dtto caudally (aedeagal complex omitted); 234 – *S5*. Scales: Figs. 230, 232–234 = 0.1 mm, Fig. 231 = 0.05 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195



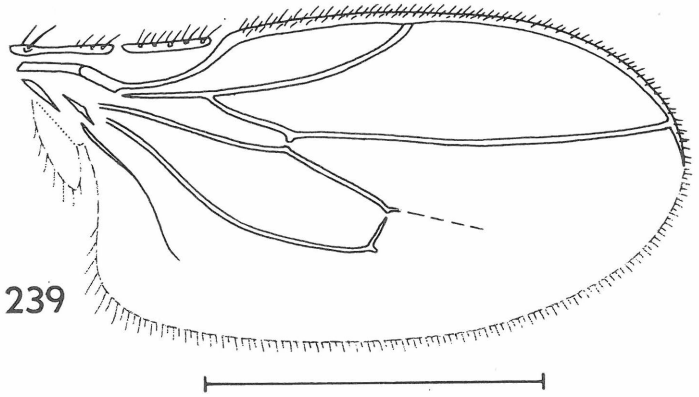


Fig. 235–238. Figs. 235–237. *Minilimosina* (*M.*) *tenera* spec. nov. (♂, holotype). 235 – mesopleuron and sternopleuron (pruinose area dotted); 236 – t_2 dorsally; 237 – dtto anteriorly. Fig. 238. *Minilimosina* (*M.*) *fungicola* (HALIDAY) (♂, Czechoslovakia), mesopleuron and sternopleuron (pruinose area dotted). Scales = 0.1 mm.

Fig. 239. *Minilimosina* (*M.*) *tenera* spec. nov. (♂, holotype), wing. Scale = 0.5 mm.

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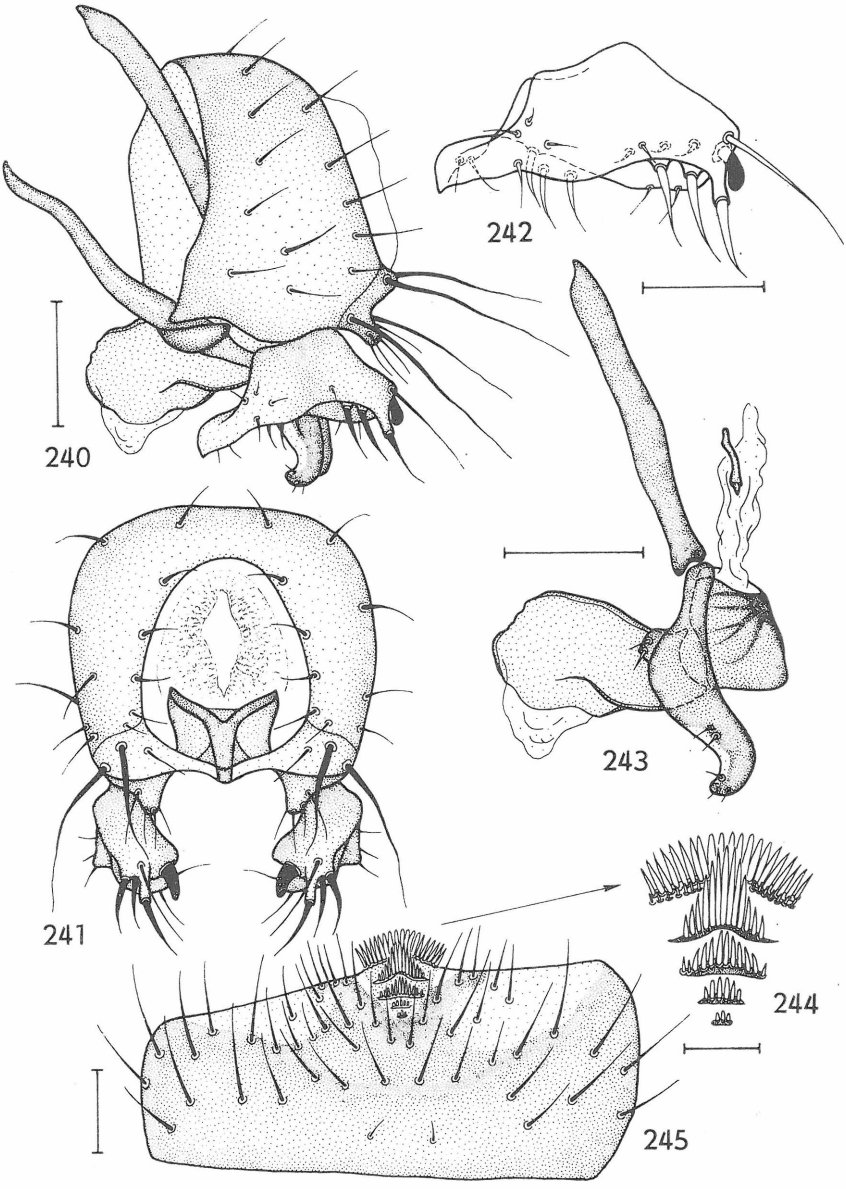
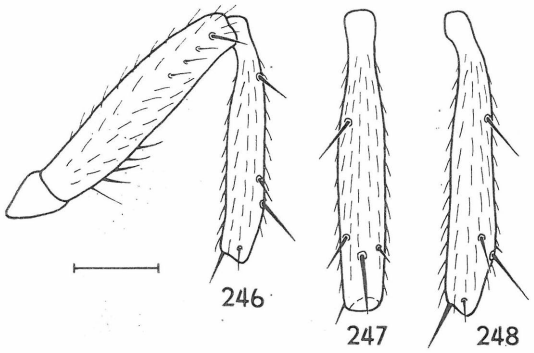
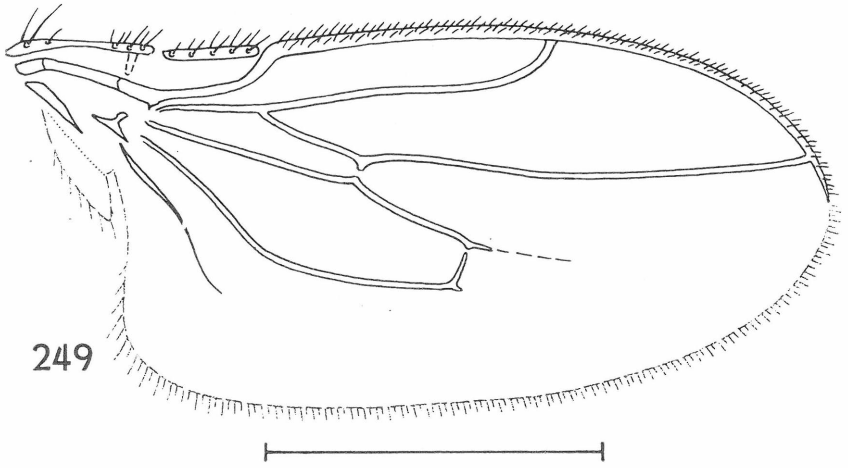


Figs. 240–245. *Minilimosina* (*M.*) *tenera* spec. nov. (♂, holotype). 240 – genitalia laterally; 241 – ditto caudally (aedeagal complex omitted); 242 – telomere; 243 – aedeagal complex laterally (only left postgonite figured); 244 – posteromedial combs of spines on *S5*; 245 – *S5*. Scales: Figs. 240, 241, 243, 245 = 0.05 mm, Fig. 242 = 0.03 mm, Fig. 244 = 0.02 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195





Figs. 246–248. *Minilimosina* (*M.*) *fungicola* (HALIDAY) (Czechoslovakia). 246 – male mid trochanter, f_2 and t_2 anteriorly; 247 – female t_2 dorsally; 248 – dtto anteriorly. Scale = 0.1 mm.

Fig. 249. *Minilimosina* (*M.*) *fungicola* (HALIDAY) (♂, Czechoslovakia), wing. Scale = 0.5 mm.

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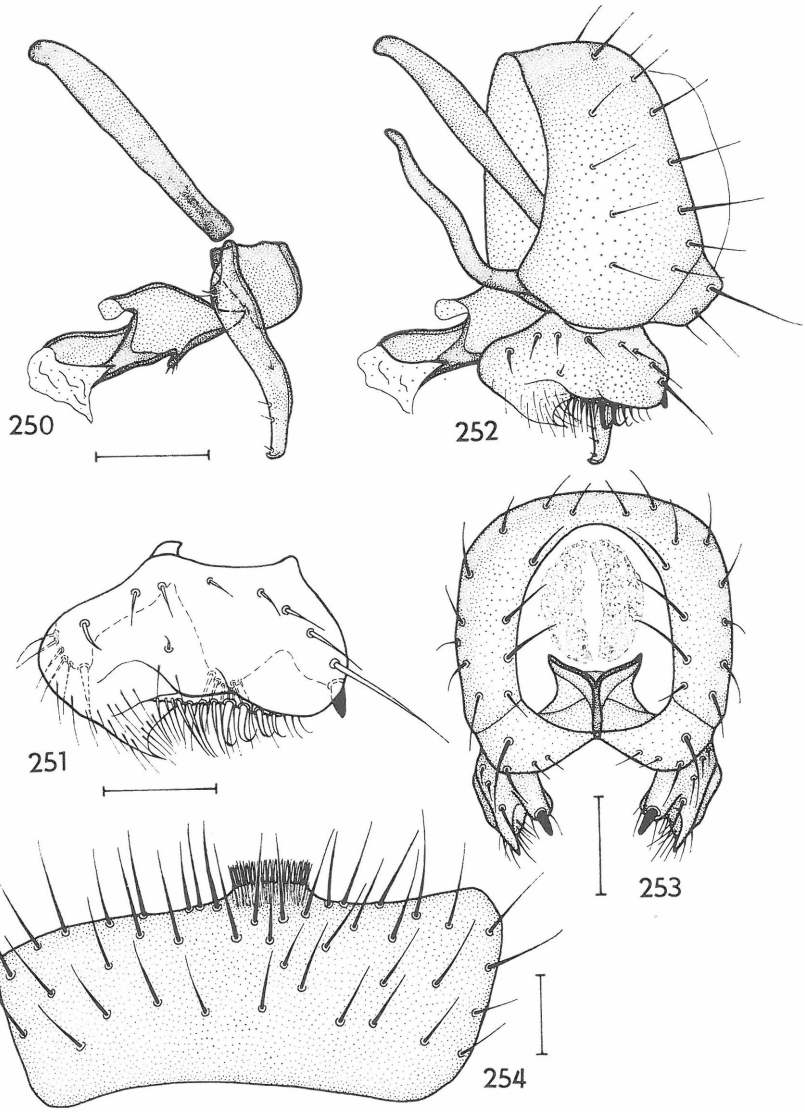

Figs. 250–254. *Minilimosina* (*M.*) *fungicola* (HALIDAY) (♂, paralectotype of *L. exigua*). 250 – aedeaga complex laterally (only left postgonite figured); 251 – telomere; 252 – genitalia laterally; 253 – dtto caudally (aedeagal complex omitted); 254 – *S5*. Scales: Figs. 250, 252–254 = 0.05 mm, Fig. 251 = 0.03 mm

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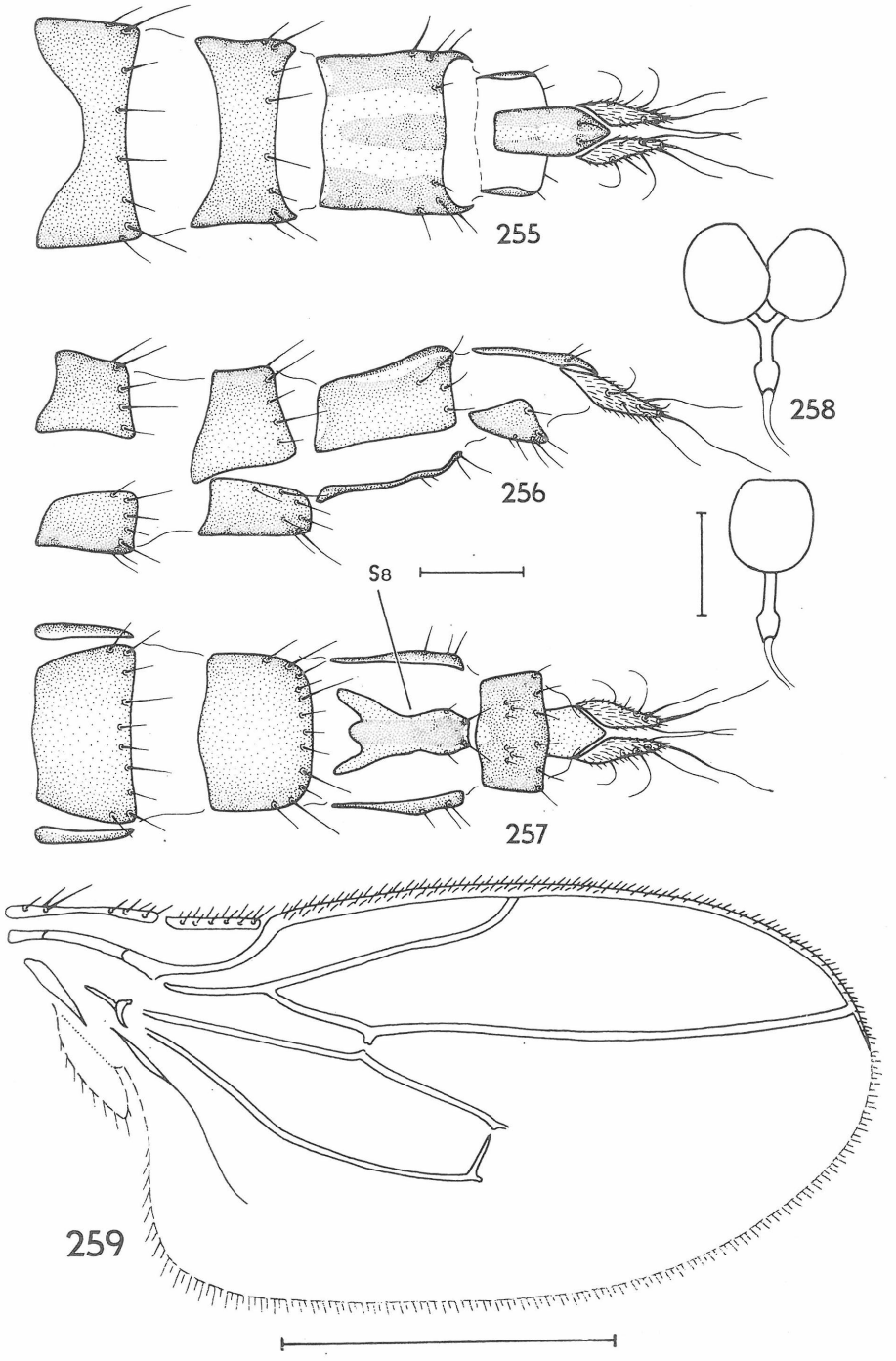

Figs. 255–258. *Minilimosina* (*M.*) *fungicola* (HALIDAY) (♀, Czechoslovakia). 255 – postabdomen dorsally; 256 – dtto laterally; 257 – dtto ventrally; 258 – spermathecae. Scales: Figs. 255–257 = 0.1 mm, Fig. 258 = 0.05 mm. Abbreviations: see p. 198 (part I).

Fig. 259. *Minilimosina* (*M.*) *gemella* spec. nov. (♂, paratype), wing. Scale = 0.5 mm.

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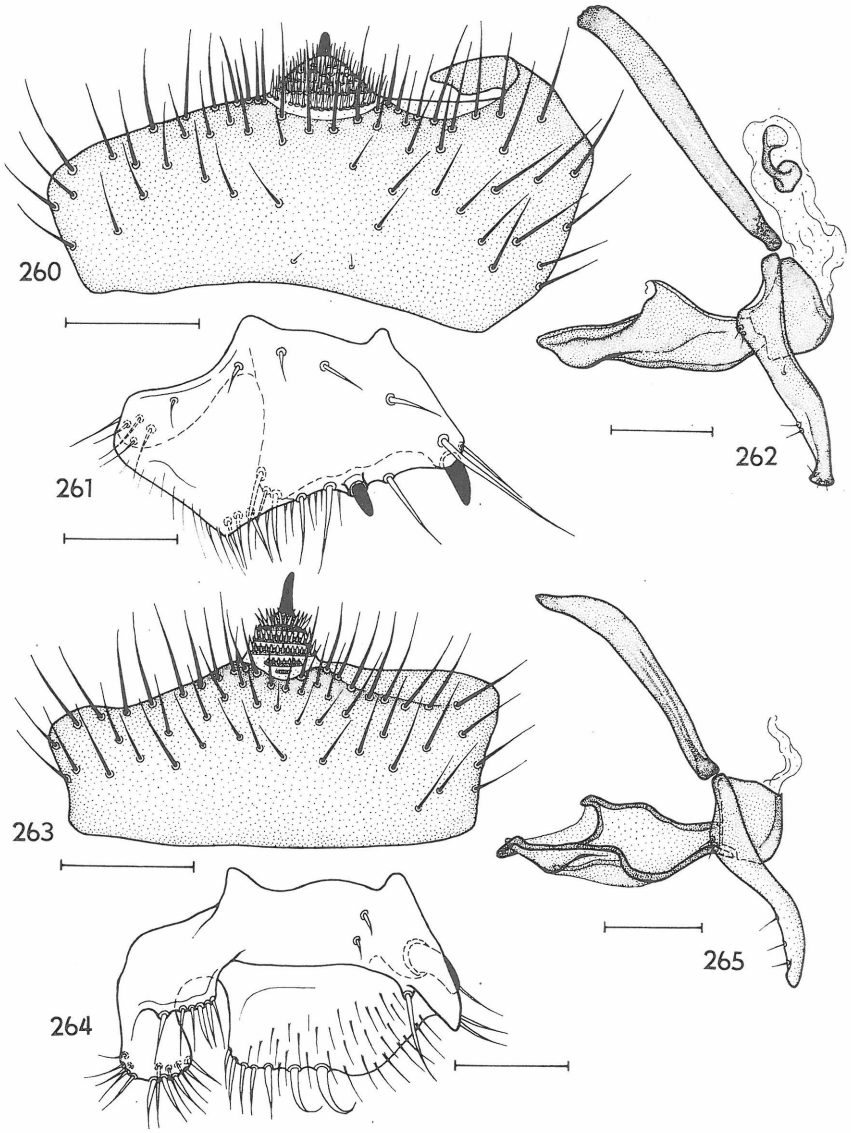

Figs. 260–265. Figs. 260–262. *Minilimosina* (*M.*) *gemella* spec. nov. (♂, paratype). 260 – *S5*; 261 – telomere; 262 – aedeagal complex laterally (only left postgonite figured). Figs. 263–265. *Minilimosina* (*M.*) *trogeri* spec. nov. (♂, paratype). 263 – *S5*; 264 – telomere; 265 – aedeagal complex (only left postgonite figured). Scales: Figs. 260, 263 = 0.1 mm, Figs. 261, 264 = 0.03 mm, Figs. 262, 265 = 0.05 mm.

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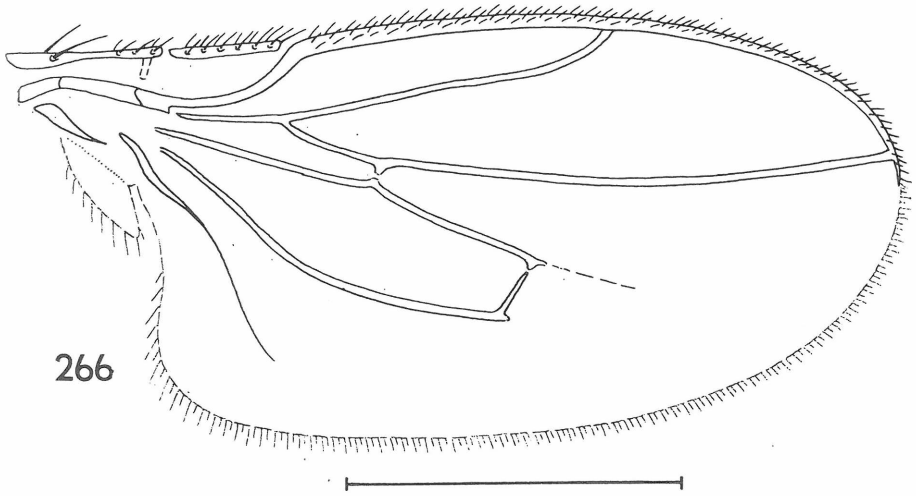
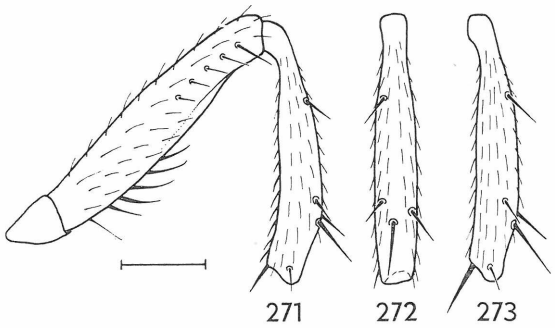




Figs. 267—270 see page 180

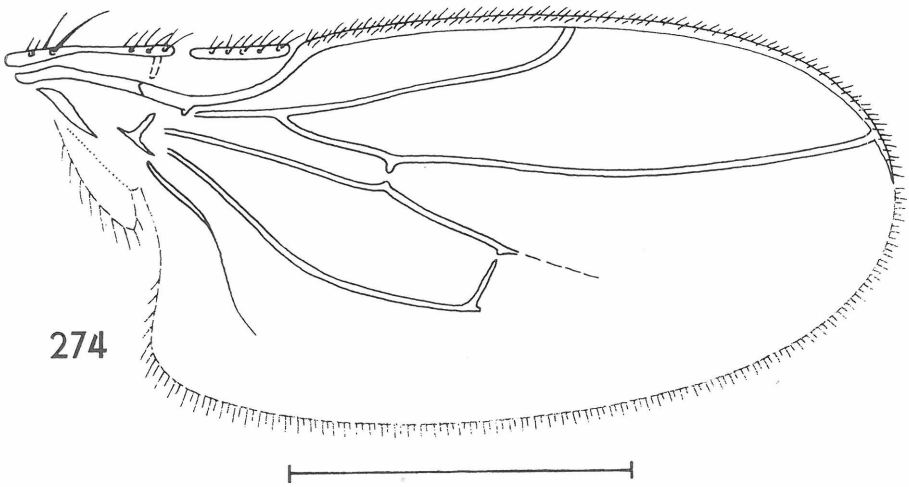
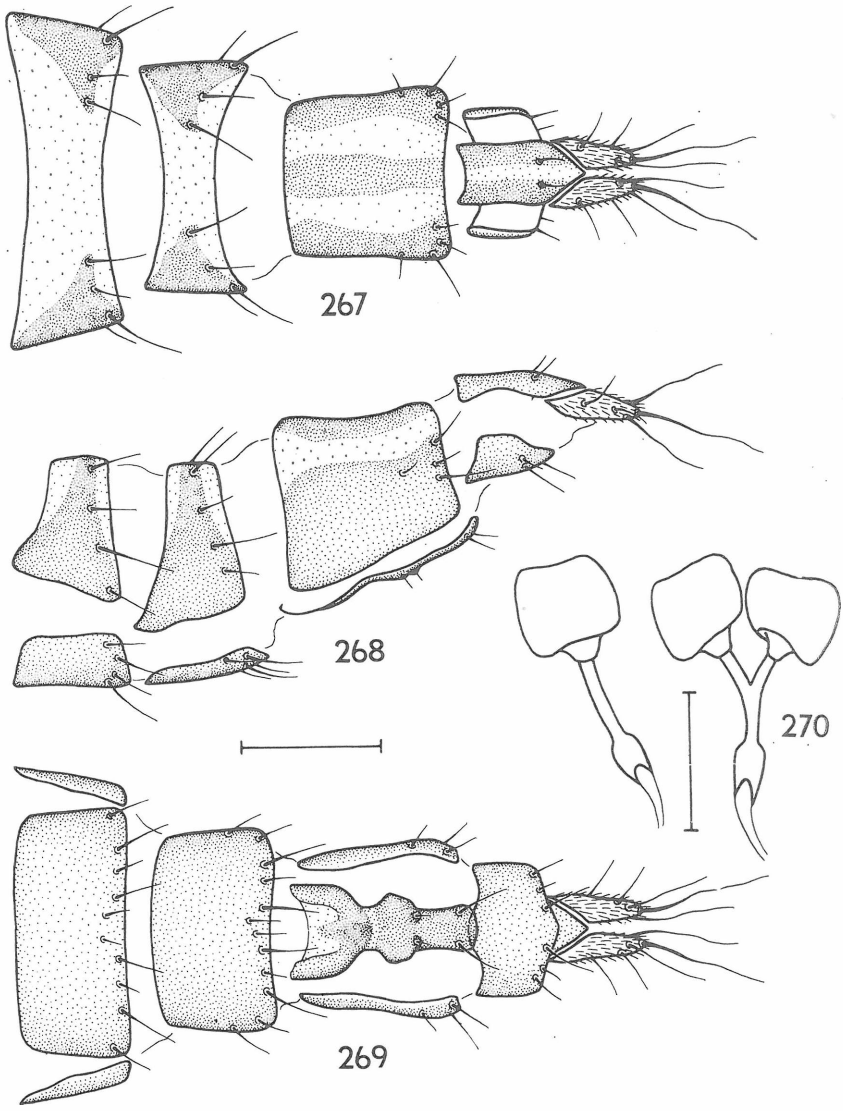


Fig. 266. *Minilimosina* (*M.*) *trogeri* spec. nov. (♂, paratype), wing. Scale = 0.5 mm.

Figs. 271—273. *Minilimosina* (*M.*) *parvula* (STENHAMMAR) (Czechoslovakia). 271 — male mid trochanter, f_2 and t_2 anteriorly; 272 — female t_2 dorsally; 273 — dtto anteriorly. Scale = 0.1 mm.

Fig. 274. *Minilimosina* (*M.*) *parvula* (STENHAMMAR) (♂, Czechoslovakia), wing. Scale = 0.5 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195



Figs. 267–270. *Minilimosina* (*M.*) *trogeri* spec. nov. (♀, allotype). 267 – postabdomen dorsally; 268 – dtto laterally; 269 – dtto ventrally; 270 – spermathecae. Scales: Figs. 267–269 = 0.1 mm, Fig. 270 = 0.05 mm.

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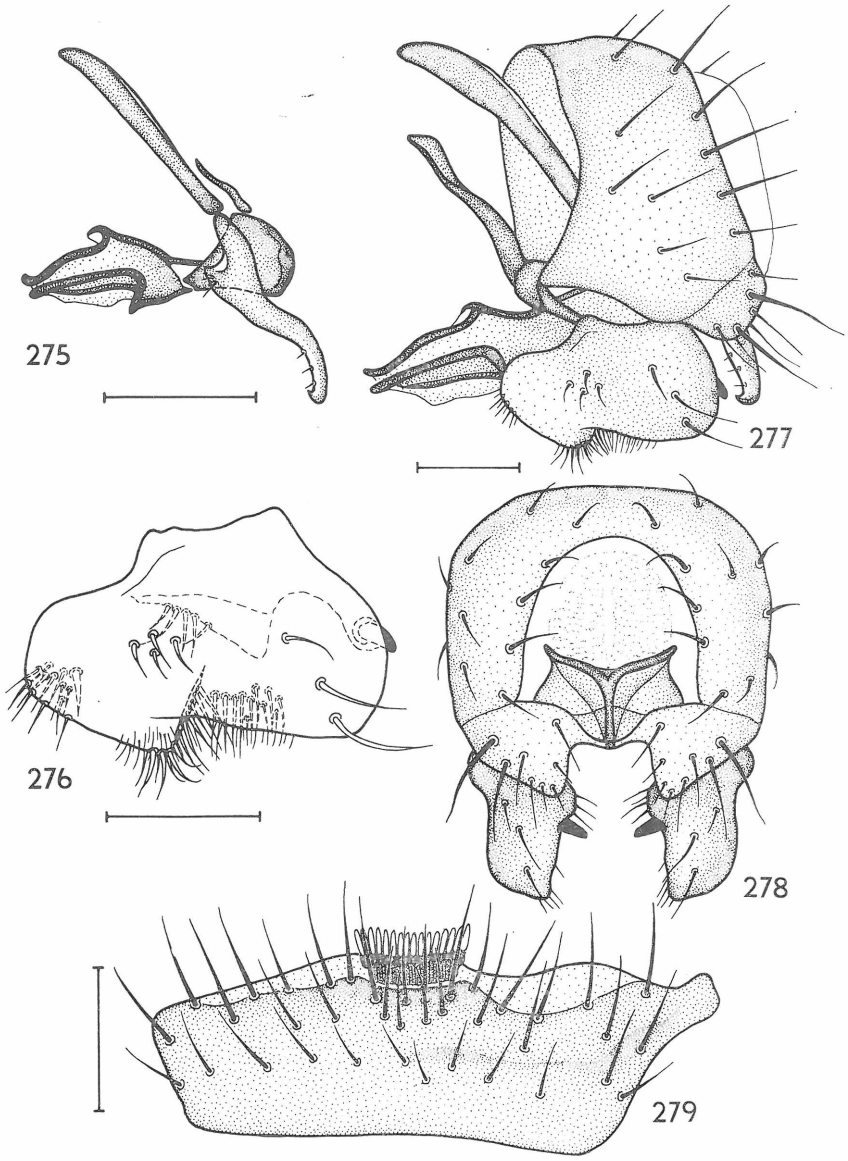

Figs. 275–279. *Minilimosina* (*M.*) *parvula* (STENHAMMAR) (♂, Czechoslovakia). 275 – aedeagal complex laterally (only left postgonite figured); 276 – telomere; 277 – genitalia laterally; 278 – ditto caudally (aedeagal complex omitted); 279 – *S5*. Scales: Figs. 275, 279 = 0.1 mm, Figs. 276–278 = 0.05 mm.

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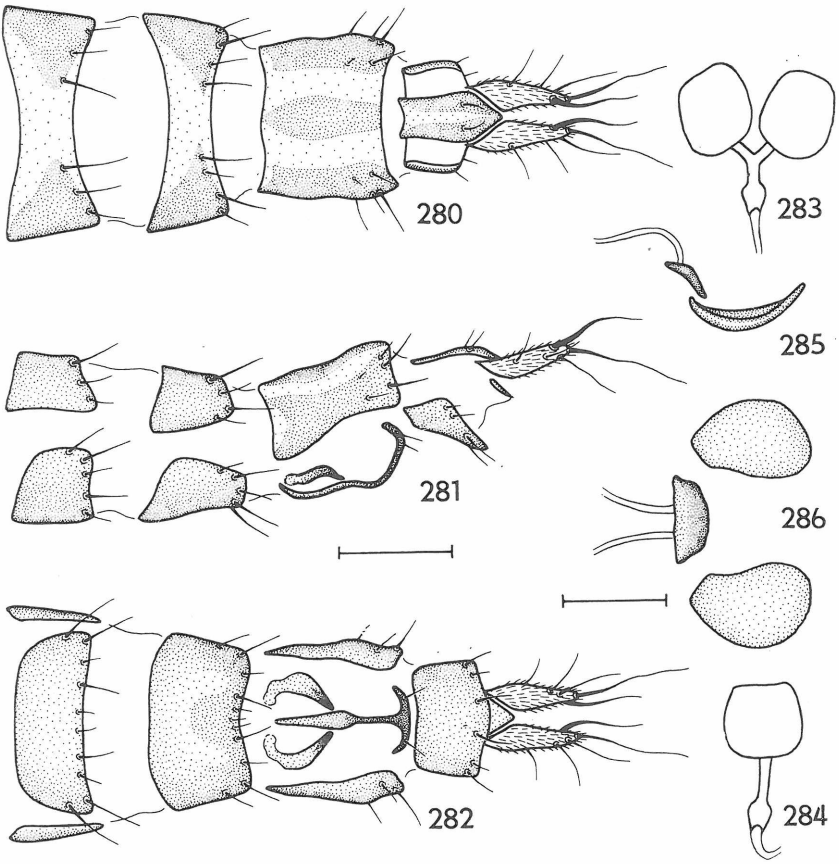

Figs. 280–286. *Minilimosina* (*M.*) *parvula* (STENHAMMAR) (♀, Czechoslovakia). 280 – postabdomen dorsally 281 – dtto laterally; 282 – dtto ventrally; 283, 284 – spermathecae; 285 – internal sclerite laterally; 286 – dtto ventrally. Scales: Figs. 280–282 = 0.1 mm, Figs. 283–286 = 0.05 mm.

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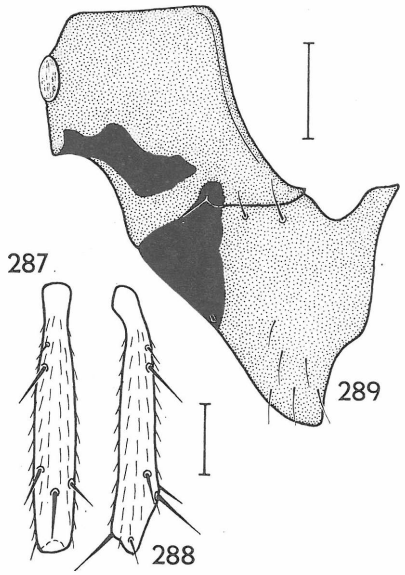

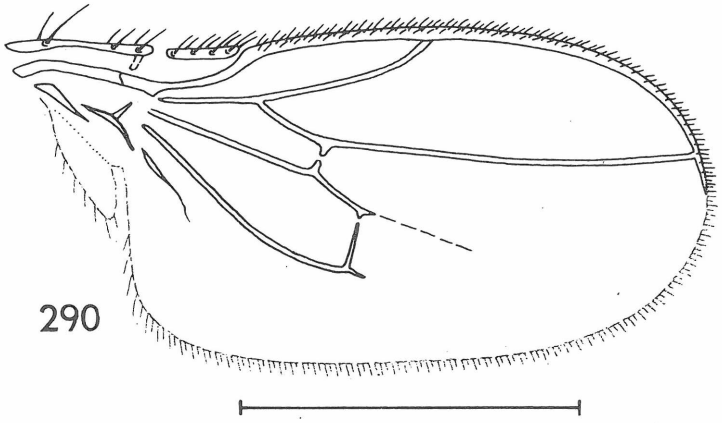

Figs. 287–289. *Minilimosina* (*A.*) *albinervis* (DUDA) (♀, Spain). 287 – t_2 dorsally; 288 – ditto anteriorly; 289 – mesopleuron and sternopleuron (pruinose area dotted). Scales = 0.1 mm.

Fig. 290. *Minilimosina* (*A.*) *albinervis* (DUDA) (♀, Spain), wing. Scale = 0.5 mm.

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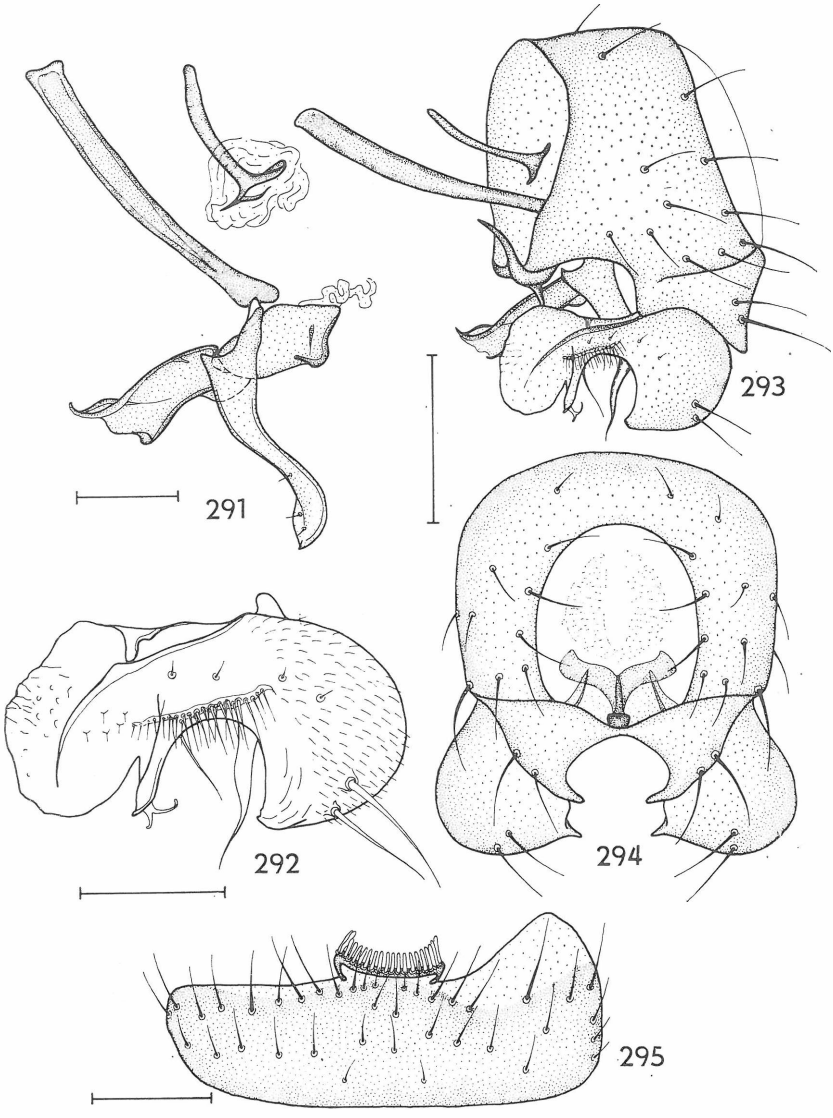

Figs. 291–295. *Minilimosina* (*A.*) *albinervis* (DUDA) (♂, paralectotype). 291 – aedeagal complex laterally (only left postgonite figured); 292 – telomere; 293 – genitalia laterally; 294 – dtto caudally (aedeagal complex omitted); 295 – *S5*. Scales: Figs. 291, 292 = 0.05 mm, Figs. 293–295 = 0.1 mm.

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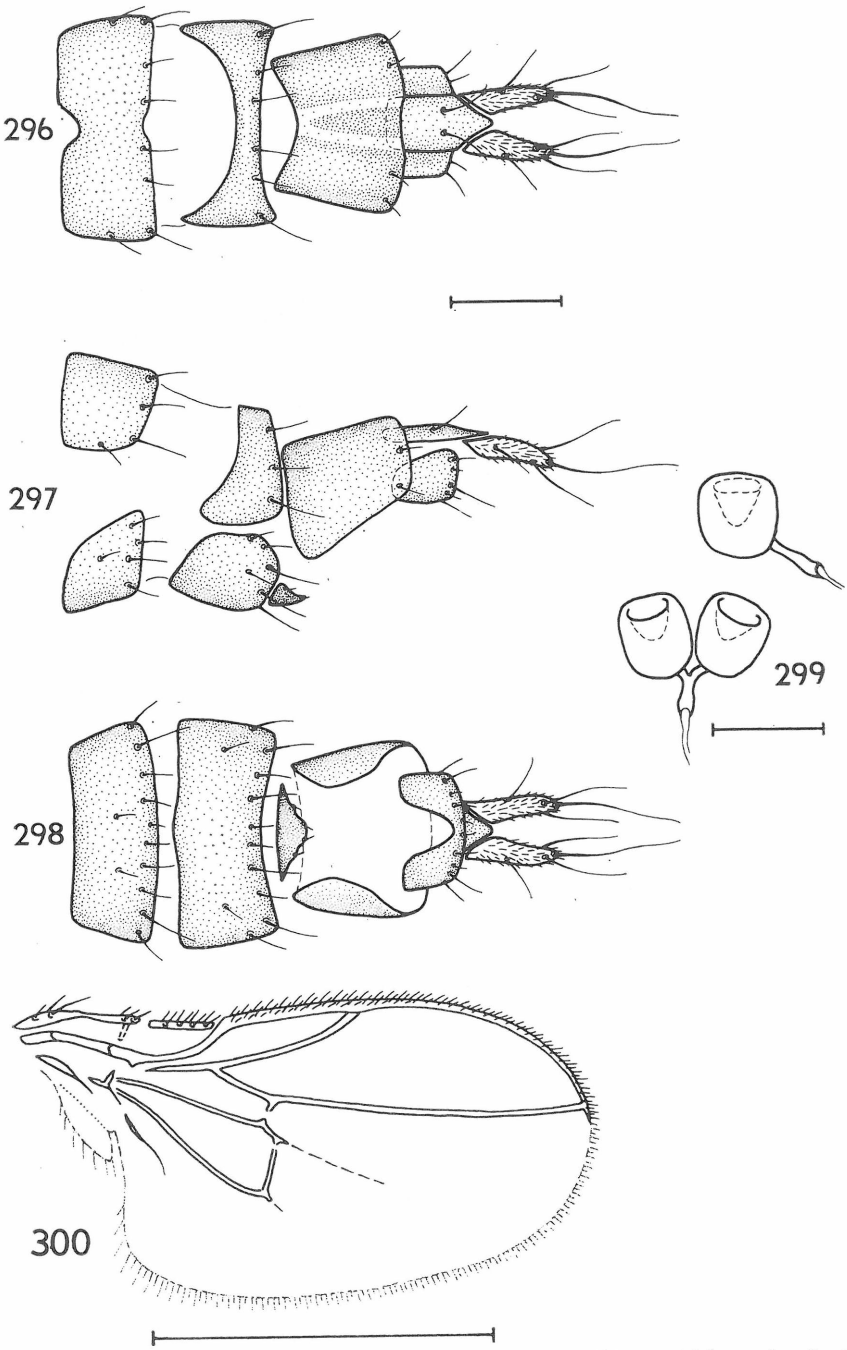
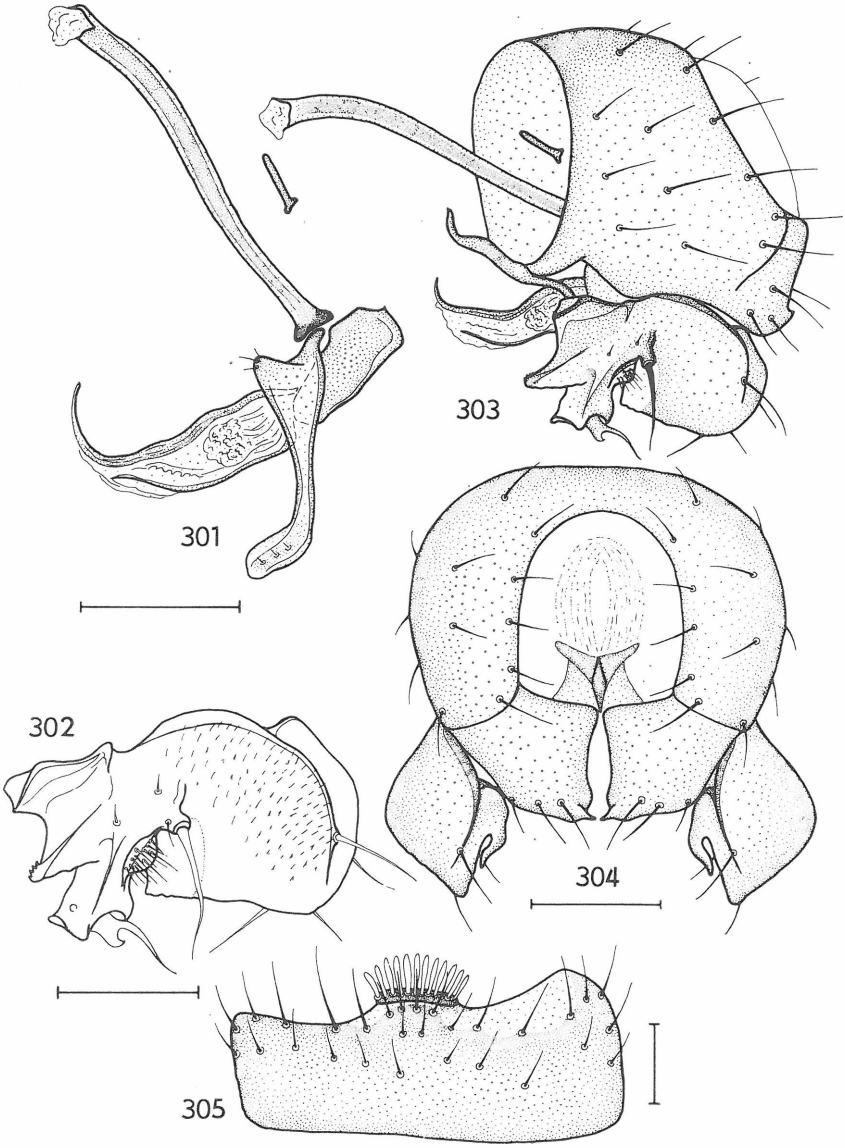


Figs. 296–299. *Minilimosina* (*A.*) *albinervis* (DUDA) (♀, paralectotype). 296 – postabdomen dorsally; 297 – dtto laterally; 298 – dtto ventrally; 299 – spermathecae. Scales: Figs. 296–298 = 0.1 mm, Fig. 299 = 0.05 mm.

Fig. 300. *Minilimosina* (*A.*) *alloneura* (RICHARDS) (♂, Czechoslovakia), wing. Scale = 0.5 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195



Figs. 301–305. *Minilimosina* (*A.*) *alloneura* (RICHARDS) (♂, paratype). 301 – aedeagal complex laterally (only left postgonite figured); 302 – telomere; 303 – genitalia laterally; 304 – dtto caudally (aedeagal complex omitted); 305 – *S5*. Scales = 0.05 mm.

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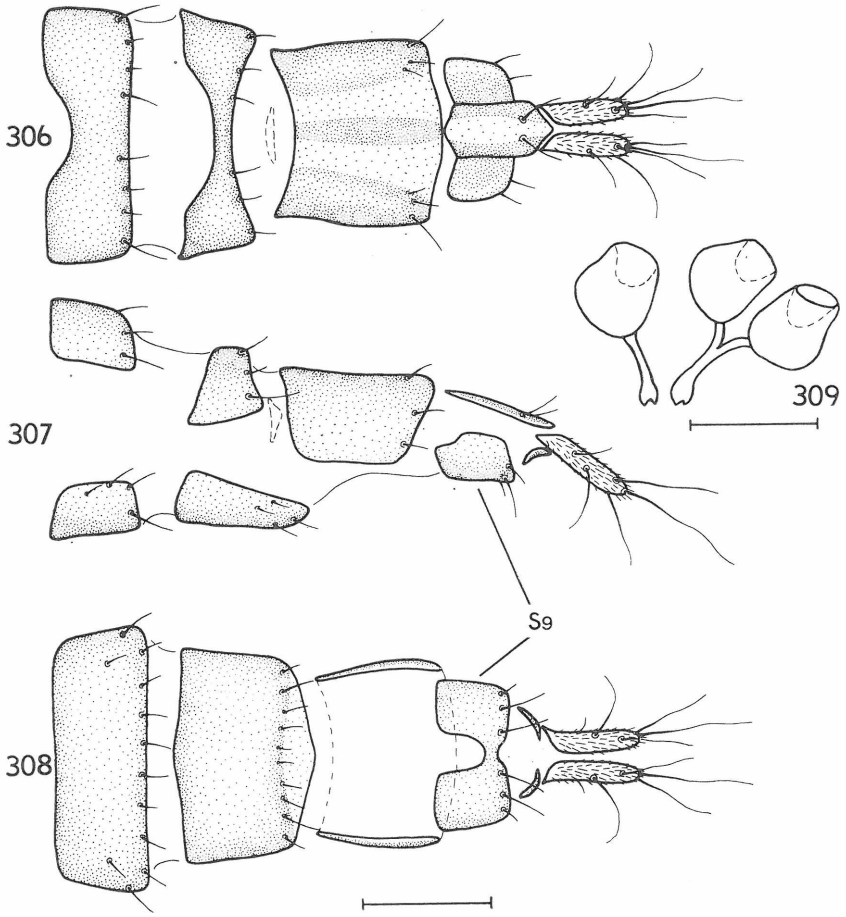

Figs. 306–309. *Minilimosina* (*A.*) *alloneura* (RICHARDS) (♀, Czechoslovakia). 306 – postabdomen dorsally; 307 – dtto laterally; 308 – dtto ventrally; 309 – spermathecae. Scales: Figs. 306–308 = 0.1 mm, Fig. 309 = 0.05 mm. Abbreviations: see p. 198 (part I).

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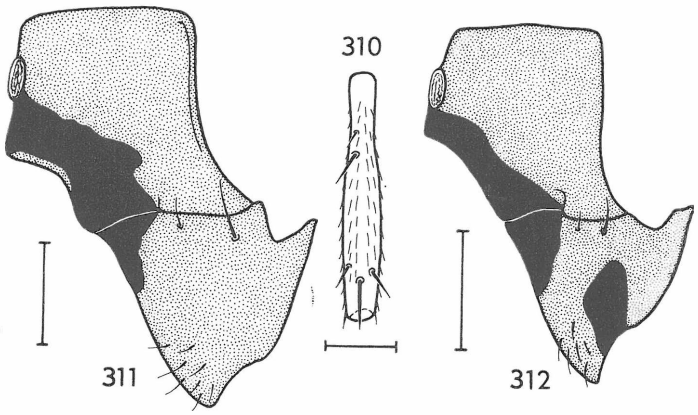
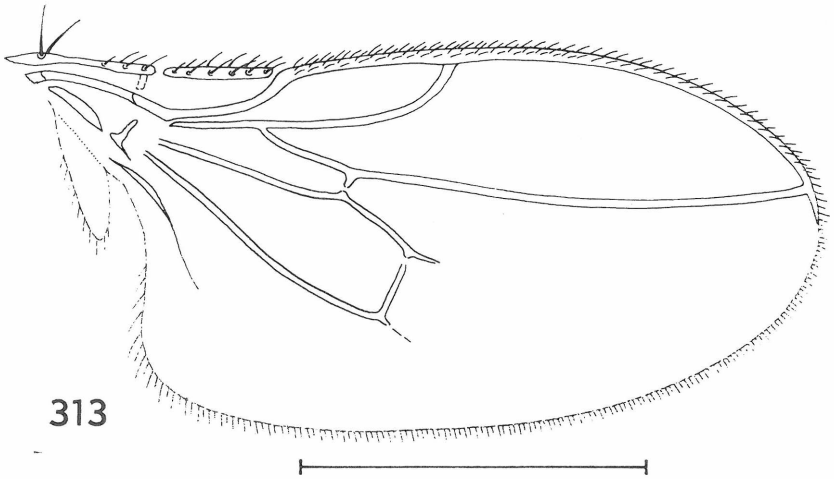
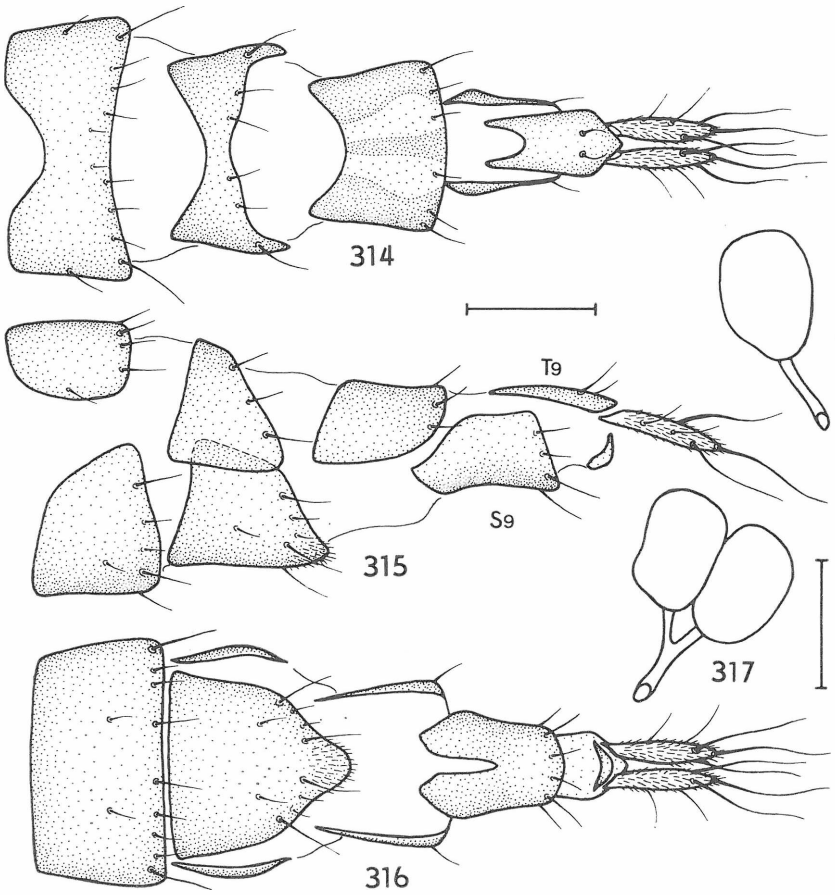




Figs. 310–312. Figs. 310–311. *Minilimosina* (*A.*) *secundaria* (DUDA) (♀, holotype). 310 – t_3 dorsally; 311 – mesopleuron and sternopleuron (pruinose area dotted); Fig. 312. *Minilimosina* (*A.*) *alloneura* (RICHARDS) (♂, paratype), mesopleuron and sternopleuron (pruinose area dotted). Scales = 0.1 mm.

Fig. 313. *Minilimosina* (*A.*) *secundaria* (DUDA) (♀, England), wing. Scale = 0.5 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195



Figs. 314–317. *Minilimosina* (*A.*) *secundaria* (DUDA) (♀, holotype). 314 – postabdomen dorsally; 315 – dtto laterally; 316 – dtto ventrally; 317 – spermathecae. Scales: Fig. 314–316 = 0.1 mm, Fig. 317 = 0,05 mm. Abbreviations: see p. 198 (part I).

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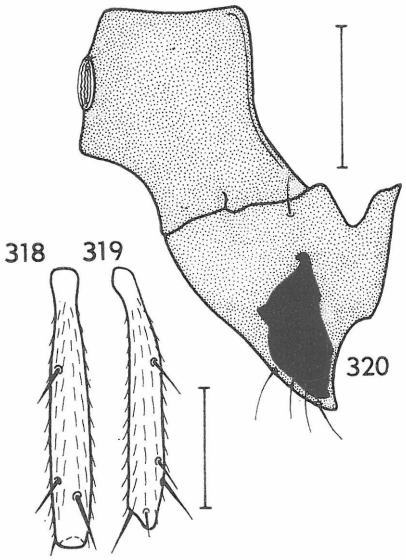
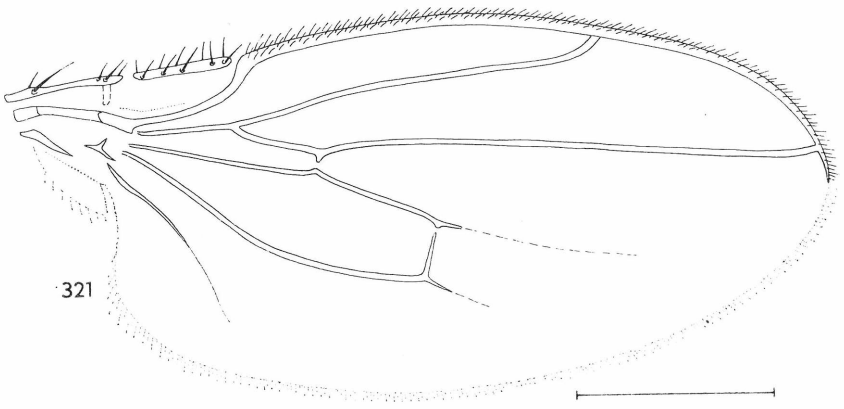
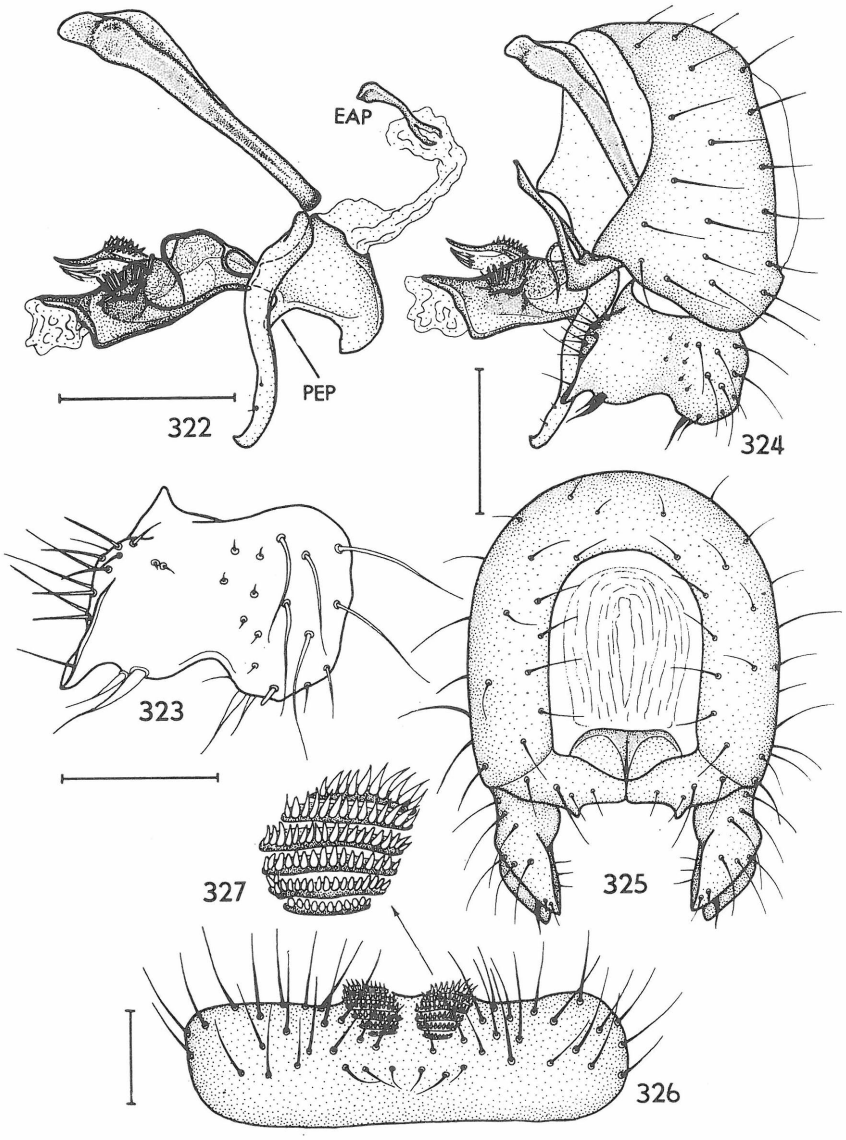




Figs. 318–320. *Xenolimosina setaria* (VILLENEUVE). 318 – female t_2 dorsally; 319 – male t_2 anteriorly (based on specimens from England); 320 – mesopleuron and sternopleuron (based on ♀ from GDR; pruinose area dotted). Scales = 0.2 mm.

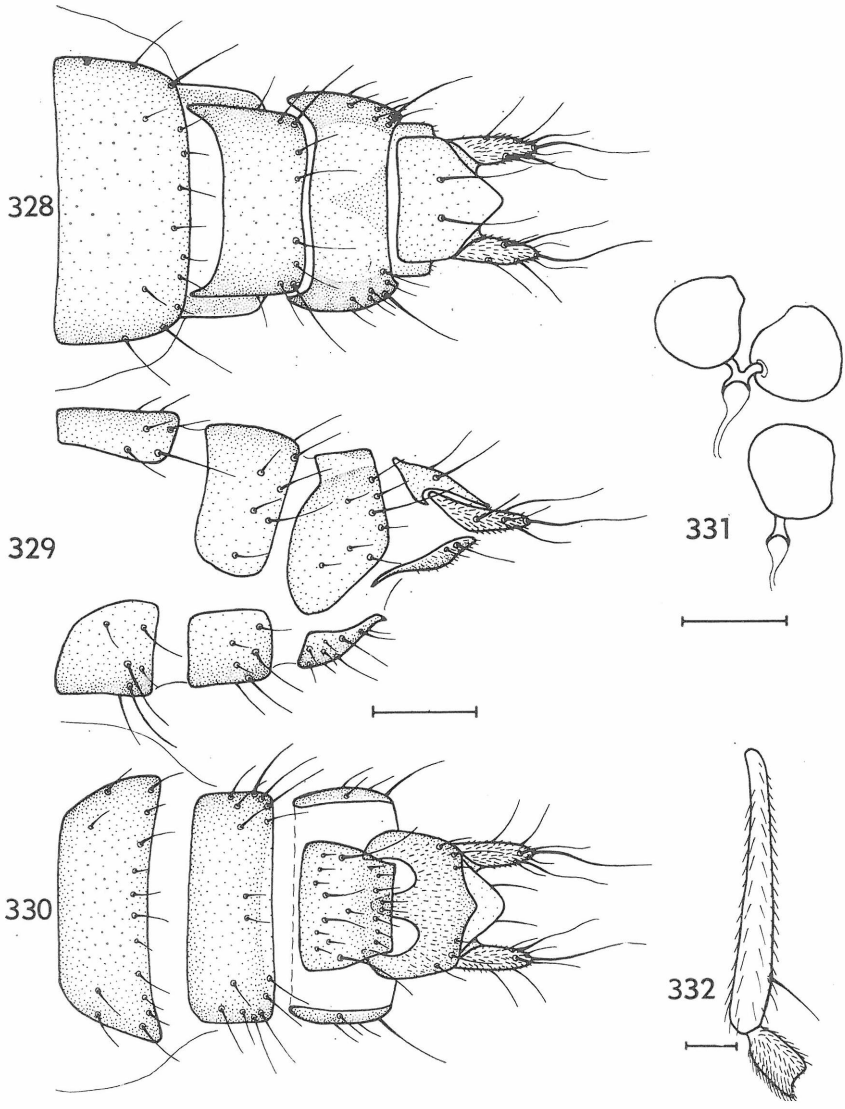
Fig. 321. *Xenolimosina setaria* (VILLENEUVE) (♀, GDR), wing. Scale = 0.5 mm.

DOI: 10.21248/contrib.entomol.33.1.3-195



Figs. 322–327. *Xenolimosina setaria* (VILLENEUVE) (♂, England). 322 – aedeagal complex laterally (only left postgonite figured); 323 – telomere; 324 – genitalia laterally; 325 – dtto caudally (aedeagal complex omitted); 326 – *S5*; 327 – a detail of the posteromedial comb-like structure. Scales: Figs. 322, 324–326 = 0.1 mm, Fig. 323 = 0.05 mm. Abbreviations: see p. 198 (part I).

DOI: 10.21248/contrib.entomol.33.1.3-195



Figs. 328–332. *Xenolimosina setaria* (VILLENEUVE) (♀, England) 328 – postabdomen dorsally; 329 – dtto laterally; 330 – dtto ventrally; 331 – spermathecae; 332 – t_3 and mt_3 anteriorly. Scales: Figs. 328–330. 332 = 0.1 mm, Fig. 331 = 0.05 mm.

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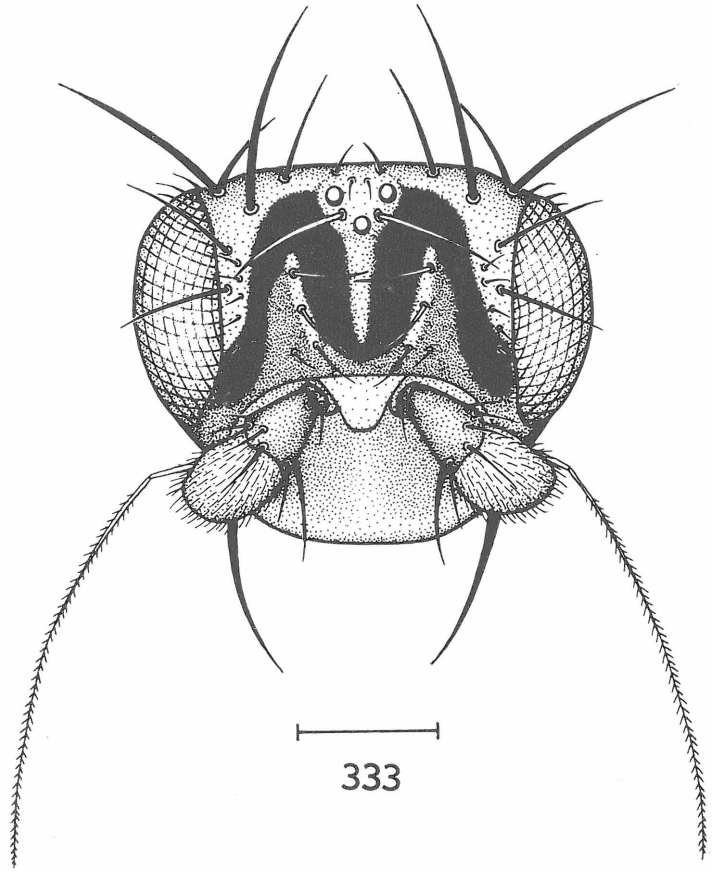

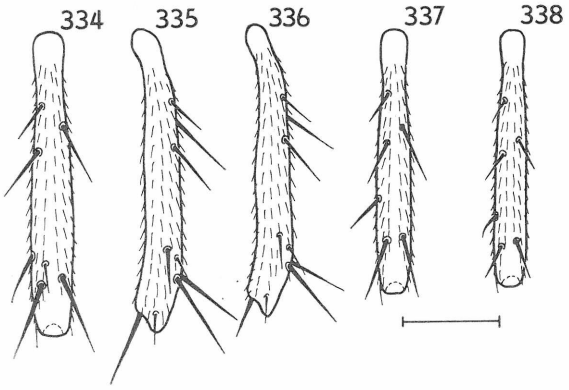

Fig. 333. *Paralimosina* (*P.*) *fucata* (RONDANI) (♀, Czechoslovakia), head frontodorsally. Scale = 0.2 mm.

Figs. 334–338. *Paralimosina* species. Figs. 334–336. *P.* (*P.*) *fucata* (RONDANI) Czechoslovakia). 334 – female t_2 dorsally; 335 – dtto anteriorly; 336 – male t_2 anteriorly; Fig. 337. *P.* (*P.*) *macedonica* (ROHÁČEK) (♂, holotype), t_2 dorsally; Fig. 338. *P.* (*P.*) *subcribrata* (ROHÁČEK) (♂, holotype), t_2 dorsally. Scale = 0.2 mm.

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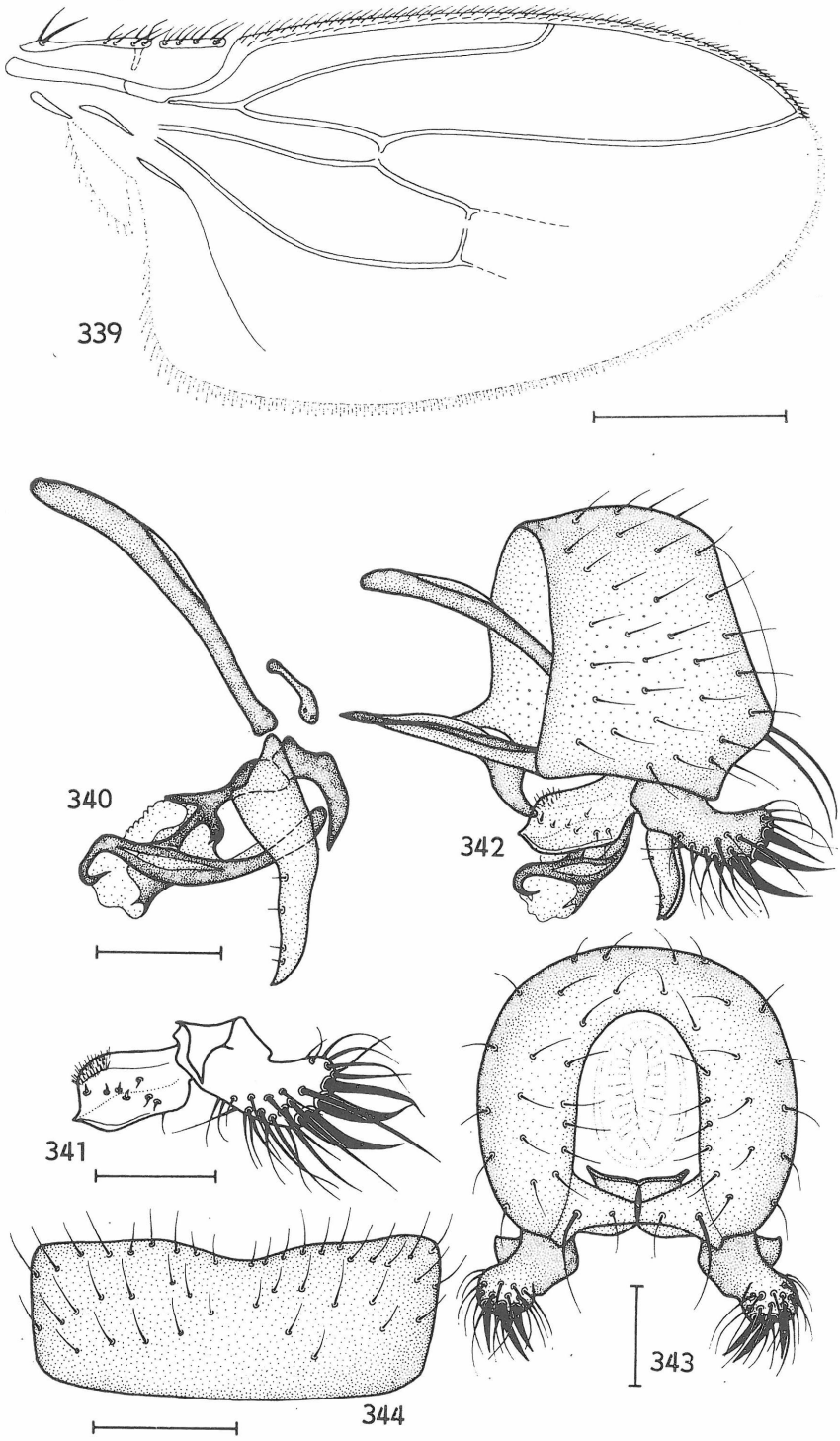

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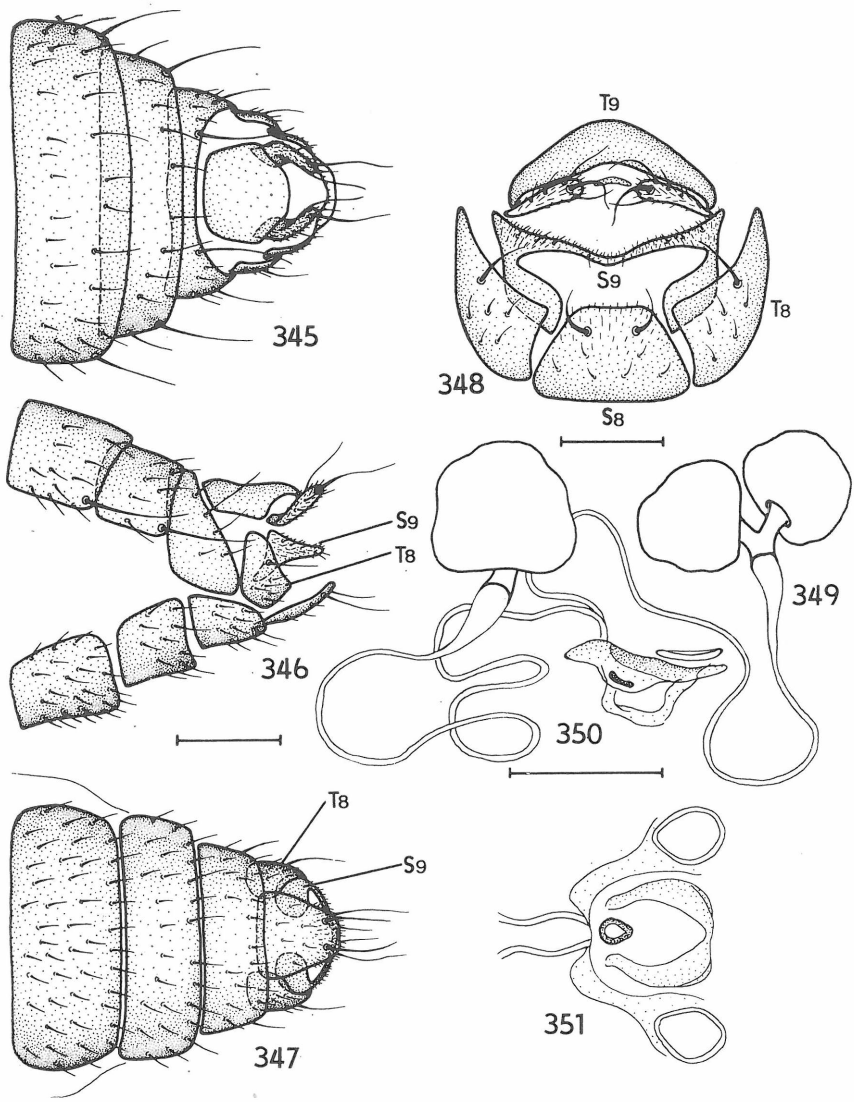

◀ Fig. 339. *Paralimosina* (*P.*) *fucata* (RONDANI) (♂, Czechoslovakia), wing. Scale = 0.5 mm.

◀ Figs. 340–344. *Paralimosina* (*P.*) *fucata* (RONDANI) (♂, Czechoslovakia). 340 – aedeagal complex laterally (only left postgonite figured); 341 – telomere; 342 – genitalia laterally; 343 – dtto caudally (aedeagal complex omitted); 344 – *S5*. Scales: Figs. 340–343 = 0.1 mm, Fig. 344 = 0.2 mm.

Figs. 345–351. *Paralimosina* (*P.*) *fucata* (RONDANI) (♀, Czechoslovakia). 345 – postabdomen dorsally; 346 – dtto laterally; 347 – dtto ventrally; 348 – apex of postabdomen caudally; 349 – spermathecae; 350 – spectacles-shaped sclerite laterally; 351 – dtto ventrally. Scales: Figs. 345–347 = 0.2 mm, Figs. 348–351 = 0.1 mm. Abbreviations: see p. 198 (part I).

Part III in the following issue

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