

New species of Lygistorrhinidae (Diptera) from the Oriental Region

L. PAPP

*Department of Zoology, Hungarian Natural History Museum
and Animal Ecology Research Group of the Hungarian Academy of Sciences
H-1088 Budapest, Baross u. 13, Hungary. E-mail: lpapp@zoo.zoo.nhmus.hu*

Abstract – Two new species of *Matileola* L. PAPP, *M. similis* sp. n. (Taiwan) and *M. thaii* sp. n., and *Lygistorrhina pentafida* sp. n. (Thailand), are described. Additional morphological and locality data (from Taiwan) for *M. yangi* L. PAPP and *L. chaoi* L. PAPP are given. With 21 figures.

Key words – Lygistorrhinidae, *Lygistorrhina*, *Matileola*, new taxa, Oriental region

INTRODUCTION

Lygistorrhinidae is a small family of the Sciaroidea (Mycetophiloidea). BECHEV (2000) listed only two genera and 21 species world-wide (only two species from the Oriental region). GRIMALDI & BLAGODEROV's (2001) corroborated the generic status of four genera and described a fifth one.

My paper on *Matileola* from Taiwan (PAPP 2002) had already been submitted when I managed to get a copy of GRIMALDI & BLAGODEROV's (2001) paper with the description of *Loyugesia* from Vietnam. Although both *Matileola* and *Loyugesia* were described in comparison to *Seguyola* MATILE, I did not change my manuscript, since the two new forms were so characteristically different judged even by their habitus only. However, below I would like to give some information on the genitalia of the three *Matileola* species, as compared to those of the other genera.

The structure of the male genitalia in Lygistorrhinidae is surprisingly uniform. Even such details, that tergite 9 has a basal process with "stalk" and annular apex, inner genitalia are small and hidden rather anteriorly in and between basal half of gonocoxites and tergite 9, and gonostylus almost always occurs with a medio-apical tooth. There is a pair of rather long and thin medial processes of gonocoxites, which play a role in suspension of genitalia. However, I think, we may try to use also features of the male genitalia if we publish high magnification figures on

genital parts in fixed position, e.g. in the broadest view of the apical half of gonostylus, as I did with Fig. 4.

One can, actually, find a number of strong synapomorphies in the male genitalia of the lygistorrhinid species. Based also on all the correct analytical studies, which GRIMALDI & BLAGODEROV's (2001) have published recently, monophyly of the group (family) is strongly corroborated. On the other hand, I do not think, that superficial comparisons, even if character states are treated by "cladistic" softwares, without capturing reliable data on the characters of the male genitalia of the Sciaroidea groups, would be authoritative as to the true evolutionary relationships of the family. For the time being, I think, an assumption that Lygistorrhinidae is a sister-group of the family Mycetophilidae s. str. is still a good starting point for further studies.

Together with the three species described below, eight species of three genera of Lygistorrhinidae are known from the Oriental region (*Loyugesia* 1, *Lygistorrhina* 4, *Matileola* 3). However, it seems premature to give estimation for the number of species in this region. Just in the Diptera Collection of the HNHM, there are two *Lygistorrhina* specimens (seriously damaged, abdomen lost) from Vietnam and Thailand, which must belong to two undescribed species, based on their wing pattern.

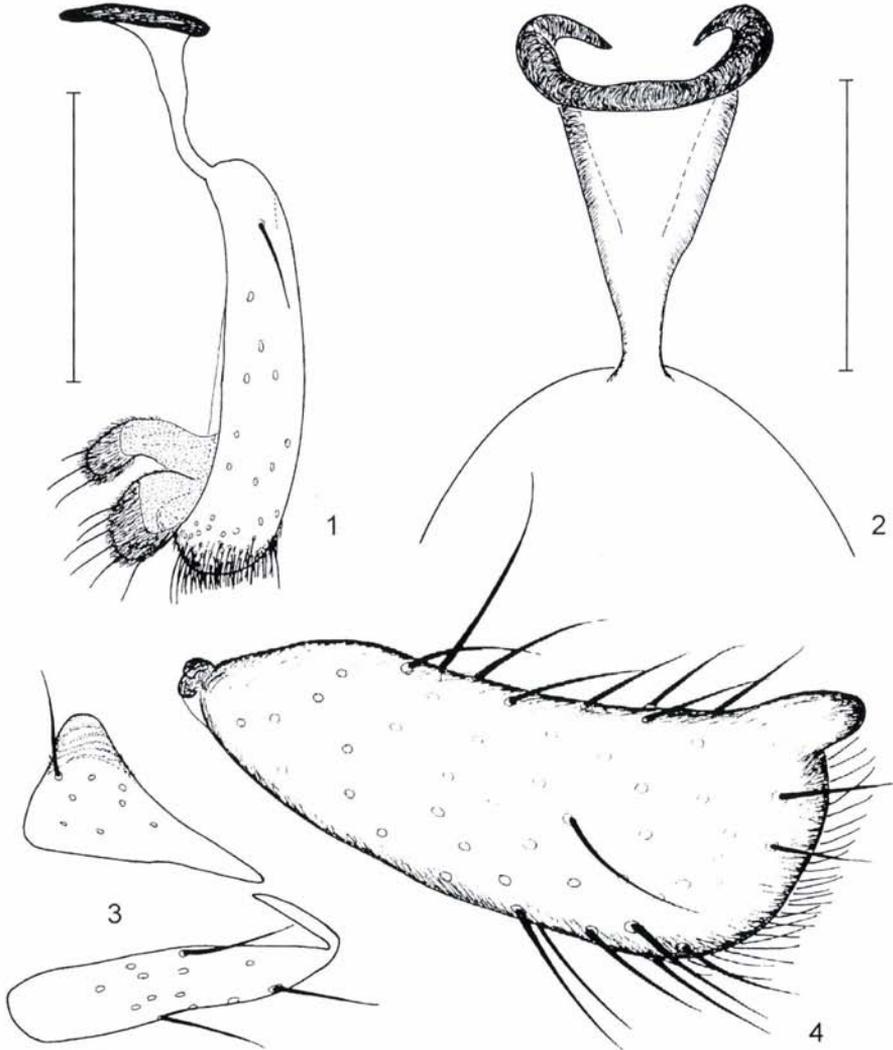
The specimens, including the types are preserved in the following institutions: Department of Zoology, Hungarian Natural History Museum, Budapest (HNHM), National Museum of Natural Science, Taichung (NMNS), and Taiwan Forestry Research Institute, Taipei (TFRI).

Lygistorrhina chaoi L. PAPP, 2002
(Figs 1–4)

Material examined – 6 males (HNHM, TFRI): Taiwan, Kaohsiung Hsien, Liukuei, Shan-Ping LTER Site, UV light traps, No. 14, 31.03–04.04. 2003, M. FÖLDVÁRI & L. PAPP; 2 males: TAIWAN: Ilan Hsien, Fu-Shan LTER Site, March 26, 2003, along /over a small river, No. 4, leg. L. PAPP.

Remarks – Formerly, only its holotype was known from Taiwan. The genitalia figures in the original description (PAPP 2002: Figs 2–3) are rather good, if one takes into consideration that those figures were made *in situ*, i.e. without preparing the holotype. Its gonostylus is really long with a medial apical tooth and without sub-basal long ventral seta, tergite 9 is with dense black setae apically, etc. Now abdomen of one of the newly collected males was prepared and postabdominal and genital parts are depicted in four figures.

Male tergite 8 (Fig. 3) with the usual dorsal process, sternite 8 with a reclinate narrow medial part. Male tergite 9 (Figs 1–2) scoop-like, its basal process forms 7/8 of a ring. Cerci and hypoproct short blunt and hairy, with a limited number of medium-long but not thick macrochaetae. Gonocoxites fused on a rather short section ventrobasally. Their medial process is very thin, long and thread-like. Gono-



Figs 1–4. *Lygistorrhina chaoi* L. PAPP, male, postabdomen and genitalia. 1 = tergite 9 and proctiger, lateral view, 2 = basal part of tergite 9, higher magnification, dorsal view, 3 = tergite 8 and sternite 8, lateral view (most of macrochaetae omitted), 4 = gonostylus, in view of the broadest extension of its apical part. Scales: 0.2 mm for Figs 1, 3, 0.1 mm for Figs 2, 4

stylus (Fig. 4) rather large, widening distad, its medio-apical tooth broad and rounded apically.

***Lygistorrhina pentafida* sp. n.**

Type material – Holotype female (HNHM): “Thailand, Tham Sakoen NP, No. 21, 29–31. 11. 2003, 19°23'N 100°38'E – Peregovits, Földvári, Kőrösi, Szappanos & Maklári-Kis.” A slightly damaged specimen, tip of right wing with tips of M fork broken off.

Description – Measurements in mm: length of head 0.22, length of thorax 0.66, length of head and thorax together 0.84, total body length 3.55, wing length 2.74, wing breadth 0.94, length of proboscis 1.68, length of palpus maxillaris ca. 1.28, length of fore tibia 1.045, length of fore metatarsus 1.43.

Frons and thorax dull dark, blackish brown, orbitalia, sides of mesonotum and prescutellar area grey dusted. Abdomen dark brown, tergites and sternites basally with narrow grey stripes, which slightly widen laterally.

Eyes with evenly distributed short hairs; also medial ocellus present but minute. Scape, pedicel and five basal flagellomeres yellow, 6th to 8th flagellomeres black, 9th and 10th flagellomeres yellow, 11th to 13th flagellomeres black again and apical (14th and 15th) flagellomeres yellow again.

Coxae dark, blackish, fore and mid femora dark grey, basal half of hind femur yellow, apical half dark brown. Tibiae darker dirty yellow, apical 1/5 of hind tibia blackish, fore and mid tarsi brown, hind tarsi dark brown, all tarsomeres yellow at both extreme tips. Tibial setulae in well-ordered rows. Tibial spurs 1:2:2, mid tibial spurs subequal. Fore claws 0.065 mm long, thin, sharp, curved arching with a ca. 0.03 mm long ventrobasal second apex.

Basal colour of wing rather light greyish brown. Costa and radial veins dirty yellow, other veins brown. Sc distinctly discernible, ends free. R_1 reaching to 1.45 mm from wing base, i.e. to middle of wing, R_5 joins costal vein far from apex of wing, costal vein distinct and abruptly ends at 3/4 of the section between R_5 and M_1 (0.47 mm from apex of R_5). M_1 - M_2 fork nearly complete, their stalk present as colourless fold only. M_{3+4} (cf. KRZEMIŃSKI & EVENHUIS 2000) distinct even below section of R_1 . Cu_1 almost reaching wing margin, apical part perpendicular to alar margin. Cu_2 straight, distinct almost to the curved part of Cu_1 . A_1 short but distinct, almost parallel to hind margin of wing, short, shorter than down-curved section of Cu_1 .

Wing patterned as follow: an about 0.33×0.22 mm brown spot at middle of *cu* cell; a longish curved spot around apical part of Cu_1 , almost joining central spot; a darker round spot below apex of R_5 , which continues in a central apical-subapical spot covering apical parts of M_{1-3} , forming a blunt five-branched spot together with the R_5 spot. Two small round windows in M_{1-2} fork and between M_2 and M_3 present.

Halter 0.44 mm long, greyish.

Female cerci liguliform, i.e. apex not pointed, longest hairs on cerci only 0.025 mm.

Male unknown.

Remarks – *Lygistorrhina pentafida* sp. n. is an easily recognizable species. It belongs to the species-group of the true *Lygistorrhina*, where flagellomeres are yellow-black patterned, namely *L. chaoi* L. PAPP, 2002 (Taiwan), *L. cincticornis* EDWARDS, 1926 (Borneo), *L. pictipennis* OKADA, 1937 (Japan), as well as *L. legrandi* MATILE, 1990 in the Afrotropical Region. The 6th to 8th and 11th to 13th

flagellomeres are black in this new species, which separates it from the related ones (cf. PAPP 2002). Also its wing and female cerci bear distinctive features.

Etymology – I name this new species after its five-branched darker wing pattern.

Matileola similis sp. n.

(Figs 5–10, 16)

Type material – Holotype male (HNHM): "TAIWAN: Taichung Hsien, Sinshe, 585m, N24°09'25.2" E120°52'9.6", No.24, over/along Ma-Chu-Ken river & in river valley, April 6, 2003, L. Papp & M. Földvári". Paratypes (HNHM, abdomen and genitalia of two males in plastic microvials, 2 males in TFRI, 2 males in NMNS): 17 males with the same data.

Three males with the same data were not designated as paratypes, since their abdomen is lost or damaged. An additional severely damaged specimen from the NMNS was not designated either as paratype with the following data: Taiwan, Kaoshiung Liukuei Shanping 4–6/IX/1989 K. W. Huang, Light trap – NMNS ENT 526–515 (identified as *M. similis* with a question-mark).

Description – Measurements in mm: length of head 0.265, length of thorax 0.65, length of head and thorax together 0.85, length of abdomen 3.025, total body length ca. 3.80 (holotype), body length of paratypes 2.72–3.72, wing length 2.42, 2.00–2.52 (paratypes), wing breadth 0.835, 0.635–0.85 (paratypes), length of proboscis 1.02, 0.825–1.04 (paratypes).

All body, including abdominal tergites dark, blackish brown.

Male frons linear, facettes comparatively large, round, microtrichia between minute but distinct. Two large lateral ocelli. Dorsal eye facettes not much bigger than ventral eye facettes. Intra-ocellar cilia comparatively long, 0.02 mm. Antenna all dark, ca. 0.55 mm long.

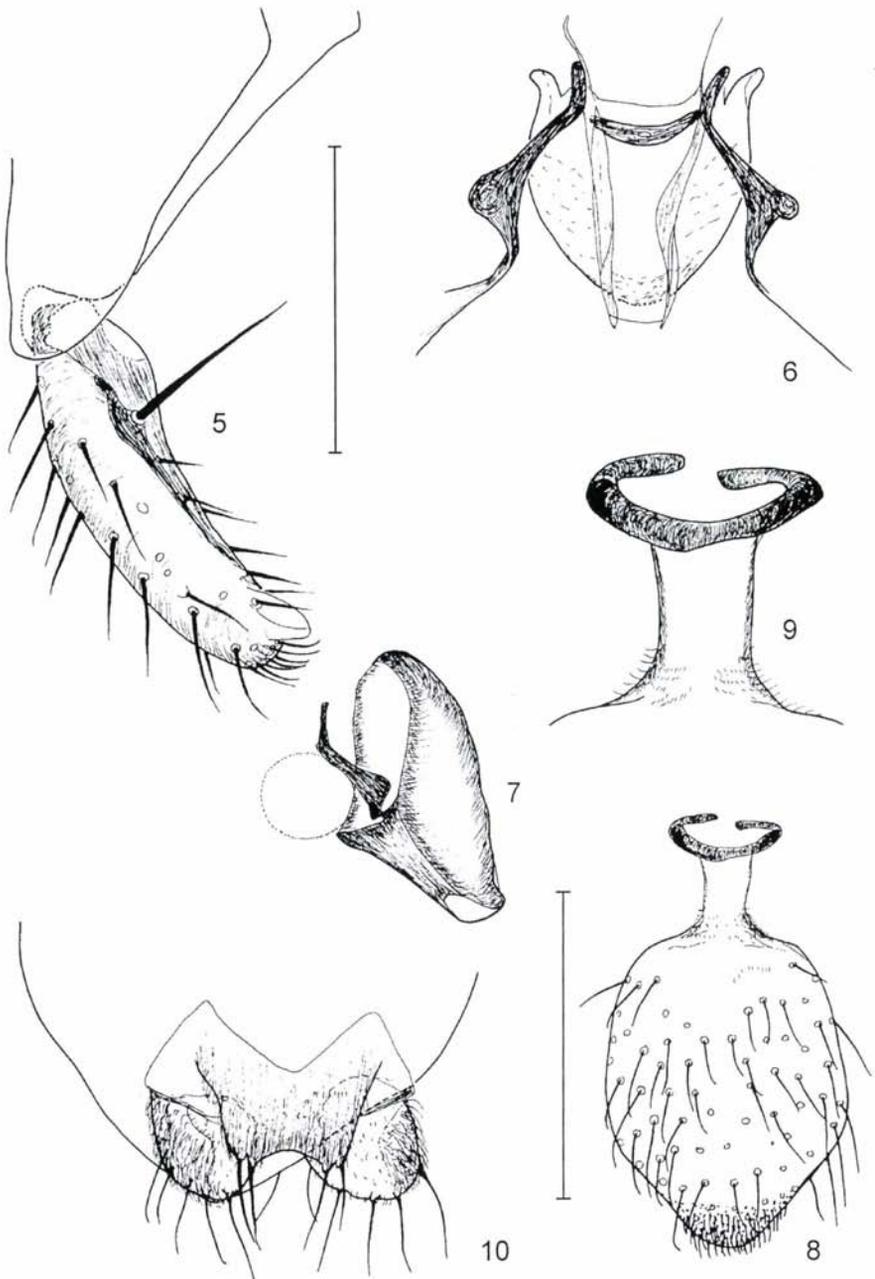
Mesonotal microtrichia short, a sagittal acrostichal and 2 dorsocentral rows seem to be distinct. Supra-alar and postalar setae of thorax are stronger. Scutellum short (ca. 0.08 mm long) with minute pale hairs.

Fore coxa dirty yellow, mid and hind coxae blackish. Fore and mid legs dirty yellow, tarsi darker (brown). All hind leg dark blackish brown, only base of hind femur indistinctly lighter. No stronger setae on legs, femoral and tibial microtrichia comparatively long and less numerous (e.g., both fore and mid tibiae with 8 rows only). Microtrichia are ordered in rows. Fore tibia 0.59 mm long, fore metatarsus 0.54 mm. Fore and mid tarsi are thin. No tibial spur on fore tibia, mid tibia with only 1 thin spur, which is only 0.065 mm long. Hind tibia baseball-bat shaped, length 1.34 mm, hind metatarsus 0.77 mm long, breadth 0.15 mm. Hind tibia with a 0.23 mm long medial and a 0.13 mm long lateral spur.

Wing greyish brown, not spotted, though radial region and narrow stripes along the other vein darker brown, the lighter band along M_1 broader and more contrasting to other darker parts of wing membrane, than in *M. yangi*. Costal and radial veins light brown, other veins ochre. Vein R_1 reaches 1.44 mm from wing base, i.e. 0.60 of wing length. Costal vein is rather thick from its conjointment with R_1 to its apex. Costa ends at 2/3 of distance of R_3 and M_1 . Cu_1 curved arched; Cu_2 straight, parallel to Cu_1 , and continued to the curve in Cu_1 . A_1 close to and nearly parallel with hind wing margin.

Halter dark (except for stalk basally), dark grey (blackish), length 0.56 mm (holotype).

Abdomen very thin and much longer than wing, tergites all dark. Tergite 8 (Fig. 16) somewhat shorter than that of *M. yangi*, with a large medio-caudal process. This process is more rounded and



Figs 5–10. *Matileola similis* sp. n., paratype male, postabdomen and genitalia. 5 = gonostylus, dorsal view, 6 = inner genitalia, dorsal view, 7 = gonocoxite with its medial process, caudal view, 8 = tergite 9, dorsal view, 9 = basal part of tergite 9, higher magnification, 10 = hypoproct and cerci, ventral (inner) view. Scales: 0.2 mm for Figs 7–8, 0.1 mm for Figs 5–6, 9–10

thicker than in *M. yangi* (its shape may be slightly different from that one on our figure, the process being half a cone, i.e. may be depressed at a different extent), but microtrichia are more sparse, particularly so on apex. Sternite 8 similar to that of *M. yangi*. Tergite 9 (Figs 8–9) similar to that of *M. yangi* but its macrosetae seem slightly shorter. The most anterior ring and its stalk are normally inside the T8+S8 space. Both cerci+proctiger and inner genitalia are hidden deep (rather anteriorly) under T9. Gonocoxites fused on a short section ventrobasally (as in Fig. 21); gonocoxites without any conspicuous armature, but with a narrow, twice angularly bent medial process (Fig. 7, only medial edge of gonocoxites depicted). Gonostylus (Fig. 5) not shorter than medial edge of gonocoxite, at its apical third ca. 1.5 times broader than basally, with widely rounded apex and with an apico-medial tooth as in *M. yangi*. Inner genitalia (Fig. 6) structurally similar to those of *M. yangi* (cf. Fig. 21), possibly lateral sclerites of aedeagus somewhat stronger.

Female unknown.

Remarks – *Matileola similis* sp. n. is a close relative of *M. yangi* L. PAPP. However, it is easily distinguishable from the latter species by its dark halter (that is yellow in *M. yangi*). The differentiating features the in male genitalia are small but definite. Microtrichia on abdominal tergite 8 are sparse, and even the shape of T8 is slightly different (Figs 15–16). The shape of gonostylus is different: the gonostylus of *M. similis* (Fig. 5) is longer than that of *M. yangi* (Fig. 20).

Matileola thaii sp. n.

(Figs 11–15)

Type material – “Holotype male (HNHM, damaged, fore legs and left hind leg lost): Thailand, Doi Phuka NP, No. 18, 26–27. 11. 2003 – UV light, leg. Peregovits, Földvári, Kőrösi, Szapponos & Maklári-Kis”. Paratype male (HNHM, left mid leg lost, thorax damaged, left wing prepared on a slide, right wing glued under the minuten pin; abdomen and genitalia in a plastic microvial): same data.

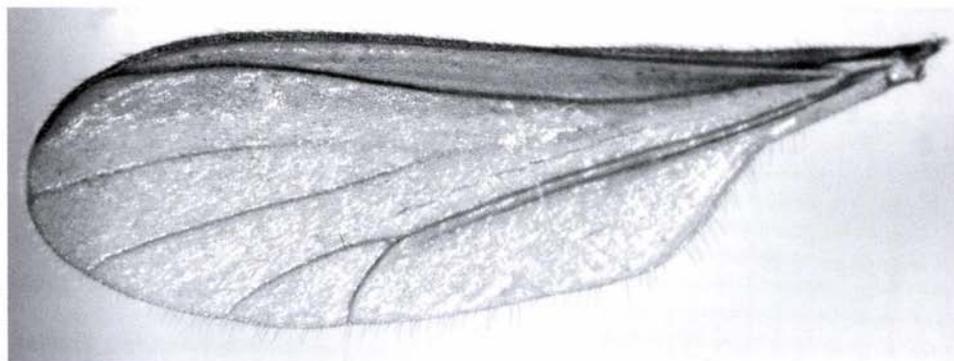


Fig. 11. *Matileola thaii* sp. n., paratype male, left wing dorsally

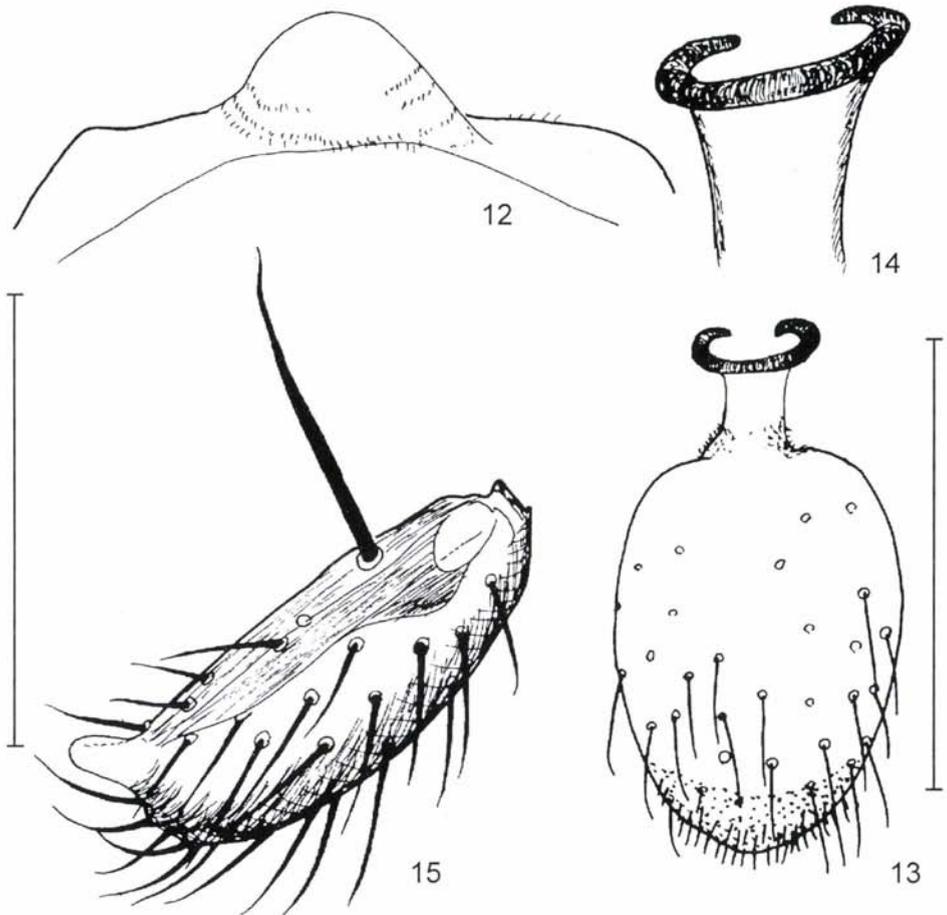
Description – Measurements in mm: length of head 0.27, length of thorax 0.41, length of head and thorax together 0.61, length of abdomen 2.25, total body length ca. 2.85 (holotype), body length of paratype ca. 2.9, wing length 2.42 (holotype), 2.37 (paratype), wing breadth 0.75, 0.76, length of proboscis 0.65 (holotype), length of palpus maxillaris 0.285.

All body, including abdominal tergites dark, no lighter area on thorax.

Male frons linear, facettes comparatively large, round, microtrichia between them distinct. Two large lateral ocelli. Antenna all dark, 0.37 mm long.

Thorax rather dull. Mesonotal microtrichia short: a sagittal acrostichal and 2 dorsocentral rows are distinct. Only supra-alar and postalar setae of thorax are stronger.

Legs all dark, incl. fore coxa. No stronger setae on legs but femoral and tibial microtrichia are comparatively long as in congeners. Microtrichia are ordered in more or less regular rows. Fore tibia



Figs 12–15. *Matileola thaii* sp. n., paratype male, postabdomen and genitalia. 12 = tergite 8, dorsal view, 13 = tergite 9, dorsal view, 14 = basal part of tergite 9, higher magnification, 15 = gonostylus, dorsal view. Scales: 0.1 mm Figs 12, 14–15, 0.2 mm for Fig. 13

0.53 mm long, fore metatarsus 0.515 mm. Fore and mid tarsi are thin. No tibial spur on fore tibia, but I do not see a spur either on mid tibia. Hind tibia baseball-bat shaped, length 1.12 mm, hind metatarsus 0.61 mm long, breadth 0.11 mm. Hind tibia with a 0.19 mm long medial and a 0.09 mm long lateral spur.

Wing (Fig. 11) uniformly brown, not spotted. Costal and radial veins light brown, other veins lighter brown. Vein R_1 reaches 0.99 mm from wing base, i.e. ends at 0.42 of wing length. Costal vein thick from its conjointment with R_1 to its apex. Costa ends at 13/19 of distance of R_5 and M_1 . R_5 widely S-shaped. M-Cu fork complete, Cu_1 joins base of R close to wing base. M_2 complete, i.e. well pigmented to the base of fork, M_1 nearly so; stalk of M fork is as faint as in the other two species. Cu_1 curved arched; Cu_2 straight, parallel to Cu_1 , and continued slightly distally to base of M-Cu₁ fork. A_1 faint and close to and parallel with hind wing margin.

Halter black, base of stalk lighter, length 0.53 mm (holotype).

Abdomen very thin and about as long as wing, tergites all dark. Tergite 9 (Figs 13–14) broad and slightly longer than gonocoxites; its basal part (Fig. 14) seems slightly shorter than that of the other two species. Tergite 8 (Fig. 12) with rather few microchaetae. Gonocoxites without any conspicuous armature. Gonostylus (Fig. 15) much shorter than gonocoxite, and conspicuously shorter than that of *M. similis* and *M. yangi*. Contrarily, its medial sub-basal megaseta stronger, and macrosetae less dense apically.

Female unknown.

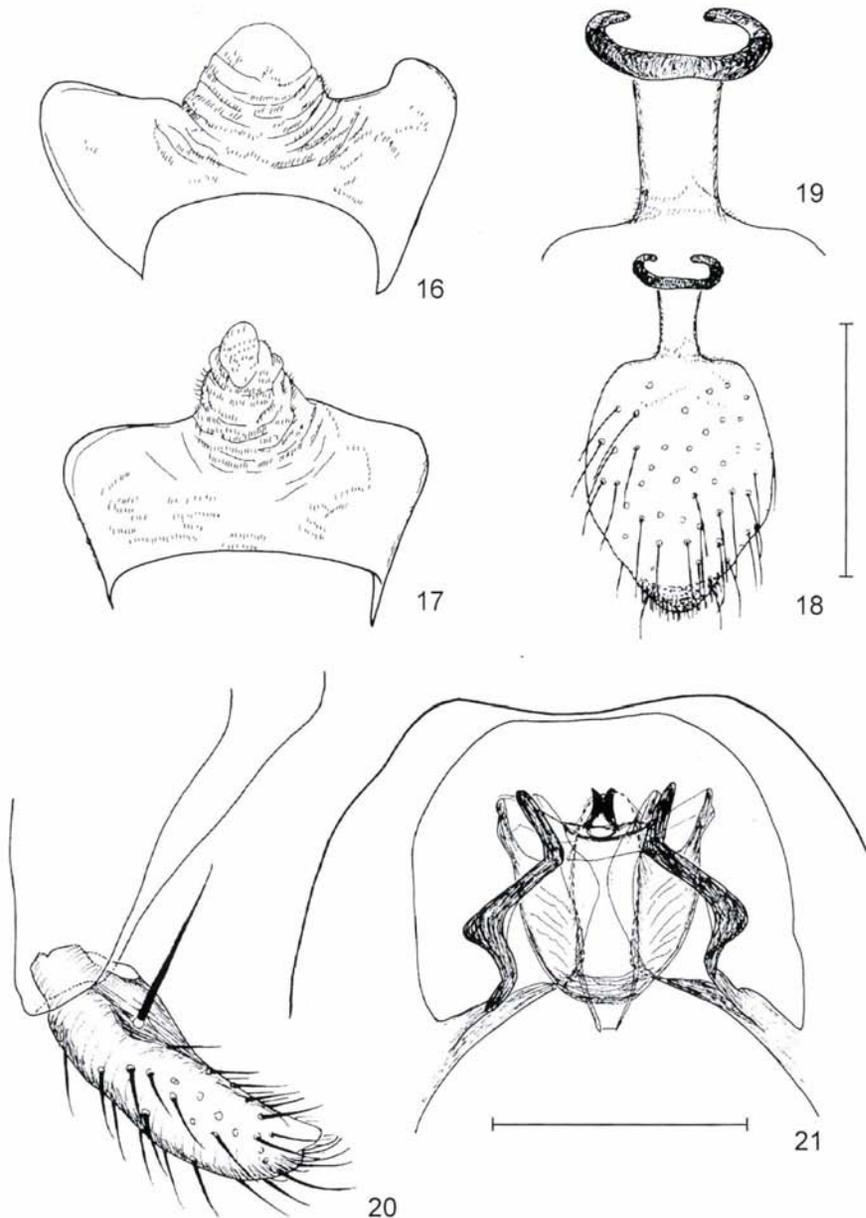
Remarks – *Matileola thaii* sp. n. is an easily recognisable species. As for its wing venation (Fig. 11), it seems to be the most primitive species of the known lygistorrhinids. That is, wing venation is less reduced than in any other species. Contrarily to the other two species, also its fore coxae are dark. Its male genitalia are of the same structure as of the other two species, but there are distinct and well-discernible differences. Its gonostylus (Fig. 15) is definitely shorter and the sub-basal megaseta on gonostylus is stronger than in the other two species. There are much less microchaetae on tergite 8 (Fig. 12), than on that of the other two species (Figs 16–17).

We may note, that by discovery of this species, *Matileola* L. PAPP has lost its status as being a genus “endemic for Taiwan”.

Matileola yangi L. PAPP, 2002
(Figs 17–21)

Material examined – 6 males (HNHM, 2 males in TFRD): TAIWAN: Taipei Hsien, Pinling, 319 m, No. 27, over/along Jinggua-liao river, April 17, 2003, leg. L. PAPP; 1 male: *ibid.*, Han-Lo-Dé, 450 m, No. 12, forest undergrowth, March 29–30, 2003; 1 male: *ibid.*, Han-Lo-Dé, 450 m, No. 26, in forest of a gorge, April 13, 2003.

Additional characters – This species was described on the basis of a single male, whose genitalia were not prepared while described. Now abdomen of two males were prepared and genital parts depicted.



Figs 16–21. *Matileola* spp., males, postabdominal and genital parts. 16–17 = tergite 8, dorsal view: 16 = *M. similis* sp. n., 17 = *M. yangi* L. PAPP; 18–21 = *M. yangi* L. PAPP: 18 = tergite 9, dorsal view, 19 = basal part of tergite 9, higher magnification, 20 = gonostylus, dorsal view, 21 = basal part of gonocoxites and inner genitalia, dorsal view (T9 and proctiger removed). Scales: 0.1 mm for Figs 16–17, 19–21, 0.2 mm for Fig. 18

Abdomen very thin and much longer than wing, tergites all dark. Tergite 8 (Fig. 17) comparatively long with a large medio-caudal process. This process may be slightly different from that one on our figure (the process is half of a cone, i.e. may be depressed at a different extent), but microtrichia cover all part, in contrast to *M. similis*. Sternite 8 as in *M. similis*. Tergite 9 (Figs 18–19) broad and slightly longer than gonocoxites, its macrosetae slightly longer, than in *M. similis*. Gonostylus (Fig. 20) shorter than gonocoxite, its apical tooth comparatively short, broad and rounded. Gonocoxites without any conspicuous armature, but with a twice, angularly bent narrow medial process (Fig. 21). The pair of medial processes (placed most dorsal under T9), and ventral wall of gonocoxites form a “tunnel”, in which aedeagal complex moves forward and backward along the body axis. Aedeagus mostly membranous and protected by a scutiform “shield” (I would rather not decide on its morphological – homology – status). Aedeagal apodeme small, joins ventral wall of the “shield”.

Female is still unknown.

*

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