A review of the genus Paralimosina L. Papp (Diptera, Sphaeroceridae), with descriptions of ten new species

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Abstract — A review, covering the 20 Palaearctic and Oriental species of Paralimosina L. PAPP, 1973 is given. Data on primary types, published descriptions and figures, synonyms and distribution including new records, are provided. The genus is redefined without the subgenus Canarisina Roháček, 1983 which is removed and synonymized (syn. n.) with Aptilotus Mik, 1898. The monotypic apterous taxa Hackmaniella L. PAPP, 1979 and Nipponsina L. PAPP, 1982 are placed as new synonyms of Paralimosina, and their type species, viz. P. ceylanica (L. PAPP, 1979) comb. n. and P. sexsetosa (L. PAPP, 1982) comb. n. are redescribed. Ten new species are described and illustrated: P. acris, P. minor (both USSR: Far East), P. lobata (Pakistan), P. brevis, P. bracteata, P. marshalli (all Nepal), P. dimorpha, P. icaros (both India, Nepal), P. gigantea and P. indica (both India), and a key to all 20 Paralimosina species is presented. Notes on the relationships, plus figures of the male gonostylus, of all species are given. Knowledge of the female terminalia is supplemented by description and figures of the accessory glands. With 132 figures.

INTRODUCTION

The limosinine genus *Paralimosina* L. Papp, 1973 was originally described as a monotypic genus for *P. kaszabi* L. Papp, 1973 from Mongolia. On revising its type species, Roháček (1983) recognized that the *Limosina fucata*-group (of Roháček 1977) belongs to this genus and broadened its concept to include a new subgenus, *Canarisina* Roháček, 1983, erected for *Limosina beckeri* Duda, 1918 and allied species. In the meantime L. Papp & Roháček (1981) and Roháček & L. Papp (1983) described 5 new species from Canary Is. and placed them tentatively in *Paralimosina* as forming a separate *P. beckeri*-group (because *Canarisina* was an unavailable name at that time). Marshall (1983) correctly recognized that the *P. beckeri*-group is closely related to *Aptilotus paradoxus* Mik, 1898 and transferred it to *Aptilotus* Mik, 1898. However, the removal of *P. avolans* Roháček & L. Papp, 1983 and the subgenus *Canarisina* Roháček, 1983 from *Paralimosina* has not been formalized up to the present. Two additional species of *Paralimosina* have been described from Japan (Hayashi, 1985) and further two species by L. Papp (1979, 1982), one in *Hackmaniella* and one in *Leptocera* (*Nipponsina*), respectively (see below).

The aim of this study is (1) to redefine the genus *Paralimosina* to include many new and additional species and to exclude the subg. *Canarisina*; (2) to review all 20 known species and provide new distributional records obtained during the last decade; (3) to describe new species from hitherto underinvestigated areas of the Palaearctic and Oriental Regions and (4) to provide a new key to the identification of *Paralimosina* species. Other biogeographic provinces of the Old World are purposefully neglected, although *Paralimosina* occurs there (see below), because of the lack of sufficient material.

The morphological terminology of ROHÁČEK (1982, 1983) is followed here, including

his abbreviations used in descriptions, with two exceptions: the ventral clasping appendages of male genitalia are called gonostyli (= telomeres of Roháček, 1983; surstyli auct.) and the last female postabdominal sclerites are called the 10th tergum and sternum (T10, S10) respectively (= T9, S9 of Roháček 1983; supraanal and subanal plates auct.).

The types and other materials examined are deposited in the following museums and collections: BMNH — British Museum (Natural History), London (UK); BRI — Biosystematics Research Institute, Ottawa (Canada); GUE — Department of Environmental Biology, University of Guelph (Canada); HNHM — Hungarian Natural History Museum, Budapest (Hungary); JRO — J. Roháček's Collection, Opava (Czechoslovakia); MHNG — Muséum d'Histoire Naturelle, Genève (Switzerland); MSF — Museo Zoologico de "La Specola", Firenze (Italy); NITI — National Institute of Agricultural Sciences in Tsukuba, Ibarakiken (Japan); NMP — National Museum, Praha (Czechoslovakia); SMO — Silesian Museum Opava (Czechoslovakia); ZIL — Zoological Institute, University of Lund (Sweden); ZMUM — Zoological Museum, University of Moscow (USSR).

Paralimosina L. PAPP, 1973

Paralimosina L. Papp, 1973: 385 — Type species: Paralimosina kaszabi L. PAPP, 1973 (orig. des., mon.)

Hackmaniella L. PAPP, 1979: 368–369. syn. n. — Type species: Hackmaniella ceylanica L. PAPP, 1979 (orig. des., mon.)

Nipponsina L. Papp, 1982: 347-348 (as subg. of Leptocera) syn. n. — Type species: Leptocera (Nipponsina) sexsetosa L. Papp, 1982 (orig. des., mon.)

Paralimosina (s. str.): Roháček, 1983: 51-52 (redescription).

Diagnosis — The genus is defined as follows: (1) pvt small or absent; (2) 1-2 ors; (3) 2-5 ifr of which 1-3 posterior strong; (4) from usually with dark M-shaped mark, absent in some species; (5) 1-2 dc, the anterior always short; (6) 6-12 rows of ac microsetae; (7) 1-2 stpl, the anterior minute or absent; (8) scutellum flat, more or less semicircular, rarely shortened (P. ceylanica); (9) male f_1 and f_3 often thickened; (10) t_2 chaetotaxy characterized by 3 unpaired proximal bristles and an anterior seta in distal group of bristles; ventral side with or without mid ventral seta; (11) wing (if present) with C not extending beyond apex of R4+5; (12) R4+5 in fully winged species sinuate; (13) discal cell short and broad, usually with extensions of M1+2 and M3+4 beyond tp; (14) alula small, narrow; (15) abdomen with large, heavily sclerotized terga; (16) male S5 without additional structures but sometimes posteromedially prolonged; (17) ventral stripe-like part of male S6 sometimes with processes but always with short, membraneous, finely pubescent lobe(s); (18) periandrium ball-shaped, uniformly setose; (19) hypandrium with robust bifurcate ventral appendage or process; (20) male subanal plate (= cerci of Roháček 1982) with one pair of long caudal setae and 2 pairs of closely set ventral setae which are sometimes modified to flat, scale-like bristles; (21) gonostylus short, bilobed, anterior lobe flattened and without long setae, posterior lobe darker, long setose; (22) phallophore very short, kidney- to sickle-shaped in profile; (23) distiphallus complex, with various processes; (24) postgonite usually slender and more or less bent; (25) ejaculatory apodeme well developed; (26) female postabdomen short, suddenly tapered posteriorly; (27) female T7 extended laterally; (28) T8 divided into 2 lateral sclerites; (29) T10 relatively short and usually pale; (30) S8 usually long and tapered posteriorly; (31) S10 large, anteriorly with a deep incision or emargination; (32) spectacles-shaped sclerite well developed; (33) accessory gland (Figs 41, 80, 131) similar in all species, hyaline, elongate spindle-shaped, with ringed surface; (34) spermathecae vesiculate, often with wrinkled surface, with terminal and/or basal invaginations and sclerotized terminal parts of ducts often bulbously dilated; (35) female cerci with sinuate hairs.

Discussion — The genus, in the present concept (incorporating *Hackmaniella* and *Nipponsina*), is clearly a monophyletic unit well-defined by several apomorphic features, the most important of which seems to be (19)—presence of a ventral appendage of hypandrium. Other highly diagnostic, though less unique characters are 10, 16, 17, 20–22, 31 and 32 (see above diagnosis). Most probably *Biroina* RICHARDS, 1973, with a frons

pattern similar to the M-shaped mark of Paralimosina species, forms a sister-group to Paralimosina. However, Biroina species, which also occur in the Oriental Region and not only in the Australian Region as stated by RICHARDS (1973), have a simple hypandrium and different aedeagal morphology and t_2 chaetotaxy. Another taxon related to Paralimosina seems to be Limosina monorbiseta (DEEMING, 1969) from Nepal (L. PAPP, unpublished). More precise data on the postabdominal structures of both the above taxa are needed to evaluate their affinities to Paralimosina.

Both *Hackmaniella* L. PAPP, 1979 and *Nipponsina* L. Papp, 1982 were based on apterous species having some striking modifications reflecting their terricolous life-habits. Analysis of their genitalia confirms that they belong to *Paralimosina* and therefore *Hackmaniella* and *Nipponsina* are synonymized here.

With the 10 new species described below, the genus *Paralimosina* now comprises 20 species in the Palaearctic and Oriental Regions. No *Paralimosina* species is known from the New World. *Leptocera (Scotophilella) levigena* Spuler, 1925, assigned to *Paralimosina* by Roháček (1983) on the basis of its original description, belongs to the genus *Kimosina* Roháček, 1983 (S. A. Marshall, pers. comm., 1986). On the other hand, *Paralimosina* is represented in the Afrotropical Region by several unnamed species (examined) and most probably also in the Australian Region. Judging from the species diversity of *Paralimosina* discovered in SE Asia, further undescribed species can be expected there and in adjacent areas. The gaps in our knowledge of some of the regional faunas precluded construction of a reliable phylogenetic hypothesis for *Paralimosina*. However, the relationships (if recognized) are discussed under each species reviewed here (in alphabetical order).

KEY TO THE IDENTIFICATION OF PARALIMOSINA SPECIES

- 1 Apterous species without halteres and with broad abdomen Wings (sometimes shortened) and halteres present; abdomen not strikingly broad 3 2 (1) M-shaped mark on frons well developed, velvety, dark brown. Abdomen with shining, hardly tomentose, terga with long pale setae. Male genitalia (Figs 34–38), female postabdomen (Figs 39-42, 45, 46) P. ceylanica (L. PAPP) M-shaped mark not developed. Body, including abdomen, with dense greyish brown microtomentum, dull. Abdominal terga with short, dark setae. Male genitalia (Figs 124-127), female postabdomen (Figs 128-132) P. sexsetosa (L. PAPP) 3 (1) M-shaped mark not developed; from unicolorous. Fore tarsomeres 2-5 white to yellowish white, contrasting with dark mt_1 M-shaped mark distinct, usually velvety, dull (rarely subshining — P. indica sp. n.), black to brownish orange; from variegated. Fore tarsus unicolorous 4 (3) Frons fuscous ochreous. Wings somewhat shortened, with diffuse dark brown spots. Large species (body length 2.8 mm), with thickened male f_1 and f_3 . Gonostylus (Fig. 82) with only thin long setae on posterior lobe. Male genitalia (Figs 61-64).
- Female unknown P. gigantea sp. n. Frons dark brown to black. Wings shortened or normal, without darker spots. Smaller species (body length less than 2.4 mm), male with slightly thickened f_1 and f_3 . Gonostylus with a robust seta on posterior lobe
- 5 (4) Only 1 ors and 2 ifr (anterior minute). f₃ and t₃ unicolorous, pale ochreous brown. Wings fully developed though sometimes narrowed and slightly shortened. Male genitalia (Figs 65–68), female postabdomen (Figs 70, 71, 74, 75)

P. icaros sp. n.

2 ors (anterior short) and 3 ifr (only middle long). f₃ and t₃ ochreous but dark brown on distal half. Wings dimorphic; brachypterous form often without t_p (Figs 47, 48). Male genitalia (Figs 49-52), female postabdomen (Figs 53, 54, 57, 58)

P. dimorpha sp. n.

- 6 (3) Wings broader, R4+5 sinuate and apically arched, curving to C (see Roнáčeк 1977: Figs 35-37)
- Wings narrower, R4+5 sinuate but apically straightened (see Roháček 1977:
 Figs 38-40)
 - 7 (6) Wing membrane milky whitish; veins strikingly pale, hyaline. Male postgonite strongly curved and male S5 with an additional small posterior sclerite (Roháček 1983: Figs 365, 367). Gonostylus as in Fig. 81

P. macedonica (ROHÁČEK)

- Wing membrane yellowish to brownish, veins coloured. Male postgonite never so strongly curved and S5 without additional posterior sclerite
- 8 (7) Most of frons orange, only M-shaped mark, orbits and ocellar triangle reddish brown to brown. Antennae orange. Male genitalia (Figs. 20-24), female postabdomen (Figs 25-27, 31-33)
 P. brevis sp. n.
- Frons at most orange or reddish in anterior half; M-shaped mark much darker, brown to black. Antennae brown
 - 9 (8) t₂ with a pd seta in the middle (Fig. 87). M-shaped mark subshining, with reticulate microsculpture. Male S5 (Fig. 86) posteromedially projecting as a triangular lobe. Male subanal plate with antler-like branching scale-like setae (Fig. 83). Female postabdomen (Figs 77–80)
 P. indica sp. n.
- t₂ without middle pd seta (Fig. 93). M-shaped mark velvety, dull and tomentose.
 Male S5 not projecting and subanal plate with thin paired ventral setae (cf. Fig. 91) 10
- 10 (9) Frons anteriorly brown to black. Thorax and abdomen densely and roughly punctured. Male gonostylus as in Fig. 60, its posterior lobe with a robust internal spine P. subcribrata (Roháček)
- Frons with orange to reddish anterior areas, in front of the M-shaped mark. Thorax and abdomen not strongly punctured. Male gonostylus without posterior internal spine
- 11 (10) *R4+5* slightly curving to *C*. Male *S6* with peculiar ventromedial quadrilobate process (Fig. 97). Gonostylus posteriorly with thin long setae (Fig. 96) and postgonite very dark (Fig. 92). Female *T10* unusually dark, cerci long (Fig. 98); spermathecae voluminous, with large terminal invaginations (Fig. 100)

P. lobata sp. n.

- R4+5 strongly curving to C. Male S6 ventrally simple. Gonostylus (Fig. 59) posteriorly with 3-4 robust spine-like setae; postgonite paler. Female T10 pale, cerci small; spermathecae without terminal invaginations (see ROHÁČEK 1983: Figs 345-349)

 P. fucata (RONDANI)
- 12 (6) Antennae yellowish to brownish orange, similar in colour to frons. Head, including face and gena, golden orange to orange brown, only occiput darker brown

 13
- Antennae brown to blackish brown, contrasting with orange red anterior part of frons. Head brown to blackish brown on posterior half of frons; also face and gena usually darker, although sometimes reddish brown
- 13 (12) Antennae darker, orange brown. Two *ors* in normal position. Fore tarsus yellowish brown. t_2 with a mid ventral seta (Fig. 116). Male S5 posteromedially projecting in a cut lobe (Fig. 109). Gonostylus (Fig. 110) with clubbed posterior lobe and postgonite (Fig. 108) with rounded apex. Female unknown.

P. marshalli sp. n.

Antennae paler, yellowish orange. Two ors arising close to each other. Fore tarsus whitish yellow. t₂ without mid ventral seta (Figs. 18, 19). Male S5 simple (Fig. 7). Gonostylus (Fig. 8) with tapered posterior lobe and postgonite (Fig. 11) with pointed apex. Female terminalia (Figs 12–16) P. bracteata sp. n. 14 (12) Eyes very small and flat, their diameter smaller than genal height (see RoнÁček 1983: Fig. 376). Gonostylus as in Fig. 90 P. kaszabi L. PAPP Eyes larger, their greatest diameter at least twice as long as smallest genal height. Gonostylus different 15 (14) t₂ with mid ventral seta (cf. Fig. 116). Anterior lobe of gonostylus with long, anterodorsal, finely haired projection (Fig. 113) P. japonica HAYASHI t₂ always without mid ventral seta but males with a row of short ventral spines in apical 3rd or 4th (Figs 112, 118). Anterior lobe of gonostylus different 16 (15) Males 17 21 Females (females of *P. acris* sp. n., *altimontana* and *minor* sp. n. unknown) 17 (16) S5 strongly prolonged posteromedially (see HAYASHI 1985: Fig. 10) 18 S5 not prolonged, at most sinuously margined posteriorly (Fig. 2) 19 18 (17) Head paler. Gonostylus (Fig. 76) with posterior lobe densely covered with relatively short setae. Postgonite (Roháček 1977: Fig. 31) not curved but with tubercles on P. altimontana (ROHÁČEK) apex Head darker, particularly in posterior half. Gonostylus (Fig. 114) with 4 strong, long setae on anteroventral corner of posterior lobe. Postgonite (HAYASHI 1985: Fig. 12) distinctly curved, apex simple P. prominens HAYASHI 19 (17) S6 ventrally with 2 tooth-like processes (Fig. 1). Subanal plate with a long caudal seta and very weak paired ventral setae (Fig. 4); posterior lobe of gonostylus with long setae S6 ventrally simple (Fig. 119). Subanal plate with a short caudal seta and paired ventral setae flattened and scale-like; posterior lobe of gonostylus with short setae (Fig. 120) 20 (19) Gonostylus (Fig. 6); fore lobe with sharply projecting anteroventral corner; posterior lobe caudally tapered, with shorter setae. Postgonite very robust, almost straight (Fig. 5) P. acris sp. n. Gonostylus (Fig. 106); fore lobe robust, anteroventrally shallowly incised; posterior lobe more robust, with longer setae. Postgonite more slender, slightly bont (Roнáčек 1983: Fig. 382) P. trichopyga (RICHARDS) 21 (16) Eyes smaller, their diameter about twice as long as the smallest genal height. Abdominal terga not sculptured. T10 and S8 much larger, long (HAYASHI 1985: Figs 14, 15) P. prominens HAYASHI Eyes larger, their diameter nearly three times as long as smallest genal height. Abdominal terga with transverse, microsculpture. T10 very short and S8 much smaller, rounded triangular (Roháček 1983: Figs 387, 389)

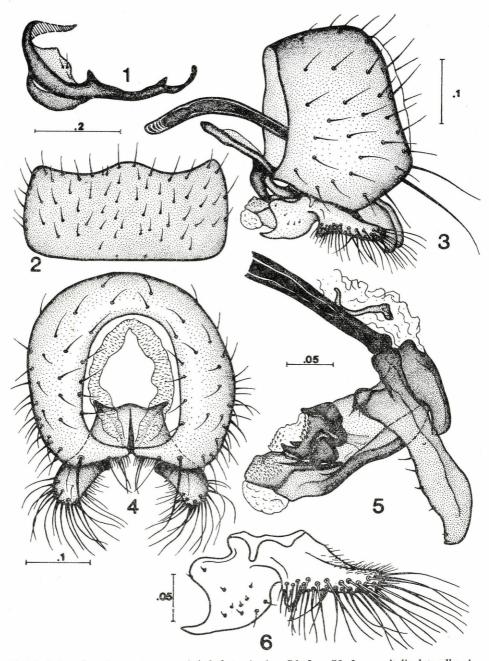
REVIEW OF THE SPECIES OF PARALIMOSINA

1. Paralimosina acris sp. n. (Figs 1-6, 111, 112)

Туре material — Holotype ♂: Южн. Приморье, 40км Ю-В Уссурийска, 11. VIII. 1984, труп лягушки, 10.000 – 11.00, А. Озеров (ZMUM).

Description— Male. Total body length 2.06 mm; general colour dark brown. Frons largely dark brown, orbital plates, ocellar triangle and adjacent area with silvery grey microtomentum; also interfrontalia greyish tomentose; anterior part of intraorbital area orange, except for the

P. trichopyga (RICHARDS)



Figs 1–6. Paralimosina acris sp. n. (\bigcirc^3 , holotype): 1=86, 2=S5, 3= genitalia laterally, 4= external genitalia caudally, 5= aedeagal complex laterally (right postgonite omitted), 6= gonostylus laterally. — Scales: Figs 1, 2=0.2 mm, Figs 3, 4=0.1 mm, Figs 5, 6=0.05 mm.

M-shaped, velvety black, dull mark. Frontal lunule ochreous brown, yellowish microtomentose; face dark brown, gena partly reddish brown, occiput blackish brown. Cephalic chaetotaxy: pvt minute and hair-like; 2 usual ors; 3 ifr, anterior thin and short, middle and posterior moderately long; g well developed. Eyes not much reduced, their diameter about twice as long as smallest genal height. Antennae dark brown, 1st flagellomere with dense and long cilia; arista three times as long as antenna, with short cilia.

Thorax dark brown, with brownish grey microtomentum. Two dc, the posterior long, the anterior less than twice as long as dc microsetae; 8 rows of ac microsetae. Scutellum comparatively long, its length 0.7 of its width. Apical sc long and arising on small tubercles; lateral sc as long as scutellum length. Two stpl, but the anterior only slightly longer than the several additional setulae on sterno-pleuron. Legs largely dark brown but knees, apices of tibiae and all tarsi reddish brown. f_1 and f_3 slightly thickened. t_2 chaetotaxy as in Figs 111, 112, with a row of short ventral spines terminated by reduced va. The ratio $t_2: mt_2 = 1.65$. Wing pale brownish, C brown, other veins very pale brown. R2+3 and R4+5 sinuate, the latter proximally curved, distally straightened. Coloured extension of M1+2 beyond tp very short but with a long colourless fold; brown process of M3+4 much longer. Wing measurements: length 2.23 mm, width 1.00 mm, C-index = 1.12, ta-tp: tp = 1.88. Halteres yellow.

Abdomen blackish brown, rather shining, despite greyish brown microtomentum. S5 (Fig. 2) simple, with sinuate posterior margin and short dense setae. S6 (Fig. 1) with 2 tooth-like processes on

its stripe-like ventral part.

Genitalia — Periandrium (Figs 3, 4) long, ball-shaped, uniformly setose. Subanal plate reduced and fused with periandrium, carrying a very long caudal bristle and very weak fine paired ventral setae. Gonostylus (Fig. 6) — posterior lobe more slender and with long hair-like setae and some micropubescence; anterior lobe flat and projecting in a slender, acute anteroventral process. Aedeagal complex (Fig. 5) with short, ventrally rounded phallophore. Distiphallus composed of a dorsal sclerite armed by some teeth and projections and a larger ventral sclerite connected with apical, less sclerotized part. Postgonite very robust and wide, subapically somewhat widened, with several minute setulae at anterior margin; its rounded apex with a small tubercle. Ejaculatory apodeme S-shaped but very slender.

Etymology—Named according to acutely projecting anterior lobe of gonostylus.

Distribution: USSR (Far East).

D is c u s s i on — The species seems to be closely related to the European P. trichopyga, chiefly because of the similar external characters, aedeagal complex and male S5 and S6. See the key for differences between them.

2. Paralimosina altimontana (Roháček, 1977) (Fig. 76)

Limosina altimontana Roháček, 1977: 411–415, (male only), 400 (Fig. 15), 412 (Fig. 25), 414 (Fig. 31), 417 (Fig. 39).

Paralimosina (Paralimosina) altimontana: Roháček, 1983: 50 (comb. n.).

Type material — Holotype of: Nepal, Taplejung distr., below Sangu, c 6000 ft., 30 10 1961, by stream in shady ravine, Brit. Mus. East Nepal Exp. 1961-62, R. L. Coe leg. (BMNH) (examined).

New records — Nepal: $28^{\circ}00'$ N, $85^{\circ}00'$ E, $1 \circlearrowleft 20$. May 1967, 10,500 ft., Malaise trap 6, Can. Nepal Exped. (BRI). Pakistan: Swat, Malam Jabba, $1 \circlearrowleft 9$. V. 1983, 2300 m (No.4c), Besuchet et Löbl leg. (MHNG).

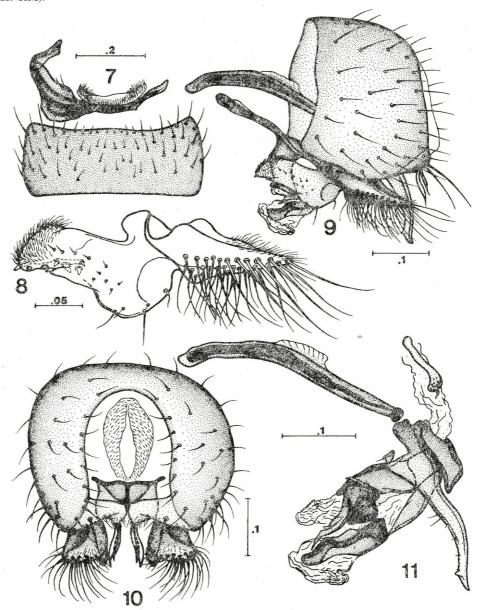
Supplement to description— Male S5 projecting posteromedially only slightly less than that of *P. prominens*; S6 with a simple, short, transverse, finely haired, membraneous lobe behind its stripe-like ventral part. Male subanal plate with 2 pairs of very widened scale-like ventral setae. The figure of the gonostylus (Fig. 76) is based on a new male from Nepal. The female is unknown.

Distribution: Nepal (Roháček 1977), Pakistan (new).

Discussion — Apparently, P. prominens is the sister-species of P. altimontana; both these species share a similar aedeagal complex, gonostylus, male S5 as well as external characters.

3. Paralimosina bracteata sp. n. (Figs 7-19)

Type material — Holotype \neg ': Nepal, Ktmd., Godavari, 6000', 17. VII. 1967, Mal. Tr., Can. Nepal. Exp. (BRI). — Paratypes: same locality, $1 \bigcirc 14$. VII. 1967; $2 \bigcirc 25$ 20. July 1967; $1 \bigcirc 3$. VIII. 1967; $1 \bigcirc 45$ 2 $\bigcirc 55$ same locality, 5000', 29. VI. 1967, all Can. Nepal Exp. (BRI, JRO, HNHM).

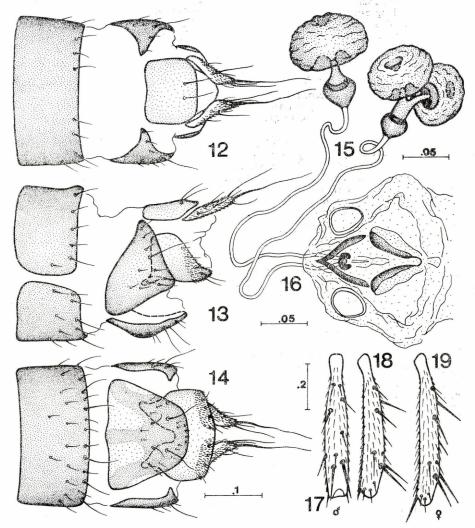


Figs 7-11. Paralimosina bracteata sp. n. ($\sqrt{\ }$, paratype): 7=S5 and S6, 8= gonostylus laterally, 9= genitalia laterally, 10= external genitalia caudally, 11= aedeagal complex laterally. — Scales: Fig. 7=0.2 mm, Fig. 8=0.05 mm, others =0.1 mm.

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Description — Male. Total body length 2.03-2.42 mm; general colour dark brown, with brownish grey tomentum, but head golden orange. Frons dull except for slightly shining, yellow longitudinal stripe on frontal triangle and yellow interfrontalia. M-shaped mark pale brownish orange to brown. Frontal lunule and face paler, gena darker orange; occiput reddish brown. Cephalic chaetotaxy: pvt small but distinct; 2 ors closely situated to each other; 3 ifr, the middle longer than other two; g well developed. Eyes medium-sized, their longest diameter about 2.2 times as long as smallest genal height. Antennae yellowish orange, with 1st flagellomere darkened in apical half; arista only 2.2 times as long as antenna, with cilia of medium length.

Thorax brown to dark brown, with brownish grey microtomentum. Two dc, but anterior small, slightly longer than dc microsetae. Eight to ten rows of ac microsetae between anterior dc. Scutellum large, relatively long (its length 0.68 of its width), rounded; both sc long. Two stpl, the posterior very long; disc of sternopleuron with several small setulae. Sternopleuron usually paler than meso-



Figs 12–19. Paralimosina bracteata sp. n. (\bigcirc \bigcirc , paratypes): 12 = female postabdomen dorsally, 13 = ditto laterally, 14 = ditto ventrally, 15 = spermathecae, 16 = spectacles-shaped sclerite ventrally, 17 = male left t_2 dorsally, 18 = ditto anteriorly, 19 = female t_2 anteriorly. — Scales: Figs 12–14 = 0.1 mm, Figs 15, 16 = 0.05 mm, others = 0.2 mm.

pleuron. Legs with brown coxae; femora dark, tibiae paler brown; trochanters, knees and tarsi yellowish, fore tarsi whitish yellow. f_1 slightly thickened. t_2 chaetotaxy as in Figs 17, 18, ventrally without row of spines but with reduced va; middle pd well developed. f_3 slightly thicker than in female. The ratio $t_2: mt_2 = 2.05-2.22$. Wing distinctly brownish, veins yellowish brown. R2+3 and R4+5 sinuate, the latter apically straight. Discal cell large, widened in the middle; coloured extensions of M1+2 and M3+4 beyond tp short but continued by colourless fold. Wing measurements: length 1.83-2.22 mm, width 0.87-0.92 mm, C-index = 1.02-1.15, ta-tp:tp=1.56-1.76. Halteres yellow with darker knob.

Abdomen cylindrical, relatively narrow. Terga dark brown, microtomentose but without microsculpture. Sterna becoming wider posteriorly, dark and as tomentose as terga. S5 (Fig. 7) simple, finely setulose; S6 with a membraneous, short, finely haired lobe posterior to its stripe-like

ventral part.

Genitalia — Periandrium (Figs 9, 10) long, globose, rather densely setulose. Subanal plate with moderately long caudal bristle and also the paired scale-like ventral setae not very widened. Gonostylus (Fig. 8) short and wide, with slender long-haired posterior lobe and its flat anterior lobe with finely pubescent fore rounded margin and internally with about 6–7 short robust spines. Aedeagal complex (Fig. 11). Phallophore short, ventrally acute. Distiphallus with complex, anteriorly projecting dorsal sclerite; ventroapical sclerite subapically tuberculate. Postgonite very slender, apically pointed, with a subapical tubercle and several minute setulae on anterior margin. Ejaculatory apodeme well developed though pale.

Female. Similar to male except for more slender f_1 and f_3 and long va on t_2 (Fig. 19). Total body length 2.14–2.98 mm, t_2 : $mt_2 = 1.85-1.94$. Wing measurements: length 1.98–2.74 mm, width 0.91–1.23 mm, *C*-index = 0.98–1.08, ta-tp: tp = 1.43–1.80. Abdomen flatter than in male, with wider preabdominal terga.

Postabdomen (Figs 12-14) small, relatively narrow from 7th segment. *T10* very pale, roughly oblong, with 2 long setuale. *S8* large, long, shield-shaped, with characteristic pigmentation. *S10* broad, pale, with deep anterior incision, connected with spectacles-shaped sclerite (Fig. 16) being composed of central sclerotized part and 2 relatively small rings. Spermathecae (Fig. 15) large, vesiculate, with wrinkled surface and shallow apical invagination. Terminal parts of ducts very bulbous, inserted into basal invagination of spermathecae. Cerci slender, with long apical and dorso-preapical sinuate setae and some shorter hairs.

Etymology — The specific epithet reflects the golden orange colour of the head.

Distribution: Nepal.

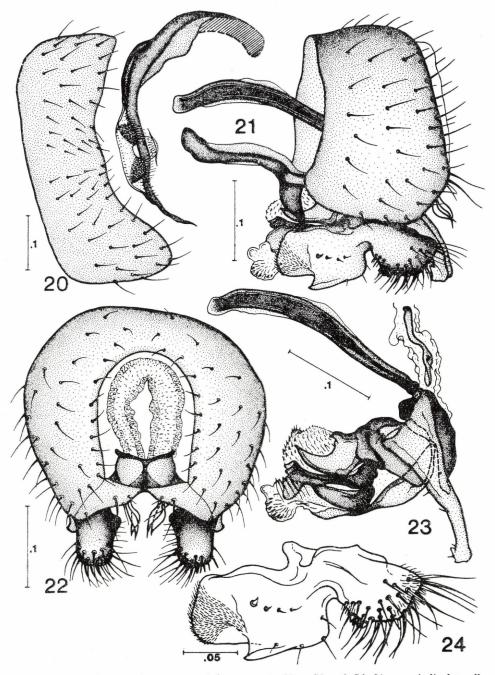
Discussion — *P. bracteata* sp. n. resembles *P. marshalli* sp. n. in most external features including the orange head, but the differences in the male genitalia seem to be too large to consider them sister-species.

4. Paralimosina brevis sp. n. (Figs 20–33)

Type material — Holotype \circlearrowleft : Nepal, nr. Birganj Lothar, 11. IX. 67, 450′, Mal. trap, Can. Nepal Exped. (BRI). — Paratypes: ? ? 4 \circlearrowleft with the same data (BRI, JRO, HNHM).

Description — Male. Total body length 1.52–1.90 mm; general colour dark brown, except for head. Frons orange, only orbits, M-shaped mark and ocellar triangle reddish brown to brown. Interfrontalia very narrow and yellowish white tomentose. Orbits and brown occiput with greyish silver microtomentum. Frontal lunule and carina yellowish orange, face reddish brown with some diffuse brown hue; gena orange brown, with greyish microtomentum. Cephalic bristles thick but not long; chaetotaxy: pvt very small, hair-like; 2 usual ors: 3 ifr, the anterior minute, middle and posterior moderately long; g relatively long. Eyes not much reduced, their diameter 2.38 times as long as smallest genal height. Antennae rather short, scape and pedicel orange, 1st flagellomere darker brownish on apex and covered with grey cilia. Arista moderately long, more than twice as long as antenna.

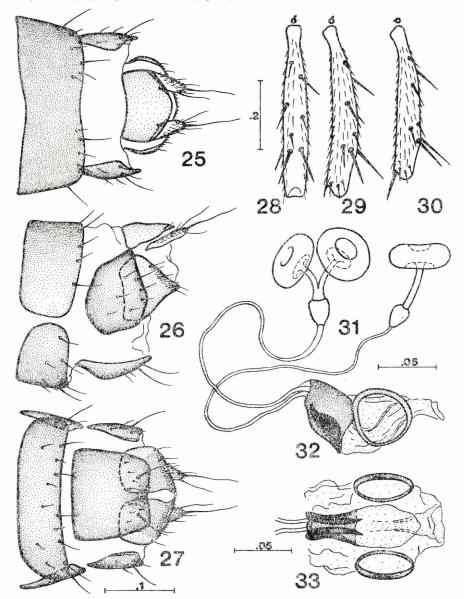
Thorax dark brown, mesonotum covered by dark tomentum. Two dc but anterior very small; 10-12 rows of densely arranged ac microsetae. Scutellum large, its length 0.66 of its width; sc thin but long, lateral sc being as long as scutellum. Two stpl, the anterior one comparatively long; sternopleuron with some additional scattered setulae. Legs mainly dark brown but t_1 , fore tarsi, mt_3 and hind second tarsomere and ventral side of other tarsal parts red or brownish red. t_2 chaetotaxy as in Figs 28, 29, ventrally with only much reduced va. Legs rather robust, f_1 and f_3 somewhat thickened. The ratio $t_2: mt_2 = 1.87-1.97$. Wings broad, very pale brownish, veins yellowish, C brown.



Figs 20–24. Paralimosina brevis sp. n. (\bigcirc ⁴, paratype): 20 = S5 and S6, 21 = genitalia laterally, 22 = external genitalia caudally, 23 = aedeagal complex laterally, 24 = gonostylus laterally. — Scales: Fig. 24 = 0.05 mm, others = 0.1 mm.

R2+3 and R4+5 sinuate, the latter rather strongly curving to C (similarly to that of P. macedonica). Coloured extensions of M1+2 and M3+4 beyond tp very short or that of M1+2 missing. Wing measurements: length 1.45-1.60 mm, width 0.64-0.72 mm, C-index = 0.90-0.93, ta-tp: tp = 1.46-1.64. Halteres reddish yellow or ochreous.

Abdomen somewhat more shining than mesonotum, with fine grey microtomentum. Sterna relatively narrow, sparsely setulose. S5 (Fig. 20) simple, shortly setose, medially with a shallow



Figs 25–33. Paralimosina brevis sp. n. ($\nearrow Q$, paratypes): 25 = female postabdomen dorsally, 26 = ditto laterally, 27 = ditto ventrally, 28 = male left t_2 dorsally, 29 = ditto anteriorly, 30 = female t_2 anteriorly, 31 = spermathecae, 32 = spectacles-shaped sclerite laterally, 33 = ditto ventrally. — Scales: Figs 25–27 = 0.1 mm, Figs. 28–30 = 0.2 mm, others = 0.05 mm.

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emargination. S6 characterized by its bipartite, membraneous, finely tuberculate and haired lobe

on its stripe-like ventral part.

Genitalia — Periandrium (Figs 21, 22) large, irregularly ball-shaped, with narrow anal fissure and rather short setae. Subanal plate reduced, its caudal setae short and weak, paired scale-like setae flattened but not large. Gonostylus (Fig. 24) with large anterior flat lobe armed with a ventral tooth and bearing a finely haired anterior area; posterior lobe small and shortly setose and with several short spines anteroventrally. Aedeagal complex (Fig. 23) with short, ventrally recurved and somewhat projecting phallophore. Dorsal sclerite of distiphallus robust, with an apical large pointed process and a small dorsal process. Ventral sclerite connected with complex sclerites apically. Membraneous part of distiphallus laterally fringed and with fine setulae. Postgonite slender, pale, with 2 small teeth on apex and several minute setulae at anterior margin. Ejaculatory apodeme rather long but slender.

Female. Similar to male but femora less thickened and t_2 with long va (Fig. 30). Total body length 1.38–1.81 mm, ratio t_2 : $mt_2=1.74-1.77$. Wing measurements: length 1.26–1.53 mm, width 0.60–0.70 mm, C-index = 0.96–1.02, ta-tp: tp=1.20–1.83. Abdomen more shining than mesonotum, with similar fine greyish tomentum. Tergal bristles comparatively short and sterna rather narrow.

Postabdomen (Figs 25–27) narrow with long sclerites. T7 simple, longer than S7. T10 pale pigmented, convex, relatively long but with reduced dorsal setulae. S8 large, as long as wide, with 2 long setae besides minute setulae. S10 wider than S8, very deeply and narrowly incised anteriorly. Spectacles-shaped sclerite (Figs 32, 33) with only medial part strongly sclerotized; rings large, situated aslant and pale pigmented. Spermathecae (Fig. 31) tyre-shaped, with apical and basal impressions, simple surface. Terminal parts of spermathecal ducts relatively long, slender and slightly bulbously thickened. Cerci rather small, widely separated, each with a long sinuate apical and shorter other hairs.

Etymology — The name refers to the short body of the species.

Distribution: Nepal.

Discussion — The affinity of *P. brevis* sp. n. to other *Paralimosina* species is not clear. Perhaps species with similar pubescence on fore part of gonostylus (e. g. *P. marsh alli* sp. n., *P. bracteata* sp. n., *P. ceylanica*) could be more closely related to it.

5. Paralimosina ceylanica (L. PAPP, 1979) comb. n. (Figs 34-46)

Hackmaniella ceylanica L. PAPP, 1979: 369-370, Fig. 8.

Type material — Holotype of: Ceylan, [Sri Lanka], Central: Horton Plains, 2100 m, 15. II. 1970, No. 68, leg. Mussard, Besuchet et Löbl (MHNG) (examined). For paratypes see L. Papp (1979) (all examined).

New records — Ceylon: Central Prov., Horton Plains, 7000 ft., 12 mls SSE Nuwara-Eliya, 7 \circlearrowleft 8 \circlearrowleft 19. VII. 1962 (loc. 163), indigeneous forest, sifted in debris; 1 \circlearrowleft 19.–20. VII. 1962 (loc. 162), all Lund Ceylon Exp. (ZIL, HNHM).

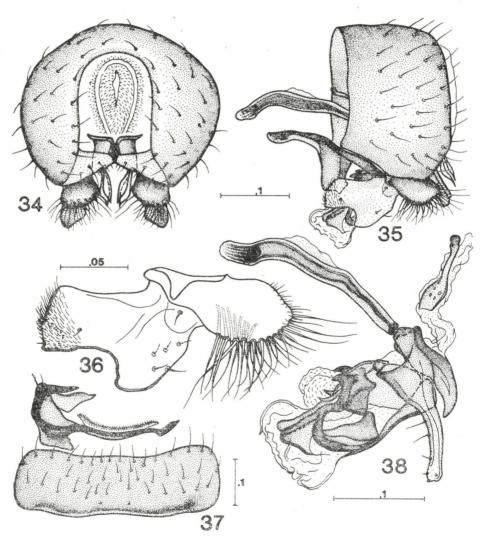
Description — An apterous species with brown, velvety dull M-shaped mark anteriorly reaching to frontal lunule; very short scutellum; whitish tarsomeres 2-5 of fore leg; broad, convex, shining black but finely reticulate terga with long pale setae. t_2 chaetotaxy (Figs 43, 44) not essentially different from other *Paralimosina* species, but with rather long va even in males. Male S5 (Fig. 37) simple, shortly setose. S6 with a short, transverse, finely pubescent membraneous lobe behind its stripe-like ventral part.

Male genitalia — Periandrium (Figs 34, 35) relatively small, ball-shaped, shortly setose. Hypandrium short, asymmetrical but with robust ventral appendage. Subanal plate with much reduced caudal bristle and well developed scale-like ventral paired setae. Gonostylus (Fig. 36) with small posterior lobe, setose mainly ventrally and posteriorly. Anterior lobe of gonostylus large, flat, ventrally emarginate and anteriorly finely pubescent externally and with a row of short small internal spines. Aedeagal complex (Fig. 38) with ventrally pointed phallophore. Distiphallus with paired teeth on dorsal sclerite; its ventral sclerite connected apically with finely serrate sclerites. Postgonite pale, slender, apically blunt, with a small tubercle and some 4 setulae at anterior margin. Ejaculatory apodeme rather large.

Female postabdomen (Figs 39, 40) — T6 much wider and darker than T7. T10 pale, transverse but rather large, with 2 small dorsal setulae. S7 posteriorly tapered, transverse, narrower than

S6. S8 rounded trapezoidal, wider than long, with 2 longer setae. S10 about as wide as S8, pale pigmented, anteriorly deeply incised medially. Spectacles-shaped sclerite (Figs 45, 46) with large dark medial part (somewhat similar to that of P. indica sp. n.) but rings hyaline, almost invisible because of their perpendicular position. Spermathecae (Fig. 42) vesiculate, with simple surface and small terminal invagination. The single spermatheca much larger than paired ones. Sclerotized terminal parts of spermathecal ducts robust and bulbously thickened. Accessory glands relatively large (Fig. 41). Cerci small, with reduced setosity, only apical sinuate hair longer.

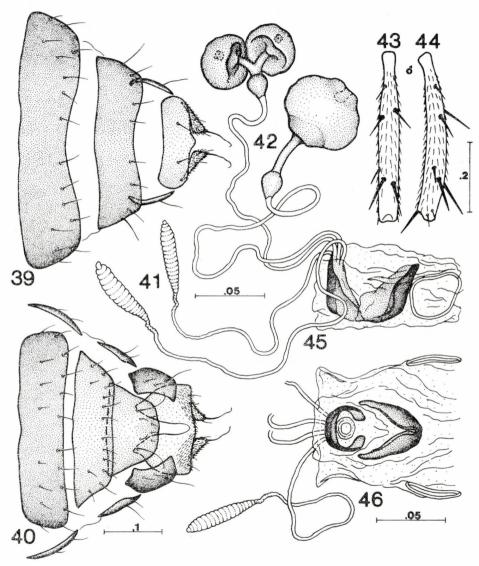
Distribution: Ceylon (L. PAPP 1979).



Figs 34–38. Paralimosina ceylanica (L. PAPP) (\circlearrowleft , paratype): 34 = external genitalia caudally, 35 = genitalia laterally, 36 = genostylus laterally, 37 = S5 and S6, 38 = aedeagal complex laterally. — Scales: Fig. 36 = 0.05 mm, others = 0.1 mm.

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D is c us s i on — This wingless species seems to be related to several fully-winged species, e. g. to *P. bracteata* sp. n., *P. marshalli* sp. n. or *P. brevis* sp. n. on the overall similarity of the male genitalia but none of them forms a distinct sister-pair with it. *P. ceylanica* is decidedly not closely related to the second apterous *Paralimosina*, viz. *P. sexsetosa* from Japan.



Figs 39–46. Paralimosina ceylanica (L. Papp) (\circlearrowleft \circlearrowleft , paratypes): 39 = female postabdomen dorsally, 40 = ditto ventrally, 41 = accessory glands, 42 = spermathecae, 43 = male left t_2 dorsally, 44 = ditto anteriorly, 45 = spectacles-shaped sclerite laterally, 46 = ditto ventrally. — Scales: Figs 39, 40 = 0.1 mm, Figs 43, 44 = 0.2 mm, others = 0.05 mm.

6. Paralimosina dimorpha sp. n. (Figs 47-58)

Type material — Holotype of: India: W. Bengal, Tonglu, 3100 m, 16. X. 78, Besuchet et Löbl leg. (No. 16b "tamisage dans une petite forêt at au pied d'arbustes dans le pâturage") (MHNG). — Paratypes: 1 of 1 ♀ India, W. Bengal, Ghoom, Tigerhill, 2500-2600 m, 18. X. 78, Besuchet et Löbl leg. (No. 19 "tamisage dans la forêt près du sommet") (JRO, MHNG); 1 ♀ India, Daitari, Orissa, 600-700 m, 23. XI. 1967, erdei avarból = from forest litter, leg. Topál (HNHM); 1 ♀ India, Uttar Pradesh, Kumaon: Chaubattia, 1800 m, 12.–13. X. 79, I. Löbl leg. (No. 10 "près Ranikhet, tamisage dans forêt, feuilles mortes, fougères et mousses") (MHNG); 1 of 2 ♀ E. Nepal, Kosi, Kuwapani, 2350 m, 5. V. 84, Löbl et Smetana leg. (No. 5 "ravin, tamisage de feuilles mortes le long d'un tronc abattu") (MHNG, HNHM, JRO); 1 of 1 ♀ E. Nepal, Kosi, Mangsingma, 2200 m, 11. IV. 84, Löbl et Smetana leg. (No. 13 "tamisage de feuilles mortes, mousses et bois pourri") (MHNG, HNHM); 1♀ E. Nepal, Kosi, Mangmaya, 2800 m, 7. IV. 84, Löbl et Smetana leg. (No. 8b "tamisage de feuilles de bambous et le rhododendrons près d'une source") (MHNG); 1 of Nepal, Kathmandou distr., Phulcoki, 2600-2700 m, 15. X. 83, Löbl et Smetana leg. (No. 36 "forêt assez sèche, tamisage des champignons sur des troncs de chênes morts, at de feuilles et bois pourri de long des troncs") (MHNG); 1 of 1 of Nepal, Bagmati, Malemchi, 2900 m, 14. IX. 81, Löbl et Smetana leg. (No. 23 "forêt de chênes, tamisage de bois pourri et de feuilles mortes") (MHNG).

Description — Male. Total body length 1.55-1.93 mm. General colour dark brown with sparse bronze tomentum, subshining. Frons and all other parts of head dark brown, almost black, sparsely tomentose and rather shining; M-shaped mark not visible. Cephalic chaetotaxy: bristles rather robust; pvt absent; 1 longer posterior and 1 short anterior ors; 3 ifr, anterior short, middle long and thick, posterior very short and thin. Eyes not reduced, their longest diameter about 2.4-2.6 times as long as smallest genal height. Antennae ochreous to pale brown, particularly apex of 1st flagellomere darkened; pedicel not longer than 1st flagellomere; arista 2.45 times as long as antenna.

Thorax dark brown, mesonotum subshining, pleurae dull. Thoracic chaetotaxy: 1 dc, 6–8 rows of ac microsetae. Scutellum large, its length about 0.6 times its width; apical sc only slightly longer than lateral sc, the latter being as long as scutellum. Only 1 stpl but disc of sternopleuron with 2–3 short setulae in addition. Legs ochrous or yellowish brown (including cx_1); t_1 , mt_1 , distal half of f_3 and distal two-fifths to half of t_3 dark brown to black; fore tarsomeres 2–5 white or whitish yellow. f_1 and f_3 not much thickened. t_2 chaetotaxy as in Figs 55, 56, ventrally without a row of spines but with a mid ventral seta and rather long va. The ratio t_2 : $mt_2 = 1.71$. Wings polymorphic (Figs 47, 48) light brown, veins ochreous to light brown (C distinctly brown). R2+3 and R4+5 sinuate, the latter curving to C apically. Discal cell closed or open (in f. brach.) without tp. M1+2 with a long but colourless fold beyond tp, M3+4 with a short, brown extension. Wing measurements: length 0.66–1.14 mm, width 0.23–0.47 mm, C-index = 0.70–1.25, ta-tp:tp=1.90 (f. macropt.). Halteres yellow with ochreous knob.

Abdomen subcylindrical, blackish brown, more shining than mesonotum. Sterna wide, nearly meeting terga laterally. S5 (Fig. 49) simple, wide, dark, sparsely setulose. S6 with a very short,

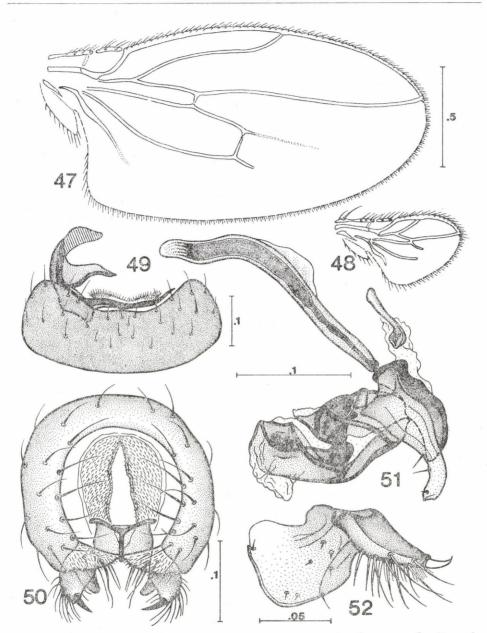
membraneous, finely haired stripe beyond its ventral slender part.

Genitalia — Periandrium (Fig. 50) rounded, long setulose; its anal fissure larger than in *P. icaros.* Subanal plate small; caudal hair-like seta rather long but paired ventral setae reduced, thin. Gonostylus (Fig. 52) with large, flat, pale, anteriorly rounded fore lobe and narrow, backwardly tapered posterior lobe terminated into a robust inwardly curved spine. Aedeagal complex (Fig. 51) with dark, robust phallophore with rounded ventral apex. Distiphallus with short dorsal sclerite with a double triangular process; its ventral sclerite complex and prolonged to apex of distiphallus where it bears a group of dark tubercles. Postgonite short, somewhat bent, pale, with 3 setulae at anterior margin and a minute tooth on apex. Ejaculatory apodeme well developed.

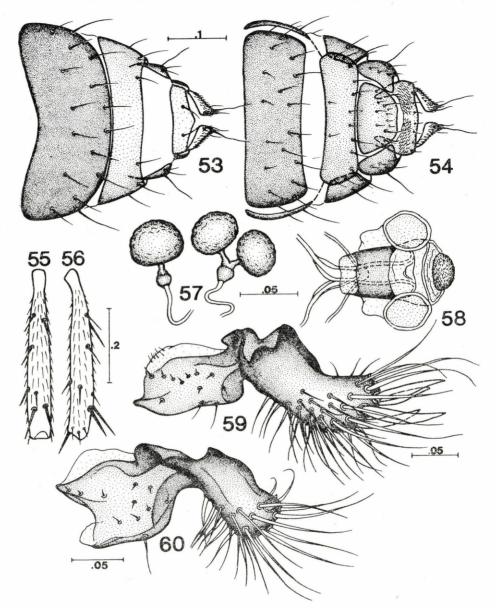
Female — Total body length 1.52–2.38 mm; t_2 : $mt_2 = 1.78-1.88$. t_2 with only slightly longer va. Wing measurements: length 0.72–1.92 mm, width 0.31–0.93 mm (wing dimorphic as in male); C-index = 0.90–1.23, ta-tp: tp = 1.75–2.00 (f. macropt.). Abdomen flattened, with large terga

and wide sterna, both almost meeting laterally.

Postabdomen (Figs 53, 54) with dark and large S6 and T6. T7 shortened (but less than that of P. icaros) and pale pigmented. T10 transverse, very pale, with a pair of dorsal setae. S7 short, relatively lightly pigmented. S8 rounded trapezoidal but not long. S10 somewhat wider than S8, anteriorly deeply and broadly emarginate. Spectacles-shaped sclerite (Fig. 58) with simply pigmented medial part, comparatively small rings, and strongly thickened basal parts of spermathecal ducts (the duct to single spermatheca much thicker). Spermathecae (Fig. 57) simply ball-shaped to oval, with



Figs 47–52. Paralimosina dimorpha sp. n. (\bigcirc^{τ} \bigcirc , paratypes): 47 = wing (f. macropt. \bigcirc), 48 = wing (f. brach. \bigcirc^{τ}), 49 = male S5 and S6, 50 = male external genitalia caudally, 51 = aedeagal complex laterally, 52 = gonostylus laterally. — Scales: Figs 47, 48 = 0.5 mm, Fig. 52 = 0.05 mm, others = 0.1 mm.



Figs 53–60. Paralimosina dimorpha sp. n. (¬¬ Q, paratypes): 53 = female postabdomen dorsally, 54 = ditto ventrally, 55 = male left t₂ dorsally, 56 = ditto anteriorly, 57 = spermathecae, 58 = spectacles-shaped sclerite ventrally. — Fig. 59. P. fucata (Rondani) (¬¬, Czechoslovakia), gonostylus laterally. — Fig. 60. P. subcribrata (Roháček) (¬¬, Czechoslovakia), gonostylus laterally. — Scales: Figs 53, 54 = 0.1 mm, Figs 55, 56 = 0.2 mm, others = 0.05 mm.

sparsely wrinkled surface and terminally bulbously thickened ducts. Cerci short, with rather shortened setae including the long apical sinuate hair.

Etymology — The species is named according to its wing dimorphism.

Distribution: India, Nepal.

Discussion — *P. dimorpha* sp. n. is most closely allied to *P. icaros* sp. n. and probably forms with it a sister-pair (shared synapomorphies: shortened postgonite, short female *S8*); *P. gigantea* sp. n. and *P. sexsetosa* also seem to be its relatives. All these species form a monophyletic group diagnosed by the absence of M-shaped mark on frons, shortened female postabdomen and thickened basal part of spermathecal duct to the single spermatheca.

P. dimorpha sp. n. is the only known *Paralimosina* species with dimorphic wings. This phenomenon, however, is well known in several other genera of *Limosininae*, e. g. in *Pullimosina*, *Pteremis*, *Spelobia*, *Puncticorpus* etc.

7. Paralimosina fucata (RONDANI, 1880) (Fig. 59)

Limosina fucata Rondani, 1880: 31 (male only). — Limosina (Scotophilella) verticella auct. nec Stenhammar, 1854. — Paralimosina (Paralimosina) fucata: Roháček, 1983: 52–53 (redescription and synonymy), 193–195 (Figs 333–336, 339–351)

Type material — Holotype \circlearrowleft : labelled "1943" (red numeral on oval label) (MSF) (examined).

New records — Austria: Rekawinkl, 1 \circlearrowleft (no collector); Switzerland: Biasca (TI), 1 \circlearrowleft 11.–19. 8. 1981, H. Jungen leg.; Yugoslavia: Velebit, 1 \circlearrowleft 2 \circlearrowleft 5. VII. (no collector) (HNHM); Ohrid, 1 \circlearrowleft 6.–8. 9. 1979, G. Bächli leg. and coll.; Algeria: Les Cascade (El Ount), 6 km E of Tlemcen, 1 \circlearrowleft 20. VI. 1980, 860 m, O. Dely leg. (HNHM); Iran: Rasht, 11 \circlearrowleft 6 \circlearrowleft 28.–29. 6. 1962, W. Götz leg. (G. Bächli coll.; HNHM).

Distribution: Throughout the Western Palaearctic: England, Spain, France, Belgium, FRG, GDR, Poland, Czechoslovakia, Denmark, Hungary, Austria, Switzerland (both new), Italy, Yugoslavia (new), Bulgaria, Tunisia, Algeria (New) and Iran (easternmost record, new), see also Roháček (1983) and L. Papp (1984, 1985).

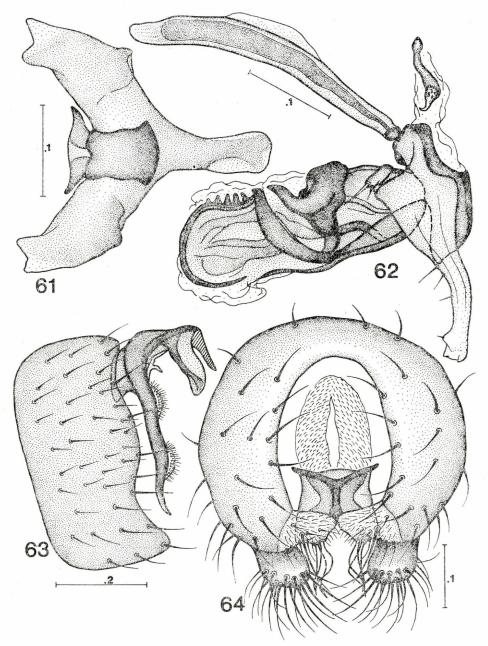
D i s c u s s i o n — The relationships of *P. fucata* are obscure; even the closest species, viz. *P. subcribrata* and *P. macedonica* appear to be rather distantly allied to it.

8. Paralimosina gigantea sp. n. (Figs 61-64, 92, 104, 105)

Type material — Holotype ♂: India, W. Bengal, Ghoom, Tigerhill, 2500–2600 m, 18. X. 78, Besuchet et Löbl leg. (No. 19 "tamisage dans la forêt près du sommet") (MHNG).

Description — Male. Total body length ca 2.8 mm. General colour dark brown. Frons fuscous ochreous, occiput brown. M-shaped mark not visible. Frontal lunule and face light brown, gena brown, mouthparts darker brown. Cephalic chaetotaxy: pvt absent; vti long and thick; 3 ifr, anterior and posterior minute, middle very strong, horn-like. Two ors rather close to each other. Eyes reduced, their longest diameter about 1.9 times as long as smallest genal height. Antennae ochreous, 1st flagellomere rather conical, with a dorsal arista. Arista 2.3 times as long as antenna, with short cilia.

Thorax shining, dark brown (contrasting with legs), and with a diffuse lighter brown spot each on notopleuron and on the border between ptero- and hypopleuron. One strong dc; about 8 rows of ac microsetae. Scutellum large and comparatively long; apical as well as lateral sc long. One strong (posterior) stpl but sternopleuron with some short setulae on disc. Legs mainly ochreous yellow but t_1 and t_3 brown, t_2 , mt_1 and mt_3 and distal third of t_3 light brown; fore tarsomeres 2–5 whitish. t_1 much thickened but mid and hind legs also robust. t_2 chaetotaxy as in Figs 104, 105, with a reduced va but mid ventral seta and a row of thicker setae between it and va present; posteroventral row of



Figs 61–64. Paralimosina gigantea sp. n. (\circlearrowleft , holotype): 61 = hypandrium ventrally, 62 = aedeagal complex laterally, 63 = S5 and S6, 64 = external genitalia caudally. — Scales: Fig. 63 = 0.2 mm, others = 0.1 mm.

spine-like bristles on f_2 stronger than usual. The ratio $t_2:mt_2=1.78$. Wing shortened, light brown, with diffuse darker brown spots on tp, distally to ta on R4+5 and in 1st and 2nd radial cell. Veins brown, C darker. R2+3 and R4+5 sinuate, the latter apically slightly curving to C. Venal extensions of MI+2 and M3+4 beyond tp distinct, darker brown, the latter somewhat longer than tp. Wing measurements: length 1.49 mm, width 0.67 mm, C-index = 0.86, ta-tp: tp = 1.77. Halteres ochreous.

Abdomen dark brown, shining, subcylindrical, slightly flattened dorsally. Sterna large. S5 long, with shallow emargination on both sides of posterior margin (Fig. 63); S6 with 2 small, membraneous

finely haired lobes behind its ventral stripe-like part.

Genitalia — Periandrium (Fig. 64) large, ball-shaped, with relatively narrow anal fissure. Subanal plate with medium-long caudal seta and flattened scale-like ventral paired setae. Intraperiandrial sclerite rather long. Hypandrium (Fig. 61) very robust, with stout lateral arms and compact ventral appendage. Gonostylus (Fig. 82) bilobed; its posterior lobe smaller, with long and dense hair-like setae; anterior lobe large, flat, anteriorly projecting into a pointed process. Aedeagal complex (Fig. 62). Phallophore robust, ventrally tapered but not pointed; distiphallus rather long, with reduced membraneous parts, simply projecting dorsal sclerite and sclerotized apical portion carrying a row of 5 dark dorsal teeth. Postgonite large (little shorter than aedeagal apodeme), pale, slightly sinuously margined, with several tubercles on apex and some setulae at anterior margin. Ejaculatory apodeme distinct.

Female unknown.

Etymology— The species is named "gigantea" because it is the largest among its closest relatives.

Distribution: India.

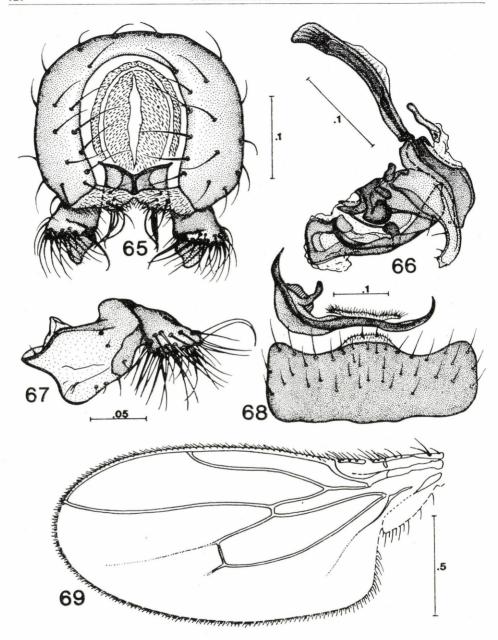
Discussion — P. gigantea sp. n. perhaps forms a sister-group with P. sexsetosa, P. icaros sp. n. and P. dimorpha sp. n. in view of the absence of a thickened seta on the posterior lobe of the gonostylus. More precise evaluation of its position needs knowledge of the female. P. gigantea sp. n. is unique in Paralimosina in having somewhat maculated wings.

9. Paralimosina icaros sp. n. (Figs 65-75)

Type material — Holotype \mathcal{J} : India, Uttar Pradesh, Kumaon: Chaubattia, 1800 m, 12.–13. X. 1979, I. Löbl leg. (no. 10 "près Ranikhet, tamisage dans la forêt, feuilles mortes, fougéres et mousses") (MHNG). — Paratypes: 2 \mathcal{J} 4 \mathcal{Q} same data (MHNG, HNHM, JRO); 1 \mathcal{J} India, Uttar Pradesh, Kumaon: Rangahr, 2000 m, 9. X. 79, I. Löbl leg. (No. 6b "ravin boisé; tamisage des feuilles mortes") (MHNG); 1 \mathcal{J} 1 \mathcal{Q} Nepal, Bagmati, Phulchauki, 2300 m, 10. V. 81, Löbl et Smetana leg. (No. 66 "tamisage de feuilles mortes et de branches pourriers au pied de chênes et sous les arbustes") (MHNG); 1 \mathcal{J} Nepal, Bagmati, Malemchi, 2800 m, 14. IV. 81, Löbl et Smetana leg. (No. 24 "tamisage de branches pourriers, feuilles mortes, herbe et mousses au pied d'une muraille près du village" (MHNG); 1 \mathcal{J} E. Nepal, Kosi, Mangsingma, 2200 m, 11. IV. 84, Löbl et Smetana leg. (No. 13 "ravin, tamisage de feuilles mortes, mousses et bois pourri") (MHNG).

Description — Male. Total body length 1.67–2.15 mm; general colour dark brown, with greyish bronze microtomentum. Frons and all other parts of head shining dark brown to black. M-shaped mark not developed. Cephalic chaetotaxy: pvt absent; only 1 ors; vte, vti and oc strong; only 2 ifr, 1 minute anterior and 1 thick, long middle (no posterior pair); g weak; vi as long as vti. Eyes not very small, their longest diameter about 2.4 times as long as smallest genal height. Antennae long, orange yellow, with darkened tip of 1st flagellomere; pedicel as long as 1st flagellomere, the latter conical and with long cilia. Arista short, only 1.9 times as long as antenna, with short cilia.

Thorax dark brown, microtomentose. Only 1 dc, 6-8 rows of ac microsetae. Scutellum longer than half of its width (length: width = 0.62-0.67); apical sc about twice as long as laterals. One stpl but sternopleuron with some scattered setulae. Coxae and trochanters ochreous, t_1 and mt_1 dark brown, fore tarsomeres 2-5 white or whitish yellow; all femora, t_2 and t_3 pale ochreous brown. t_1 and t_3 slightly thickened; t_2 long. The ratio t_2 : t_2 = 1.67. Wing (Fig. 69) yellowish brown, veins ochreous, t_3 brown. t_3 brown and t_3 sinuate, the latter slightly upcurving apically. Venal extension of t_3 beyond t_4 beyond t_5 long but colourless, that of t_3 coloured and short. Wing measurements: length 1.48-1.85 mm, width 0.60-0.78 mm, t_3 coloured and short t_4 beyond t_5 with whitish yellow stem.

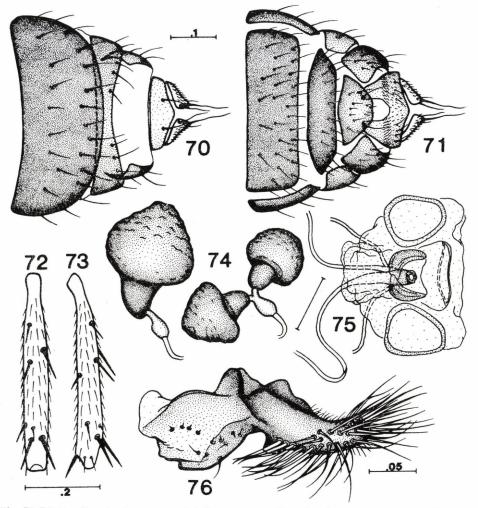


Figs 65–69. Paralimosina icaros sp. n. (\circlearrowleft , paratype): 65 = external genitalia caudally, 66 = aedeagal complex laterally, 67 = gonostylus laterally, 68 = S5 and S6, 69 = wing. — Scales: Fig. 67 = 0.05 mm, Fig. 69 = 0.5 mm, others = 0.1 mm.

Abdomen dark brown, shinier than thorax. Tl + 2 with a large central tomentose spot. Sterna as in P. dimorpha sp. n., S5 (Fig. 68) simple, but posteromedially with membraneous bisetose lobe. S6 stripe-like, ventrally with a short, transverse, finely haired membraneous lobe.

Genitalia — Periandrium (Fig. 65) ball-shaped, rather long setose. Subanal plate small; caudal seta short and weak, ventral paired setae flattened, particularly the inner one. Gonostylus (Fig. 67) with large, flat anterior lobe with 2 projections on fore-margin; its posterior lobe small, long-setose, carrying a robust seta on its posterior apex. Aedeagal complex (Fig. 66). Phallophore short but robust, ventrally blunt. Distiphallus with complex dorsal sclerite bearing a paired anterior process; ventral sclerite long and connected with apical weakly sclerotized part. Postgonite short and wide, bent in distal third, with some tubercles on apex and several setulae at anterior margin. Ejaculatory apodeme small.

Female. Similar to male but f_1 and f_2 more slender. Total body length 1.95–2.38 mm, t_2 : $mt_2 = 1.83$. t_2 with proximal pd usually more distally situated and va longer. Wing measurements: length



Figs 70–76. Paralimosina icaros sp. n. $({}^{\checkmark}_{\circ})$, paratypes): 70 = female postabdomen dorsally, 71 — ditto ventrally, 72 = male left t_2 dorsally, 73 = ditto anteriorly, 74 = spermathecae, 75 = spectacles shaped sclerite ventrally. — Fig. 76. P. altimontana (Roháček) (${}^{\checkmark}_{\circ}$, Nepal), gonostylus laterally. — Scales: Figs 70, 71 = 0.1 mm, Figs 72, 73 = 0.2 mm, others = 0.05 mm.

1.54-1.92 mm, width 0.61-0.84 mm, C-index = 1.08-1.09, ta-tp:tp=2.50. Abdomen slightly

flattened, with broad, heavily sclerotized terga and sterna.

Postabdomen (Figs 70, 71) with dark, strongly sclerotized 6 th segment. T7 short, weakly sclerotized. T10 very pale, short, with a pair of setae. S7 transverse but darker than T7. S8 relatively small, rounded trapezoidal, with 2 longer setae and several smaller ones. S10 pale, wider than S8, anteromedially deeply incised. Spectacles-shaped sclerite (Fig. 75) with weakly sclerotized medial part and rather large rings. Spermathecal duct of the single spermatheca essentially widened in its basal portion (at spectacles-shaped sclerite). Spermathecae (Fig. 74) robust, the single one much larger than paired ones; each with bulbous body and rounded conical base. Terminal parts of ducts bulbously thickened. Cerci small, short, with a longer apical and a short dorso-preapical sinuate hairs.

Etymology—The name indicates that the species is fully winged in contrast to its closest relative *P. dimorpha* sp. n. which is often brachypterous.

Distribution: India, Nepal.

Discussion — As stated above, P. dimorpha sp. n. and P. icaros sp. n. appear to be sister-species. P. icaros sp. n. is remarkable in having reduced cephalic chaetotaxy (1 ors, 2 ifr).

10. Paralimosina indica sp. n. (Figs 77-80, 83-89)

Type material — Holotype \circlearrowleft : India, Uttar Pradesh, Gharwal: Dhanolti, 2250 m, 21. X. 1979, I. Löbl leg. (No. 19 "versant nord; près d'une source, tamisage de mousses et feuilles mortes sous les rhododendrons et les sapins") (MHNG). — Paratypes: $3 \circlearrowleft 2 \circlearrowleft$ with the same data (MHNG, HNHM, JRO).

Description—Male. Total body length 1.72–2.10 mm; general colour dark brown with dark greyish tomentum. Frons largely dark brown, intraorbital and supralunular areas reddish brown; interfrontalia, orbits, medial stripe and ocellar triangle greyish tomentose. M-shaped mark blackish brown, with subshining reticulate microsculpture, thus not velvety dull. Frontal lunule yellowish grey tomentose; gena below eye dark reddish brown, face and occiput dark brown. Cephalic chaetotaxy: pvt minute but distinct; 2 ors, the anterior shorter; 3 ifr, anterior short and thin, middle and posterior strong; g well developed. Eyes not much reduced, their longest diameter about 2.1 times as long as smallest genal height. Antennae dark brown, pedicel dark reddish brown medially; arista

2.3 times as long as antenna, with short cilia.

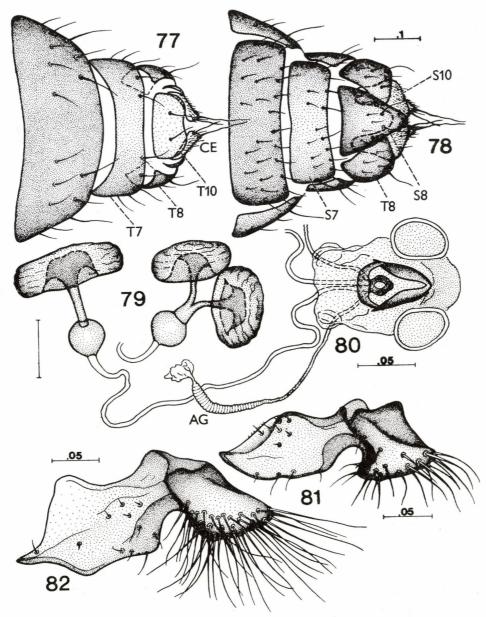
Thorax dark brown, subshining, mesonotum with dark greyish microtomentum, pleurae even more tomentose; notopleuron and subalar callus reddish. Two dc but anterior much reduced and dc microsetae between them slightly enlarged; ca 10 rows of ac microsetae. Scutellum large, 0.6 times as long as wide; sc long, also lateral sc longer than scutellum. Two stpl, the posterior one very long, the anterior one hardly longer than other setulae on sternopleuron. Legs dark brown, trochanters, knees and tarsi reddish. f_1 and f_3 thickened. f_2 chaetotaxy (Figs 87, 88); f_3 was much reduced and middle f_3 present. The ratio f_3 thickened. f_4 chaetotaxy (Figs 87, 88); f_4 much reduced and f_4 thickened. f_4 present. The ratio f_4 into f_4 chaetotaxy (Figs 87, 88); f_4 much reduced and f_4 the property of f_4 present. The ratio f_4 into f_4 chaetotaxy (Figs 87, 88); f_4 much reduced and f_4 present. The ratio f_4 into f_4 present. The ratio f_4 present f_4 property f_4 present f_4 present

Abdomen with blackish brown, rather shining terga. Sterna not very wide. S5 (Fig. 86) shortly setose, posteromedially projecting as a pointed lobe; S6 with simple membraneous and finely haired

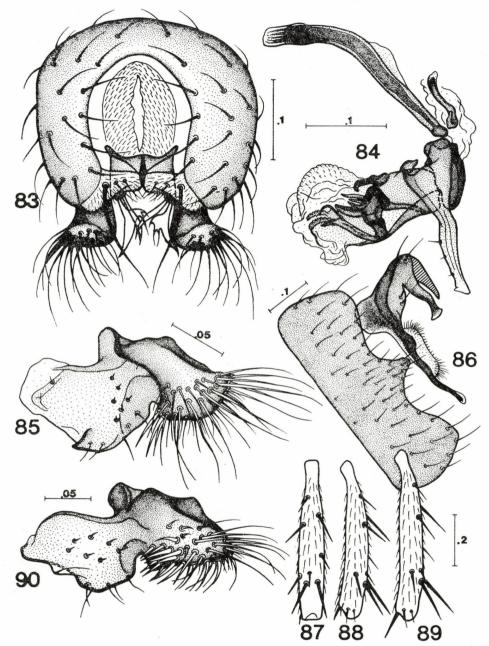
(particularly laterally) lobe behind its slender ventral part.

Genitalia — Periandrium (Fig. 83) ball-shaped, with long and numerous setae. Subanal plate small but carrying a very long caudal seta and flattened paired ventral setae, the outer of which is peculiarly branched (resembling an elk antler). Gonostylus (Fig. 85) with smaller posterior lobe densely overgrown by long hair-like setae; anterior lobe larger, flat, with rounded margin but with a tooth-like small process. Aedeagal complex (Fig. 84) with kidney-shaped phallophore and distiphallus armed with numerous teeth and processes on dorsal sclerite; its membraneous apical part relatively large. Postgonite slender, pale, sinuously margined, with a subapical tubercle and minute setulae at anterior margin. Ejaculatory apodeme medium sized.

Female. Total body length 1.87–2.26 mm, the ratio $t_2: mt_2 = 1.68-1.82$. t_2 with much longer va (Fig. 89). Wing measurements: length 1.71–2.05 mm, width 0.93–1.07 mm, C-index = not measurable, ta-tp: tp = 2.00-2.17. Abdominal terga shining.



Figs 77–82. Paralimosina indica sp. n. (\bigcirc , paratype): 77 = postabdomen dorsally, 78 = ditto ventrally, 79 = spermathecae, 80 = spectacles-shaped sclerite and accessory gland ventrally. — Fig. 81: P. macedonica (Roháček) (\bigcirc , paratype), gonostylus laterally. — Fig. 82: P. gigantea sp. n. (\bigcirc , holotype), gonostylus laterally. — Scales: Figs 77, 78 = 0.1 mm, others = 0.05 mm. Abbreviations: AG = accessory gland, CE = cerci, S = sternum, T = tergum.



Figs 83–90. Paralimosina indica sp. n. (\circlearrowleft \circlearrowleft , paratypes): 83 = male external genitalia caudally, 84 = aedeagal complex laterally, 85 = gonostylus laterally, 86 = male S5 and S,6 87 = male left t_2 dorsally, 88 = ditto anteriorly, 89 = female left t_2 anteriorly. — Fig. 90. P. kaszabi L. Papp (\circlearrowleft , Czechoslovakia), gonostylus laterally. — Scales: Figs 85, 90 = 0.05 mm, Figs 87–89 = 0.2 mm, others = 0.1 mm.

Postabdomen (Figs 77,78). 6th segment much wider than 7th, with large T6. T7 short, sparsely setulose. T10 very pale, rounded transversely oblong, with distinct dorsal setae. S7 narrower than S6; S8 long, rounded triangular, very tapered posteriorly. S10 pale, wider than S8, anteriorly with a deep medial incision. Spectacles-shaped sclerite (Fig. 80) with dark pigmented medial part (similar to that of P. ceylanica) but rings pale pigmented. Spermathecae (Fig. 79) very large, disc- to tyre-shaped, finely wrinkled, with basal invagination in which sclerotized parts of ducts are inserted; the latter strongly bulbously thickened. Cerci short, but each with long sinuate apical hair and shorter dorsopreapical one.

Etymology — The species is named after the country of its origin.

Distribution: India.

Discussion — *P. indica* sp. n. shows some affinity to *P. kaszabi* and less affinity to *P. trichopyga*, e. g. in the form of the phallophore, the pale slender postgonite, the long caudal setae on the male subanal plate, the female *S8*, *S10* and spermathecae, but it differs in some striking characters, such as the branching scale-like setae on the male subanal plate, the projecting male *S5* or spectacles-shaped sclerite being more similar to that of *P. ceylanica*.

11. Paralimosina japonica Hayashi, 1985 (Fig. 113)

Paralimosina (Paralimosina) japonica HAYASHI, 1985: 329-331, 330 (Fig. 1), 332 (Figs 3-9).

Type material — Holotype \circlearrowleft : Japan, Hachioji, Tokyo, 6. X. 1983, T. Hayashi (NITI) (not examined). — For paratypes see HAYASHI (1985); two of them were examined (1 \circlearrowleft 1 \circlearrowleft JRO)

New records — Japan: Shikoku, Ishizuchi Mt. N. P., Tsuchigoya, 1400 m, 41 $_{\odot}$ 39 $_{\odot}$ 11.–18. viii. 1980, S. Peck leg. (GUE, JRO, HNHM, BRI). Pakistan: Swat, Malam Jabba, 2500–2600 m, 1 $_{\odot}$ 18. V. 1983, No. 17b, Besuchet et Löbl leg. (MHNG).

Supplement to description — Male S5 simple; S6 with a very short, band-like, membraneous finely haired lobe behind its ventral stripe-like part. Subanal plate with large, flattened, scale-like ventral paired setae.

Distribution: Japan (Hokkaido, Honshu - Hayashi 1985; Shikoku — new), Pakistan (new). Regarding the latter important record it seems plausible that *P. japonica* is widespread in SE Asia.

D is c ussion — P. japonica appears to be closely related to P. minor sp. n. from the Far East, both having similarly constructed distiphallus and finely haired anteriorly projecting fore lobe of gonostylus. For differences see under P. minor sp. n.

12. Paralimosina kaszabi L. PAPP, 1973 (Fig. 90)

Paralimosina kaszabi L. PAPP, 1973: 386 (female only). — Limosina latigena Roháček, 1977: 415. — Paralimosina (Paralimosina) kaszabi: Roháček, 1983: 56–57 (redescription and synonymy), 208 (Figs 376, 380), 211–212 (Figs 393–404).

Type material — Holotype ♀: Mongolia, Chövsgöl aimak, 6 km WNW von Somon Tosoncengel, 1480 m, Dr. Z. Kaszab, 18. VI.–20. VII. 1968 (Nr. 980) (HNHM) (examined); for paratypes see L. PAPP (1973). — L. latigena — Holotype ♂: Czechoslovakia, Bohemia, Krkonoše Mts., Vitkovice, 16. 8. 1958, from hay, J. Zuska leg. (NMP) (examined); for paratypes see Roháček (1977, 1983).

New records — C z e c h o s l o v a k i a: N. Moravia, Třinec, 1 $\, \bigcirc \,$ 10. 5. 1981; Nýdek-Střelma, 1 $\, \bigcirc \,$ 30. 7. 1984, pasture near forest; Daskabát env., 1 $\, \bigcirc \,$ 2. 4. 1983, damp meadow, all M. Barták leg. (JRO); E. Slovakia, Hostovické lúky res. (distr. Humenné), 2 $\, \bigcirc \,$ 19. 5. 1987, boggy meadow, J. Roháček leg. (SMO).

Distribution: Hitherto only known from Mongolia (L. Papp 1973, 1984) and Central Europe (Czechoslovakia, Austria — Roháček 1983). New to Slovakia.

Discussion — *P. indica* sp. n., *P. trichopyga*, *P. acris* sp. n. and perhaps also *P. lobata* sp. n. are relatives of *P. kaszabi* if the kidney-shaped robust phallophore is considered as a synapomorphic feature. This is not quite certain, however. *P. kaszabi* is an easily recognizable species with strikingly reduced eyes and prolonged legs.

13. Paralimosina lobata sp. n. (Figs 91–103)

Type material — Holotype of: Pakistan, Hazara, Naran, 2600 m, 1. VI. 1983, Besuchet et Löbl leg. (No. 33d "tamisage de feuilles mortes et de branches pourriers sous des marroniers") (MHNG). — Paratype ♀ Pakistan, Hazara, Shogran, 2400 m, 3. VI. 83, Besuchet et Löbl leg. (No. 37c "tamisage de feuilles mortes sous des arbustes, à l'orée de la forêt de pins") (MHNG).

Description — Male. Total body length 1.97 mm; general colour dark brown, with thick grey microtomentum. Frons variegated; orbits, ocellar triangle, interfrontalia and part of occiput silvery grey tomentose and glittering; intraorbital and supralunular areas orange reddish but M-shaped mark velvety dark brown. Gena dark brown as is occiput but the latter silvery glittering. Frontal lunule ochreous, face reddish brown. Cephalic bristles strong; chaetotaxy: pvt minute but visible; 2 usual ors, the anterior short; 3 ifr, anterior short, middle and posterior long but relatively thin. Eye-diameter about twice as long as smallest genal height. Antennae dark brown; 1st flagellomere with very long cilia on apex; arista about 2.9 times as long as antenna, with short cilia.

Thorax probably with only 1 dc (but some setae broken off in holotype); 8-9 rows of ac microsetae. Scutellum with length only 0.58 of its width. Apical sc longer than width of scutellum. One very long stpl; the anterior stpl reduced to almost indistinct. Legs dark brown, only knees, mt_3 and ventral surface of tarsi somewhat paler. f_1 and f_3 thickened. t_2 chaetotaxy as in Figs 93, 94; t_2 ventrally with a row of spines terminated by reduced va. The ratio $t_2: mt_2 = 1.52$, thus mt_2 very long. Wings light brown, veins slightly darker, C dark brown. R2+3 and R4+5 sinuate, the latter slightly curving to C. Discal cell broad; coloured extensions of M1+2 and M3+4 beyond tp shorter than tp. Wing measurements: length 1.62 mm, width 0.76 mm, C-index = 1.02, ta-tp:tp=1.92. Halteres yellow.

Abdomen blackish brown, rather shining. Preabdominal sterna (S3-S5) only somewhat narrower than terga. Tergal setosity rather short but comparatively dense. S5 with dense short setae; S6 ventromedially with a flat, ventrally projecting process carrying 4 rounded lobes (Fig. 97), the

laterals having some minute hairs.

Genitalia — Periandrium (Fig. 91) ball-shaped, with medium-sized anal fissure and relatively long setosity. Subanal plate reduced, with long caudal setae and thin, weak, paired ventral setae. Gonostylus (Fig. 96) highly diagnostic because of absence of ventral incision separating anterior and posterior lobe. Anterior lobe large, flat, with a projecting, acute, tooth-like anteroventral corner. Posterior lobe with dense long setae and with some pilosity posteriorly. Aedeagal complex (Fig. 92) with short, ventrally pointed phallophore. Distiphallus complex; its dorsal sclerite relatively small but with some processes; ventral sclerite projecting apically into two bent, distally twisted bands. Membraneous part of distiphallus large, dorsally finely spinulose. Postgonite large, long, very dark (almost black), slightly bent and apically pointed. Ejaculatory apodeme slender.

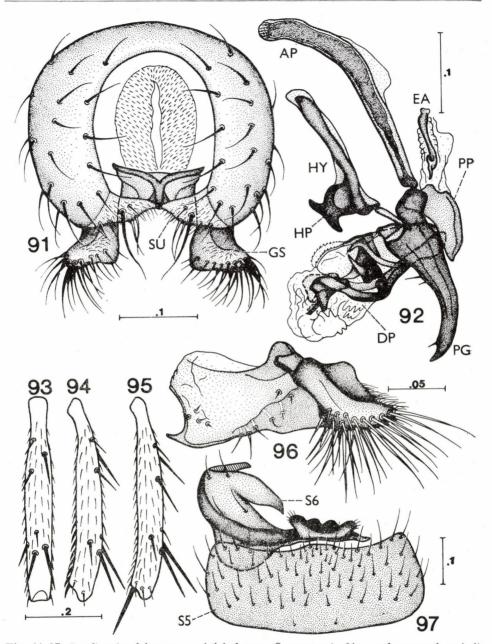
Female. Similar to male but legs thinner. Total body length 2.19 mm; ratio t_2 : $mt_2 = 1.61$. t_2 ventrally finely haired, with a long and strong va (Fig. 95). Wing measurements: length 1.67 mm, width 0.74 mm, C-index = 1.13, ta-tp: tp = 1.80. Abdomen flatter, sterna wide, nearly meeting

terga laterally.

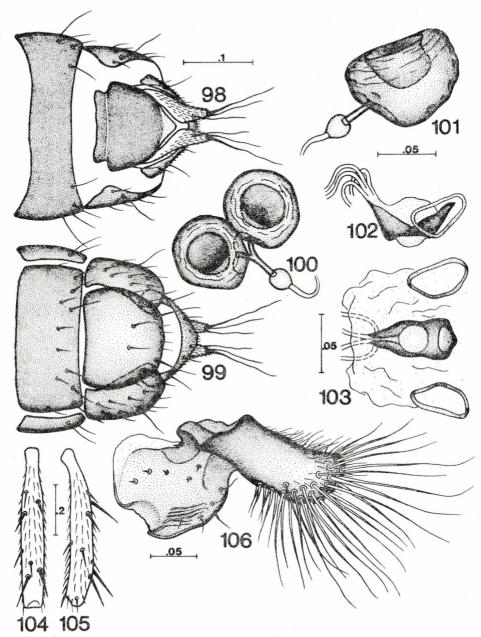
Postabdomen (Figs 98, 99) relatively narrow, with long sclerites. T7 and T8 darkly pigmented. T10 unusual, darkly pigmented, with a stripe-like anterior narrower part and pale, triangular, posterior apex. S8 long, convex, shield-shaped, with 2 longer setae. S10 reduced to a horseshoe-shaped sclerite. Spectacles-shaped sclerite (Figs 102–103) with heavily scleritized, dark but narrow medial part; rings widely separated and also pigmented. Spermathecae (Figs 100, 101) very voluminous, particularly the single one, each with large, deep, terminal invagination and somewhat wrinkled surface. Terminal parts of spermathecal ducts bulbously thickened but the connective duct between bulbs and body of spermathecae slender. Cerci long, slender, each with 3 very long sinuate hair-like setae.

Etymology—The name is derived from the uniquely lobate male S6.

Distribution: Pakistan.



Figs 91–97. Paralimosina lobata sp. n. (\circlearrowleft holotype, \circlearrowleft paratype): 91 = male external genitalia caudally, 92 = aedeagal complex and medial part of hypandrium laterally, 93 = male left t_2 dorsally, 94 = ditto anteriorly, 95 = female t_2 anteriorly, 96 = gonostylus laterally, 97 = male S5 and S6. — Scales: Figs 93–95 = 0.2 mm, Fig. 96 = 0.05 mm, others = 0.1 mm. Abbreviations: AP = aedeagal apodeme, DP = distiphallus, EA = ejaculatory apodeme, GS = gonostylus, HP = hypandrial process, HY = hypandrium, PG = postgonite, PP = phallophore, S = sternum, SU = subanal plate.



Figs 98–106. Paralimosina lobata sp. n. (\mathbb{Q} , paratype): 98 = postabdomen dorsally, 99 = ditto ventrally, 100–101 = spermathecae, 102 = spectacles-shaped sclerite laterally, 103 = ditto ventrally, — Figs 104–105. P. gigantea sp. n. (\mathbb{Q}^r , holotype): 104 = left t_2 dorsally, 105 = ditto anteriorly. — Fig. 106: P. trichopyga (Richards) (\mathbb{Q}^r , Czechoslovakia), gonostylus laterally. — Scales: Figs 98, 99 = 0.1 mm, Figs 104, 105 = 0.2 mm, others = 0.05 mm.

Discussion — A very distinctive species (peculiar four-lobed process on male S6; gonostylus without ventral incision; blackish postgonite; voluminous spermathecae; dark and long female T10 and very long female cerci) which shows some affinity to P. kaszabi, P. trichopyga and allies (see under P. kaszabi).

14. Paralimosina macedonica (Roháček, 1977) (Fig. 81)

Limosina macedonica Roháček, 1977: 406. — Paralimosina (Paralimosina) macedonica: Roháček, 1983: 54–55 (redescription), 193 (Fig. 337), 206–207 (Figs 364–375).

Туре material — Holotype of: Yugoslavia, Macedonia, Prespa Geul, Otesevo, 20.–27. 1958, edge of oak wood above lake, R. L. Coe leg. (BMNH) (examined); for paratypes see Rohá-ček (1977, 1983).

New records — H u n g a r y: Börzsöny hg., Szokolya, 1 \circlearrowleft 1 \circlearrowleft 18. VII. 1981, L. Papp leg.; G r e e c e: Pieria, Mt. Olympos, 4 km E Prioni, 1 \circlearrowleft 22. VI. 1982, R. Danielsson leg. (HNHM).

Distribution: Hungary (new, northernmost record), Yugoslavia, Bulgaria, Greece (new), Iran, Afghanistan (see L. PAPP 1978, 1984; ROHÁČEK 1983).

Discussion — The relationships of this striking species are not quite clear. It might have some affinity to P. fucata and P. subcribrata but surely is not closely allied to them.

15. Paralimosina marshalli sp. n. (Figs 107-110, 115, 116)

Type material — Holotype o': Nepal, Ktmd., Godavari, 6000', 20. July 1967, Can. Nepal Exped. (BRI).

Description — Male. Total body length ca 1.9 mm; general colour dark brown, with brownish bronze microtomentum. Head orange brown, with dark brown occiput. M-shaped mark dull brown, medially interrupted by orange longitudinal stripe; rest of frons also orange and dull, except for silvery glittering orbits, interfrontalia and medial part of frontal triangle. Cephalic chaetotaxy: pvt small but visible; 2 normal ors; 3 ifr, the anterior short; g well developed. Frontal lunule and dorsal part of carina yellowish ochreous; face and gena orange brown. Eyes medium-sized, their longest diameter about 2.3 times as long as smallest genal height. Antennae brownish orange, with conical 1st flagellomere; arista about 2.3 times as long as antenna, with moderate cilia.

Thorax dark brown, mesonotum more shining than dull pleurae. Scutellum flat, rounded, its length 0.7 of its width. Thoracic chaetotaxy: 2 dc but the anterior one short and weak; $8 ext{ rows of } ac ext{ microsetae}$; $sc ext{ very long}$; $2 ext{ stpl}$ but anterior small; sternopleuron with several setulae below anterior stpl. Legs with brown coxae, femora, t_2 and t_3 ; trochanters, t_1 , knees and tarsi yellowish to ochreous brown. f_1 and f_3 slightly thickened; t_2 chaetotaxy as in Figs 115, 116; va reduced but mid ventral seta present. The ratio $t_2: mt_2 = 2.00$. Wings distinctly brownish, with yellowish veins; R2+3 and R4+5 slightly sinuate, the latter apically straightened. Discal cell medium-sized, with short coloured extensions of Ml+2 and M3+4 beyond tp. Alula narrow. Wing measurements: length 1.67 mm, width 0.75 mm, C-index = 0.95, ta-tp: tp = 1.80. Halteres yellowish white.

Abdomen dark brown, sterna not very wide; terga broad, transverse, without distinct microsculpture. S5 somewhat projecting but cut posteromedially (Fig. 109); S6 with finely spinulose, transverse membraneous, laterally widened lobe and a narrow tongue-shaped plate behind its slender ventral part.

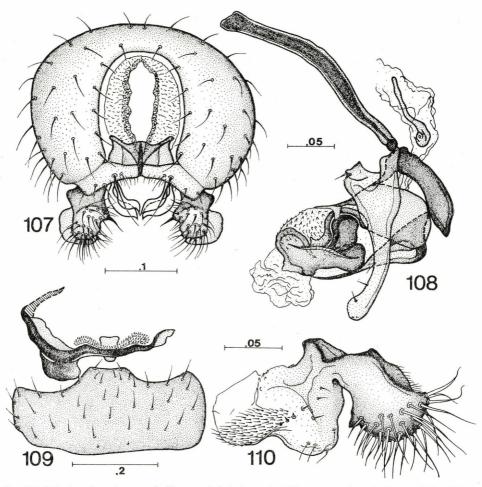
Genitalia — Periandrium (Fig. 107) ball-shaped, with rather small anal fissure. Subanal plate short, with medium long caudal bristles and 2 pairs of very widened scale-like ventral setae. Gonostylus (Fig. 110) with smaller, ventrally rounded posterior lobe having an anteroventral short process, relatively short setae and an internal thickened seta; its anterior lobe large, pale, rounded, with a finely spinulose ventroapical area. Aedeagal complex (Fig. 108) with short, ventrally pointed phallophore. Distiphallus complex; dorsally without sharp projections but with finely spinulose membrane and also its apex membraneous. Postgonite pale, long, slightly bent, with widened and rounded apex and 3 setulae at anterior margin. Ejaculatory apodeme well developed, with widened basal part.

Female unknown.

Etymology— The species is dedicated to Dr. Steve Marshall (GUE) in recognition of his valuable contribution to the knowledge of the systematics, phylogeny and biogeography of *Limosininae*.

Distribution: Nepal.

Discussion — *P. marshalli* sp. n. might be related to *P. bracteata* sp. n. but it mainly differs from the latter in the form of the aedeagal complex, male *S6* and gonostylus (see also discussion under *P. bracteata* sp. n.).



Figs 107–110. Paralimosina marshalli sp. n. (\bigcirc 7, holotype): 107 = external genitalia caudally, 108 = aedeagal complex laterally, 109 = S5 and S6, 110 = gonostylus laterally. — Scales: Fig. 107 = 0.1 mm, Fig. 109 = 0.2 mm, others = 0.05 mm.

16. Paralimosina minor sp. n. (Figs 117-121)

Туре material — Но l о t у р е \circlearrowleft : Амурская обл., г. Зея, 3. 3. IX. 1981, А. Шаталкин (ZMUM).

Description — Male. Total body length 1.36 mm; general colour black, with greyish to brown microtomentum. Head with dark brown occiput and posterior part of frons. Anterior part of frons, in front of the blackish M-shaped mark, orange; orbits and very narrow interfrontalia silvery grey. Cephalic chaetotaxy: pvt reduced, indistinct; 2 usual ors; 3 ifr, anterior small; g distinct but weak. Frontal lunule ochreous brown; face shining brown; gena paler than face, ochreous brown. Eye diameter about 2.9 times as long as smallest genal height. Antennae brown, base of

1st flagellomere paler; arista 2.4 times as long as antenna, with medium long cilia.

Thorax black, mesonotum rather shining despite some microtomentum; pleural part dull. Thoracic chaetotaxy: 2 dc but the anterior one hardly distinguishable from dc microsetae; 8 rows of ac microsetae; sc long; 2 stpl, the posterior one long but anterior one reduced to a microseta about as long as the 2 other setulae below it. Scutellum flat, rounded, its length about 0.64 of its width. Legs pale to dark brown; trochanters, knees and tarsi yellowish to ochreous. f_1 and f_3 somewhat thickened and darker. t_2 with a row of short ventral spines in apical half; chaetotaxy as in Figs 117, 118. The ratio $t_2: mt_2 = 2.21$. Wing with brownish membrane and yellowish brown veins. $R^2 + 3$ strongly sinuate; $R^4 + 5$ slightly sinuate and its apical part straight. Discal cell broad, with anterior outer corner slightly acute. Coloured extensions of MI + 2 and M3 + 4 beyond tp very short. Alula very narrow. Wing measurements: length 1.34 mm, width 0.61 mm, C-index = 0.73, ta-tp: tp = 2.08. Halteres yellow.

Abdomen with black, greyish brown tomentose, subshining terga. Sterna brown, more densely setulose and duller. S5 simple, transversely oblong, sparsely setulose. S6 with finely setulose membra-

neous lobe (Fig. 119) behind its ventral stripe-like part.

Genitalia — Periandrium globose, uniformly shortly setulose. Subanal plate with short caudal setae and 2 pairs of flattened, scale-like ventral setae. Gonostylus (Fig. 120) small; posterior lobe shortly setose and with small ventral projection. Anterior lobe flat, pale, of rhomboid form, with finely haired apex. Aedeagal complex (Fig. 121) composed of short, ventrally pointed phallophore and complex distiphallus armed with a number of teeth in its middle and with a tuberculate structure subapically. Postgonite slender, with cut apex, 2 setulae at anterior margin and some minute tubercles at tip. Ejaculatory apodeme well developed.

Female unknown.

Etymology — The name refers to the unusually small size of the species.

Distribution: USSR (Far East).

Discussion — P. minor sp. n. and P. japonica form a distinct sister-pair (for shared features see under P. japonica) but they differ in size (P. japonica is much larger — 2.1-3.0 mm), ventral chaetotaxy of male t_2 (P. japonica with mid ventral seta), and form and setosity of posterior lobe of gonostylus etc.

17. Paralimosina prominens HAYASHI, 1985 (Fig. 114)

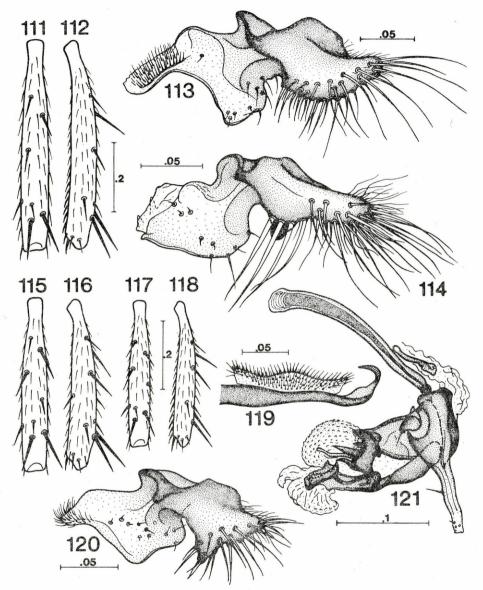
Paralimosina (Paralimosina) prominens HAYASHI, 1985: 331-333, 330 (Fig. 2), 333 (Figs 10-16).

Type material — Holotype \circlearrowleft : Japan, Mt. Takao, Tokyo, 22. vi. 1983, T. Hayashi leg. (NITI) (not examined). For paratypes see Hayashi (1985); two of them examined (1 \circlearrowleft +1 \circlearrowleft , JRO).

Supplement to description — Male S6 ventrally stripe-like but bent out posteromedially; behind this arch with a transverse, finely haired, membraneous lobe. Male subanal plate with scale-like ventral paired setae not very widened.

Distribution: Japan (Honshu, Hokkaido — HAYASHI 1985).

D is c u s s i o n — The species seems to be most closely allied to the Nepalese P. altimontana (see under that species).



Figs 111–121. Paralimosina acris sp. n. (\circlearrowleft , holotype): 111 = left t_2 dorsally, 112 = ditto anteriorly. — Fig. 113. P. japonica Hayashi (\circlearrowleft , Japan): gonostylus laterally, — Fig. 114. P. prominens Hayashi (\circlearrowleft , paratype): gonostylus laterally, — Figs 115–116. P. marshalli sp. n. (\circlearrowleft , holotype): 115 = left t_2 dorsally, 116 = ditto anteriorly. — Figs 117–121. P. minor sp. n. (\circlearrowleft , holotype): 117 = left t_2 dorsally, 118 = ditto anteriorly, 119 = ventral portion of S6, 120 = gonostylus laterally, 121 = aedeagal complex laterally. — Scales: Figs 111, 112, 115–118 = 0.2 mm, Fig. 121 = 0.1 mm, others = 0.05 mm.

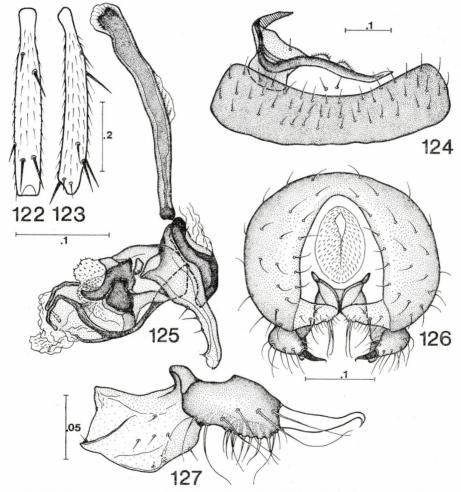
18. Paralimosina sexsetosa (L. PAPP, 1982) comb. n. (Figs 122-132)

Leptocera (Nipponsina) sexsetosa L. PAPP, 1982: 349-352, 348 (Fig. 1), 350-351 (Figs 2-13).

Type material — Holotype ♂: Japon, Shikoku, Ehime pref., Omogo, 500 m, 12. VIII. 1980, No. 15c, leg. C. Besuchet (MHNG) (examined). For paratypes see L. Papp (1982) (most of them examined).

Description — An apterous, densely greyish brown tomentose species without M-shaped mark on frons, with strongly widened abdominal sclerites and lacking the more distal one of the proximal ad on t_2 (see Figs. 122, 123). S5 (Fig. 124) very transverse, shortly setulose. A pair of setae medially in membrane behind S5; S6 small and its slender ventral part carrying 2 minute, very finely pubescent, membraneous lobes.

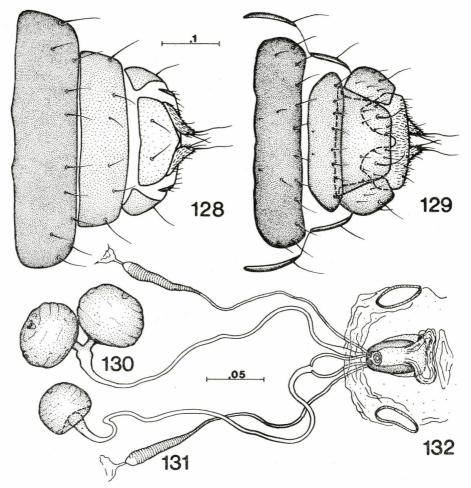
Male genitalia — Periandrium (Figs. 126) ball-shaped, with narrow anal fissure and short setae. Hypandrium with well developed ventral appendage. Subanal plate small; caudal setae weak



Figs 122–127. Paralimosina sexsetosa (L. PAPP) (Figs 124, 126 based on \mathcal{J} paratype, others on \mathcal{J} holotype): 122 = left t_2 dorsally, 123 = ditto anteriorly, 124 = S5 and S6, 125 = aedeagal complex laterally, 126 = external genitalia caudally, 127 = gonostylus laterally. — Scales: Figs 122, 123 = 0.2 mm, Fig. 127 = 0.05 mm, others = 0.1 mm.

and paired ventral setae thin but longer than caudal seta; the latter paired setae are flattened and scale-like (see L. PAPP 1982) only in specimens from Honshu (see discussion below). Gonostylus (Fig. 127) characterized by very robust posterior spine and otherwise finely setulose posterior lobe. Anterior lobe flat and pale, with slightly projecting anterior corners. Aedeagal complex (Fig. 125). Phallophore short, hardly pointed ventrally. Dorsal sclerite of distiphallus short, projecting in one curved tooth on each side; ventral sclerite prolonged to form 2 stripes bent dorsally and recurved ventrally at apex. Postgonite pale, sinuously margined; its rounded apex with 2 small tubercles and anterior margin with several setulae. Ejaculatory apodeme present (not figured).

Female postabdomen (Figs 128, 129) shortened and from 7th segment pale pigmented. T7 much narrower than T6. T10 comparatively large but very weakly sclerotized and pale; dorsal setae distinct. S7 short, essentially narrower than S6 and T7. S8 large but not long, rounded trapezoidal, with usual pair of longer setae. S10 pale, as wide as S8, anteriorly with deep medial incision. Spectacles-shaped sclerite (Fig. 132) weakly sclerotized in its medial part and rings rather small. Basal part of spermathecal duct of single spermatheca bulbously thickened near spectacles-shaped sclerite. Accessory glands (Fig. 131) slender. Spermathecae (Fig. 130) ball-shaped, with small terminal im-



Figs 128–132. Paralimosina sexsetosa (L. PAPP) (♀, paratype): 128 = postabdomen dorsally, 129 = ditto ventrally, 130 = spermathecae, 131 = accessory gland, 132 = spectacles-shaped sclerite ventrally. — Scales: Figs 128, 129 = 0.1 mm, others = 0.05 mm.

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pression and finely wrinkled surface; short sclerotized terminal parts of ducts little dilated. Single spermatheca smaller than paired ones. Cerci small; also their setae, including the apical sinuate hair, short and fine.

Distribution: Japan (Shikoku, Honshu — L. PAPP 1982).

D is c u s s i o n — P. sexsetosa belongs to a group of species without an M-shaped mark on frons. It forms, together with P. icaros sp. n. and P. dimorpha sp. n., a subgroup characterized by strongly thickened spine-like seta on the posterior lobe of the gonostylus, which is particularly robust in P. sexsetosa. Another distinctive feature of this species is the absence of one ad in the proximal part of t_2 .

P. sexsetosa was described from specimens from Shikoku and Honshu Is. The specimens from Honshu Is. display some differences which indicate that this population probably forms a separate subspecies. There are differences particularly in the armature of male subanal plate (Honshu specimens have scale-like flattened ventral setae—see L. PAPP 1982: Fig. 3), in the form of phallophore (ventrally more pointed in Honshu specimens—L. PAPP 1982: Fig. 8) and in the spermathecae (more bulbous terminal part of ducts—L. PAPP 1983: Fig. 5). However, more material from Honshu Is. is necessary to demonstrate this assertion as only 27 (one male apparently lost, the other, with incomplete genitalia, examined) were included in the type series of P. sexsetosa.

19. Paralimosina subcribrata (Roháček, 1977) (Fig. 60)

Limosina subcribrata Roháček, 1977: 407 (male only). — Paralimosina (Paralimosina) subcribrata: Roháček, 1983: 53–54 (redescription), 193 (Fig. 338), 203–205 (Figs 352–363).

Type material — Holotype ♂: Czechoslovakia, Moravia, Brno-Soběšice, 25. 7. 1973, burrow of vole in oak forest, J. Roháček leg. (JRO) (examined); for paratype ♂ see Roháček (1977, 1983).

New records — Czechoslovakia: E. Slovakia, Stakčín, $1 \circlearrowleft 1 \circlearrowleft 22.$ 6. 1983, $1 \circlearrowleft 3.$ 6. 1984; Ubla, $1 \circlearrowleft 23.$ 6. 1983; Ruský Potok, $1 \circlearrowleft 5.$ 8. 1985, $1 \circlearrowleft 10.$ 6. 1985, $1 \circlearrowleft 1 \circlearrowleft 5.$ 8. 1985 (on decayed fungi), J. Roháček leg. (SMO); Hungary: Bódvaszilas, Alsóhegy, $1 \circlearrowleft 1.$ IX. 1963, Horvatovich leg.; Mártély, ártéri erdő, $1 \circlearrowleft 7.$ VII. 1969, Draskovits leg.; Budakeszi, juhlegelő, ürgelyukból, $1 \circlearrowleft 14.$ IV. 1984, L. Papp leg.; Karakószörcsök, $1 \circlearrowleft 1.$ V. 1975, talajcsapda, Halmágyi leg. (HNHM); Yugoslavia: Durmitor Mt., Jaksika Katuni, $1 \circlearrowleft 2.$ VII. 1958, 1800 m, Mihályi leg. (HNHM).

Distribution: Central Europe (Czechoslovakia, Austria, Hungary, Yugoslavia), see also Roнáček (1983) and L. Papp (1984).

Discussion — An easily recognizable species from the rough punctures on its thorax and abdomen, the dark from and the distinctive gonostylus and spermathecae. It could be related to *P. fucata*.

20. Paralimosina trichopyga (RICHARDS, 1952) (Fig. 106)

Leptocera (Limosina) trichopyga Richards, 1952: 89 (male only). — Paralimosina (Paralimosina) trichopyga: Roháček, 1983: 55–56 (redescription), 208–210 (Figs 377–379, 381–392).

Type material — Holotype ♂: Austria, Bösensteingruppe, Nied. Tauern, Franz leg. (ВМNН) (examined); for paratype ♂ see RICHARDS (1952) and ROHÁČEK (1983).

Distribution: Austria, Czechoslovakia (Roháček 1983), Switzerland and France (L. PAPP 1985).

Discussion — The species is closest to P. acris sp. n. (see under that species).

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SPECIES DUBIAE

Limosina nitens Stenhammar, 1854: 368 (see Roháček 1977, 1983) Limosina verticella Stenhammar, 1854: 366 (see Roháček 1977, 1983)

TAXA REMOVED FROM THE GENUS PARALIMOSINA

Canarisina Roháček, 1983: 57 (as subg. of Paralimosina) = syn. n. of Aptilotus Mik, 1898.

Paralimosina anaptera L. Papp et Roháček, 1981 = Aptilotus anapterus (L. Papp et Roháček, 1981) (see Marshall, 1983)

Paralimosina avolans Roháček et L. Papp, 1983 = Aptilotus avolans (Roháček et L. Papp, 1983) comb. n.

Paralimosina beckeri (DUDA, 1918) = Aptilotus beckeri (DUDA, 1918) (see MARSHALL 1983)

Paralimosina franzi L. Papp et Roháček, 1981 = Aptilotus franzi (L. Papp et Roháček, 1981) (see Marshall 1983)

Paralimosina gomerensis L. Papp et Roháček, 1981 = Aptilotus gomerensis (L. Papp et Roháček, 1981) (see Marshall 1983)

Paralimosina levigena (SPULER, 1925) = Kimosina levigena (SPULER, 1925) comb. n.

Paralimosina pilofemorata L. Papp et Roháček, 1981 = Aptilotus pilifemoratus (L. Papp et Roháček, 1981) (see Marshall 1983)

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