

Three new species of *Lindneromyia* from Laos
(Diptera: Platypezidae)

SHAOLIN HAN AND DING YANG

Department of Entomology, College of Plant Protection, China Agricultural University,
Beijing 100193, China.

Email: PhoebeHan1993@126.com (SLH); dyangcau@126.com, dyangcau@aliyun.com (DY).
(DY=correspondence author)

ABSTRACT

Only one species of the genus *Lindneromyia* Kessel, *Lindneromyia argyrogyna* (de Meijere), was known to occur in Laos. Here the following three new species are added to the fauna of Laos: *Lindneromyia laosensis* sp. nov., *L. longa* sp. nov. and *L. obtusa* sp. nov. A key to the species of *Lindneromyia* from Laos is presented.

Keys words: Diptera, Platypezidae, *Lindneromyia*, Laos, new species.

INTRODUCTION

The genus *Lindneromyia* Kessel, 1965 belongs to the subfamily Platypezinae. It contains more than 30 species, which are mainly distributed in the Afrotropical, Palearctic, Oriental and Australasian Region (Bowden 1973, Chandler 1994, Chandler 2001, Kessel 1965). Among them, eight species are known from the Oriental region, of which one species, *L. argyrogyna*, is also known to occur in the Australasian and Palearctic Region (Brunetti 1920, Chandler 1994, Esaki 1932, Kessel & Clopton 1969, Oldenberg 1913, Shatalkin 1985).

Laos is located in northern Indo-China Peninsula, which belongs to the Oriental Region and has a tropical and subtropical monsoon climate. Only one species of the genus *Lindneromyia*, *L. argyrogyna*, was previously known to occur in Laos (Chandler 1994). In this paper, three new species of *Lindneromyia* are described from Laos, and *L. argyrogyna* is reported from another different district of Laos. A key to the species of *Lindneromyia* from Laos is presented.

MATERIALS AND METHODS

The specimens were studied and illustrated with ZEISS Stemi 2000-C, LEIKAN DM 2500 and

Canon 5D. Genitalic preparations were made by macerating the apical portion of the abdomen in 70°C water for less than 30 min, after examination it was transferred to fresh glycerine and stored in a microvial pinned below the specimen. The specimens examined were deposited in the Entomological Museum of China Agricultural University (CAU), Beijing.

TAXONOMY

Genus *Lindneromyia* Kessel

Lindneromyia Kessel, 1965a: 1. Type species: *Lindneromyia africana* Kessel, 1965.
Symmetricella Kessel, 1965b: 325. Type species: *Symmetricella fumapex* Kessel, 1965.
Plesioclythia Kessel and Maggioncalda, 1968: 58. Type species: *Platypeza agarici* Willard, 1914.
Penesymmeetria Kessel and Maggioncalda, 1968: 63. Type species: *Platypeza umbrosa* Snow, 1894.

Diagnosis — Male. Predominantly black with some grey, brown or silver dusting. A uniseriate acrostichal bristles present. Mid tibia with both antero-ventral and postero-ventral apical spurs. Hind tarsus with segments 1-3 broad, 2 shorter than

broad, 3 usually at least as long as 1 (or longer). Both crossveins r-m and dm-cu present. Crossvein dm-cu more than its length to much less than its length from margin (Chandler 1994).

Female. Frons and thorax grey dusted, with more or less distinct brown markings (or more or less strongly silver dusted in several species from Oriental and Australasian Regions). Cell c may be less symmetrical than in male of same species (Chandler 1994).

Key to species of *Linderomyia* from Laos

- 1 Costa weakly concaved before tip of Sc; first costal section shorter than second costal section (Figs. 2, 10, 30) 2
— Costa weakly convexd before tip of Sc; first costal section distinctly longer than second costal section (Fig. 22) ***L. longa* sp. nov.**
- 2 Hind tarsus strongly flattened with tarsomere 2 wider than long; M_2 distinct; hypandrial lobe with a double curve near apex (Figs. 6, 14) . . . 3
— Hind tarsus weakly flattened with tarsomere 2 as long as wide; M_2 short; hypandrial lobe round and obtuse near apex (Fig. 34)
. ***L. obtusa* sp. nov.**
- 3 M_1 without stump vein; hypandrial lobe slender (Fig. 14) ***L. laosensis* sp. nov.**
— M_1 with stump vein on anterior face; hypandrial lobe stronger (Fig. 6) ***L. argyrogyna***

1. *Lindneromyia argyrogyna* (de Meijere) (Figs. 1–8)

Platypeza argyrogyna de Meijere, 1907: 257. Type locality: Java, Semarang.

Clythia argyrogyna (de Meijere, 1907). —Oldenberg, 1913: 341.

Plesioclythia argyrogyna (de Meijere, 1907). —Kessel and Clopton, 1969: 56.

Lindneromyia argyrogyna (de Meijere, 1907). —Chandler, 1989: 142.

Diagnosis — M_1 with stump vein on anterior face. Male hind tarsus strongly flattened with tarsomere 2 distinctly wider than long. M_2 relatively long. Crossvein dm-cu slightly less than length from

wing margin.

Description — Male (Fig. 1). Body length 2.80-3.00 mm, wing length 2.60-2.80 mm.

Head dull dark brown. Hairs and bristles black. Antenna dark brown. First flagellomere nearly semicircular, slightly wider than long; arista with first segment slightly shorter than second segment. Proboscis brown; hairs blackish. Palpus dark brown, but apically brownish yellow.

Thorax dark brown except scutum and scutellum dull dark brown. Hairs and bristles black. Three strong notopleural bristles, 2 scutellar bristles. Legs brown, but trochanters brownish, femora and tibiae dark brown, tarsi yellow except fore tarsus brownish yellow. Hind tarsus (Fig. 3) strongly flattened; tarsomere 1 as long as tarsomere 3 dorsally, about 4/5 as long as tarsomere 3 ventrally; tarsomere 2 distinctly wider than long, about half as long as tarsomere 3. Wing (Fig. 2) hyaline; C slightly concaved before tip of Sc; first costal section distinctly shorter than second costal section; petiole of M_1 and M_2 very long, median fork arising distinctly closer to wing margin than to crossvein dm-cu; M_2 very short; crossvein dm-cu less than length from wing margin. Cell c asymmetrical, 0.77 cell sc on costa. Crossvein r-m at 0.64 length of cell c. Median fork 0.78 distance from dm-cu to wing margin. Crossvein dm-cu about 0.63 as its length from wing margin. Halter dark brown except base brownish yellow.

Abdomen (Fig. 4) dark brown except posterior margins of tergites 3-5 slightly darker. Hairs and bristles black.

Male genitalia (Figs. 6–8): Epandrium yellowish brown, almost bare, relatively broad in lateral view. Surstylus like swan head, with 2 long bristles and 1 short bristle. Hypoproct cuspidal, with three distinct bristles. Cercus broad and round at end, with tiny hairs. Hypandrium yellowish brown, bare; hypandrial lobe a bit stronger, with a double curve near apex straight down, with 2 short bristles near processes. Phallus slim, extending to tip of hypandrial lobe.

Female. Unknown.

Material examined — 2 males, Laos, Phon Khao National Biodiversity, 160 m, 29.VI.2015, Wenliang Li (CAU).

Distribution — Nepal, India, Sri Lanka,

Laos, Vietnam, China (Hong Kong, Taiwan), Philippines, Malaysia, Indonesia, Papua New Guinea, Australia (Chandler 1994), Singapore (Oldenberg 1913), Japan (Honshu) (Esaki 1932), the Bismarck Islands (New Ireland) and the Ryukyu Islands (Okinawa) (Kessel & Clopton 1969), the eastern parts of Russia (Primorye district) (Shatalkin 1985), the Indian states of Uttar Pradesh and Karnataka (Brunetti 1920).

Remarks — *L. argyrogyna* was once recorded from Muong Sing, Laos.

2. *Lindneromyia laosensis* sp. nov.

Figs. 9–20

urn:lsid:zoobank.org:act:D7DA9E5C-2753-49C7-A362-87A7049D5910

Diagnosis — Crossvein dm-cu far from wing margin, less than length from wing margin. M_2 moderately long. Male hind tarsus strongly flattened with tarsomere 2 distinctly wider than long. Female hind tarsus brown except tarsomeres 1-2 dark yellow.

Description — Male (Fig. 9). Body length 2.65 mm, wing length 2.65 mm.

Head dull dark brown. Hairs and bristles black. Eyes dark brown except dorsal 3/5 enlarged and dark red. Hairs and bristles on head black. Antenna brown except 2 basal segments dark brown. First flagellomere nearly semicircular, slightly wider than long; arista with first segment slightly shorter than second segment. Proboscis dark yellow with black hairs. Palpus dark brown except apical half brownish yellow.

Thorax dark brown except scutum dull dark brown. Hairs and bristles black. Three strong notopleural bristles, 3 scutellar bristles. Legs dark brown, but trochanters brownish and tarsi yellow or dark yellow except tarsomere 5 brown or brownish. Hairs and bristles on legs black. Hind tarsus (Fig. 11) strongly flattened; tarsomeres 1 and 3 subequal dorsally, tarsomere 2 distinctly wider than long, tarsomere 3 about 1.2× tarsomere 1 ventrally. Wing (Fig. 10) hyaline. \cup C slightly concaved before tip of Sc. First costal section much shorter than second costal section. Petiole of M_1 and M_2 long, median fork arising distinctly closer to margin than to crossvein dm-cu; M_2 moderated long; crossvein dm-

cu far from wing margin, less than length from wing margin. Cell c asymmetrical, 1.7× cell sc on costa. Crossvein r-m at 0.64 length of cell c. Median fork 0.74 distance from dm-cu to margin. Crossvein dm-cu about 0.7 as its length from margin. Halter dark brown except basal portion brownish.

Abdomen (Fig. 12) dark brown except posterior margins of tergites 3-5 darker. Hairs and bristles black.

Male genitalia (Figs. 14–16): Epandrium yellowish brown, almost bare, relatively broad in lateral view. Surstylus footprint-shaped, with four weak bristles, and with hairs around top. Hypoproct knife-shaped, with five long bristles each side. Cercus shorter than hypoproct, with tiny hairs. Hypandrium yellowish, bare; hypandrial lobe rather slender, with a double curve near apex pointing sideways and downwards. Phallus quite slim, extending to tip of hypandrial lobe.

Female (Fig. 17). Body length 2.55-2.95 mm, wing length 2.45-2.5 mm. Tarsi brownish yellow except hind tarsomeres 1-2 dark yellow, tarsomeres 3-4 dark brown, tarsomere 5 brownish yellow; tarsomeres 1, 3, and 4 subequal dorsally, tarsomere 2 about 0.7 as long as wide, tarsomere 3 about 1.5 as its dorsal length ventrally.

Material examined — Holotype male, paratypes 4 females, Laos, Nam Kading National Biodiversity, 171 m, 30.VI.2015, Wenliang Li (CAU).

Distribution — Laos.

Remarks — This new species is similar to *Lindneromyia argyrogyna* de Meijere (1907) in the shape of the hind tarsus and the hypandrial lobe with a double curve near the end. But it can be separated from the latter by M_1 without stump vein, the hypandrial lobe rather slender and the double curve pointing sideways and downwards. In *L. argyrogyna*, M_1 has a short appendage, the hypandrial lobe is much stronger and the double curve is pointing straight down (Chandler 1994).

Etymology — The species is named after the type locality Laos.

3. *Lindneromyia longa* sp. nov.

Figs. 21–28

urn:lsid:zoobank.org:act:F051FCED-20E4-46DB-B6B3-5EADF4511285

Diagnosis — Proboscis and palpus dark yellow. Male hind tarsus strongly flattened with tarsomere 2 distinctly wider than long. First costal section distinctly longer than second costal section. M_2 relatively long. Crossvein dm-cu distinctly far from wing margin, slightly less than length from wing margin.

Description — Male (Fig. 21). Body length 3.30 mm, wing length 2.80 mm.

Head dull dark brown. Hairs and bristles black. Antenna brown except third segment and base of arista brownish. First flagellomere nearly semicircular, slightly wider than long; arista with first segment slightly shorter than second segment. Proboscis dark yellow with blackish hairs. Palpus dark yellow.

Thorax dark brown except scutum and scutellum dull dark brown. Hairs and bristles black. Three strong notopleural bristles, 2 scutellar bristles. Legs dark yellow, except fore and mid femora brown, hind femur and tibia dark brown, and tarsomere 5 brown. Hind tarsus (Fig. 23) strongly flattened; tarsomere 1 subequal to tarsomere 3; tarsomere 2 distinctly wider than long, about 3/5 as long as tarsomere 1 dorsally, about half as long as tarsomere 1 ventrally. Wing (Fig. 22) hyaline except cell sc tinged yellow; C slightly convex before tip of Sc; first costal section distinctly longer than second costal section; petiole of M_1 and M_2 long, median fork arising distinctly closer to margin than to crossvein dm-cu; M_2 relatively long; crossvein dm-cu distinctly far from wing margin, slightly less than length from wing margin. Cell c almost symmetrical, $1.58 \times$ cell sc on costa. Crossvein r-m near middle of cell c. Median fork 0.67 distance from dm-cu to wing margin. Crossvein dm-cu about 4/5 as its length from wing margin. Halter dark brown except base brownish yellow.

Abdomen (Fig. 24) dark brown. Hairs and bristles black.

Male genitalia (Figs. 26–28): Epanthrium yellowish brown, with several bristles, relatively broad in lateral view. Surstylus cleaved as a small

cuspid, with some bristles and long hairs especially on top. Hypoproct triangular, with long bristles on each side. Cercus more obtuse, with few small bristles and tiny hairs. Hypandrium yellowish brown, bare; hypandrial lobe much more stronger, round, with several small weak bristles. Phallus cuspidal.

Female. Unknown.

Material examined — Holotype male, Laos, Phon Khao National Biodiversity, 208 m, 29.VI.2015, Wenliang Li (CAU).

Distribution — Laos.

Remarks — This new species is very similar to *Lindneromyia argentifascia* Chandler, 1994 from Australia in the shape of the hypandrial lobe round in lateral view, bearing several small bristles and cell c almost symmetrical. But it can be separated from the latter by M_2 incomplete and crossvein dm-cu a little bit shorter than (or even subequal to) the length from margin. In *L. argentifascia*, M_2 reaches the margin and Crossvein dm-cu is much longer than the length from margin (Chandler 1994).

Etymology — The species is named for the long cell c.

4. *Lindneromyia obtusa* sp. nov.

Figs. 29–36

urn:lsid:zoobank.org:act:B95C6C9B-F8E1-444C-9E32-635655356EB1

Diagnosis — Body somewhat slender. Crossvein dm-cu equal to length from wing margin. M_2 very short. Male hind tarsus weakly flattened with tarsomere 2 nearly as long as wide.

Description — Male (Fig. 29). Body length 2.00 mm, wing length 1.90 mm.

Head dull brown. Hairs and bristles black. Antenna dark brown except third segment and base of arista brownish. First flagellomere nearly semicircular, slightly wider than long; arista with first segment slightly shorter than second segment. Proboscis brown with blackish hairs. Palpus dark brown except apical half brownish yellow.

Thorax dark brown except scutum and scutellum dull brown. Hairs and bristles black. Three strong notopleural bristles, 2 scutellar bristles. Legs brown, but trochanters brownish, hind femur and tibia dark brown, and all tarsi brownish yellow except hind tarsus dark brownish

yellow. Hind tarsus (Fig. 31) flattened, a little wider than hind tibia; tarsomere 1 about $5/3$ as long as tarsomere 2, 2 about $3/4$ as long as 3 dorsally, 3 nearly as long as tarsomere 1 ventrally. Wing (Fig. 30) hyaline; C slightly concaved before tip of Sc; first costal section much shorter than second costal section; petiole of M_1 and M_2 very long, median fork arising distinctly closer to wing margin than to crossvein dm-cu; M_2 very short; crossvein dm-cu equal to length from wing margin. Cell c asymmetrical, $0.69\times$ cell sc on costa. Crossvein r-m at 0.72 length of cell c. Median fork 0.75 distance from dm-cu to margin. Crossvein dm-cu about 0.79 as its length from margin. Halter dark brown except base brownish yellow.

Abdomen (Fig. 32) dark brown except posterior margins of tergites 2-5 darker. Hairs and bristles black.

Male genitalia (Figs. 34–36): Epandrium yellowish brown, with few bristles, broad in lateral view. Surstylus straight up, with several bristles and hairs around tip. Hypoproct slim, hanging down, with 2 bristles. Cercus broad, running along hypoproct, with tiny hairs. Hypandrium yellowish, bare; hypandrial lobe sort of short, obtuse, with several short bristles around end. Phallus much more stronger, extending straight down.

Female. Unknown.

Material examined — Holotype male, Laos, Nam Kading National Biodiversity, 171 m, 30.VI.2015, Wenliang Li (CAU).

Distribution — Laos.

Remarks — This new species is somewhat similar to *Lindneromyia brunettii* Kessel & Clopton (1969) in the venation of the wing and hypandrium relatively narrow in lateral view, extending straight forward. But it can be separated from the latter by the shape of tarsomeres 4 and 5, the antenna dark brown except the third segment and the hypandrial lobe obtuse. In *L. brunettii*, tarsomere 4 is more pointed at apex while tarsomere 5 is more pointed at beginning, the antenna is brownish yellow, and the hypandrial lobe has a cusp terminally (Kessel & Clopton 1969; Chandler 1994).

Etymology — The species is named for the obtuse hypandrial lobe.

ACKNOWLEDGEMENTS

We are grateful to Dr. Wenliang Li (Luoyang) for collecting the specimens. Author Shaolin Han expresses her sincere thanks to Dr. Peter J. Chandler for providing the old publications. The research was supported by the Ministry of Science and Technology of the People's Republic of China (2005DKA21402).

REFERENCES

- Bowden J (1973) Two new species of Platypezidae from Kenya (Diptera). *Journal of the Entomological Society of Southern Africa*, 36: 159–64.
- Brunetti E (1920) The Fauna of British India, including Ceylon and Burma. Diptera Brachycera. Vol. 1. Taylor & Francis: London. ix + 401 pp., 4 pls.
- Chandler PJ (1989) Family Platypezidae. In: Evenhuis NL (Ed.). Catalog of the Diptera of the Australasian and Oceanian Regions. pp. 420–421. *Bishop Museum Special Publication* No. 86. Bishop Museum Press: Honolulu; E. J. Brill: Leiden. 1155 pp.
- Chandler PJ (1994) The Oriental and Australasian species of Platypezidae (Diptera). *Invertebrate Taxonomy*, 8(2): 351–434.
- Chandler PJ (2001) The flat-footed flies (Diptera: Opetiidae and Platypezidae) of Europe. *Fauna Entomologica Scandinavica*, 36: 1–276.
- Esaki T (1932) Iconographia Insectorum Japonicorum. Hokoryukan: Tokyo. 2241 pp.
- Kessel EL (1965a) *Lindneromyia*, a new genus of flat-footed flies, and the descriptions of two new species of Platypezidae from Africa (Diptera). *Stuttgarter Beiträge zur Naturkunde*, 143: 1–6.
- Kessel EL (1965b) *Symmetricella*, a new genus of Platypezidae from Peru (Diptera). *Wasmann Journal of Biology*, 23: 235–239.
- Kessel EL, and Clopton JR (1969) The Platypezidae of the Oriental Zoogeographic Region and islands to the east, with descriptions of four new species (Diptera). *Wasmann Journal of Biology*, 27: 25–73.

- Kessel EL, and Maggioncalda EA (1968) A revision of the genera of Platypezidae with the descriptions of five new genera and consideration of phylogeny, circumversion and hypopygia (Diptera). *Wasmann Journal of Biology*, 26: 33–106.
- Meijere JCH de (1907) Studien über Südostasiatische Dipteren. I. *Tijdschrift voor Entomologie*, 50: 196-264.
- Oldenberg L (1913) H. Sauter's Formosa-Ausbeute. Familie Clythiidae (=Platypezidae) (Dipt.). *Annales Musei Nationalis Hungarici*, 11: 339–343.
- Shatalkin A (1985) A review of the fauna of fungus flies (Diptera, Platypezidae) of the U.S.S.R.. *Archives of Zoological Museum of Moscow State University*, 23: 69–136.
- Snow WA (1894) American Platypezidae. *Kansas University Quarterly*, 3: 143–152.
- Wallard F (1914) Two new species of *Platypeza* found at Stanford University. *Psyche*, 21: 167–168.



1

Figure 1. *Lindneromyia argyrogyna* (de Meijere) (male). Habitus, lateral view.



Figure 2–5. *Lindneromyia argyrogyna* (de Meijere) (male). 2. wing; 3. hind tarsus, posterior view; 4. abdomen, dorsal view; 5. hind leg, posterior view.

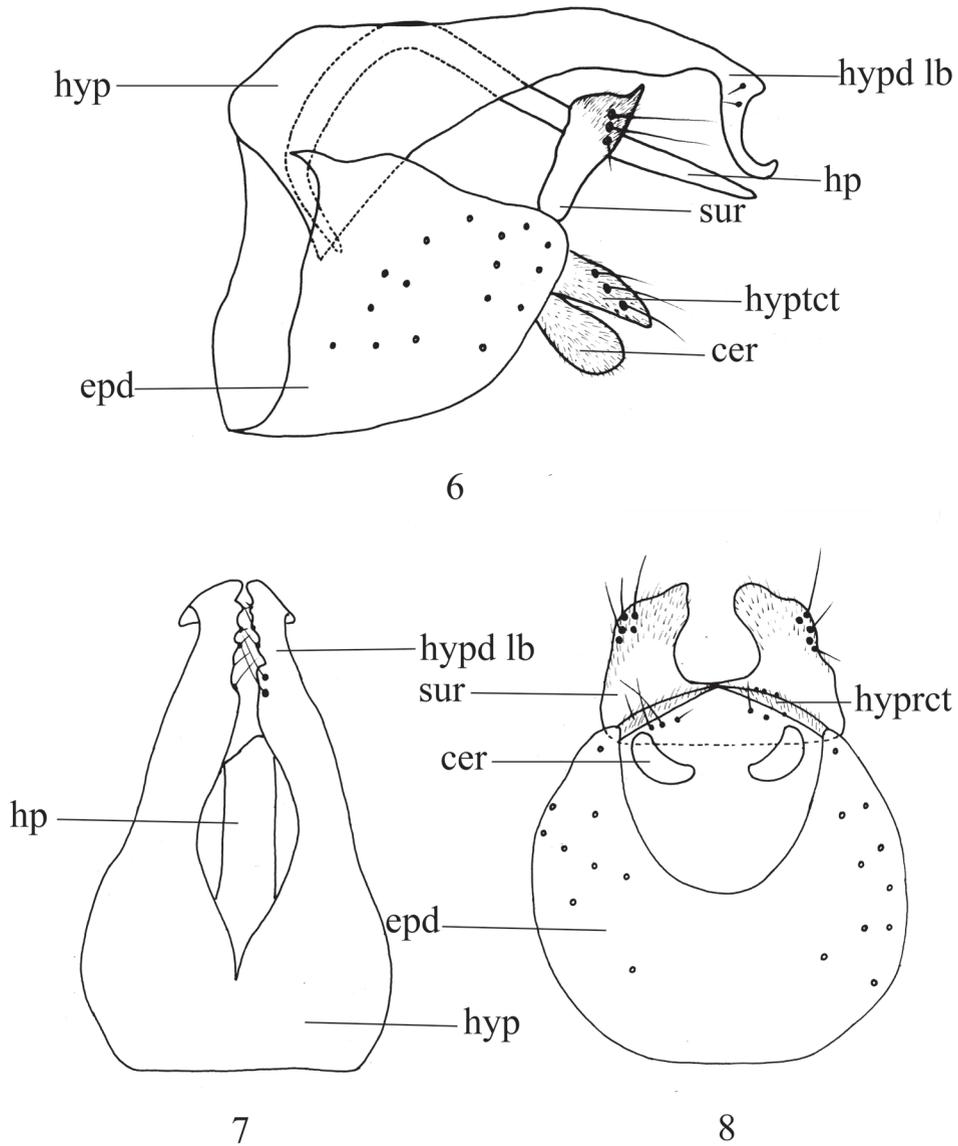
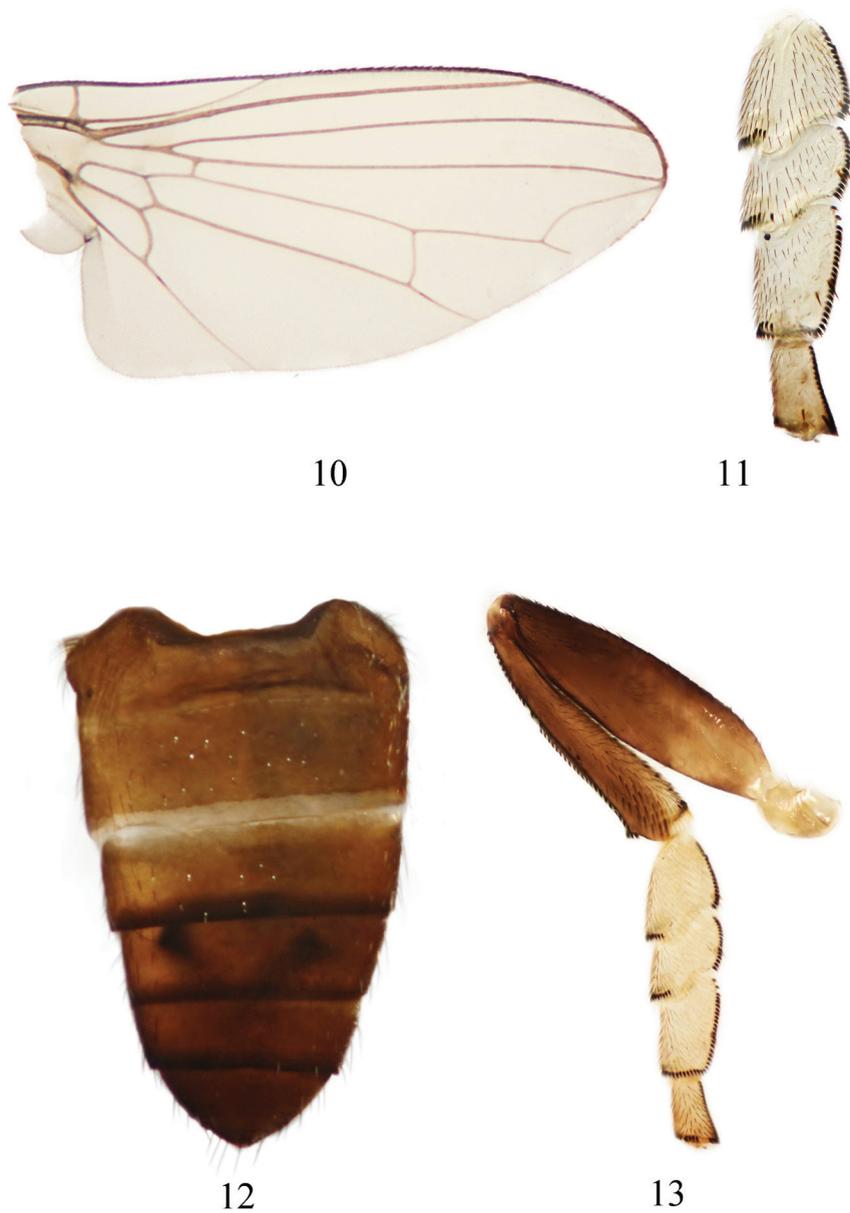


Figure 6–8. *Lindneromyia argyrogya* (de Meijere) (male). **6.** Male genitalia, lateral view; **7.** Hypandrium and aedeagus, ventral view; **8.** Male genitalia, posterior view. Abbreviations: cer = cercus; epd = epandrium; hyp = hypandrium; hypd lb = hypandrial lobe; hyprt = hypoproct; ph = phallus; sur = surstylus.

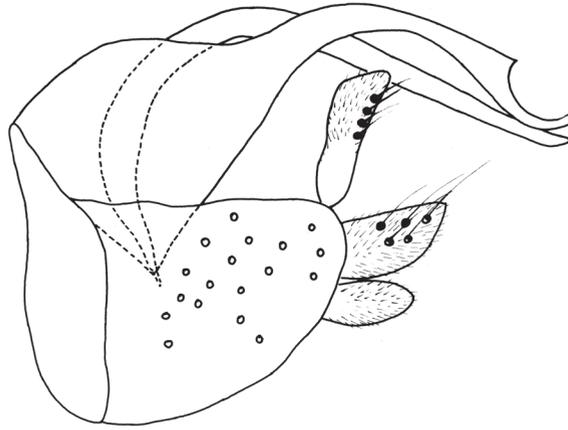


17

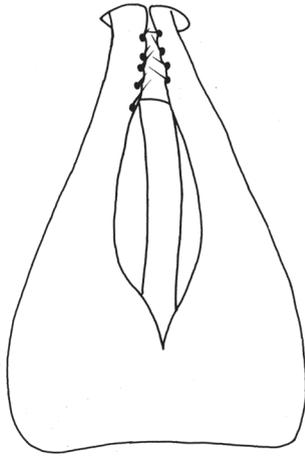
Figure. 9. *Lindneromyia laosensis* sp. nov. (male). Habitus, lateral view.



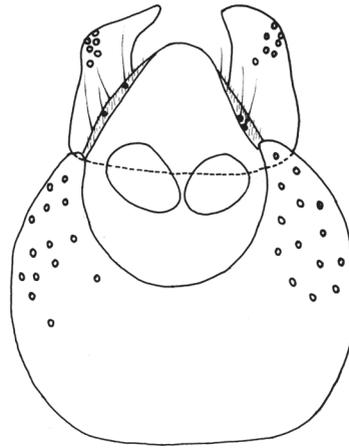
Figures 10–13. *Lindneromyia laosensis* sp. nov. (male). 10. wing; 11. hind tarsus, posterior view; 12. abdomen, dorsal view; 13. hind leg, posterior view.



14



15



16

Figures 14–16. *Lindneromyia laosensis* sp. nov. (male). 14. Male genitalia, lateral view; 15. Hypandrium and aedeagus, ventral view; 16. Male genitalia, posterior view.



17

Figure. 17. *Lindneromyia laosensis* sp. nov. (female). Habitus, lateral view.



18



19



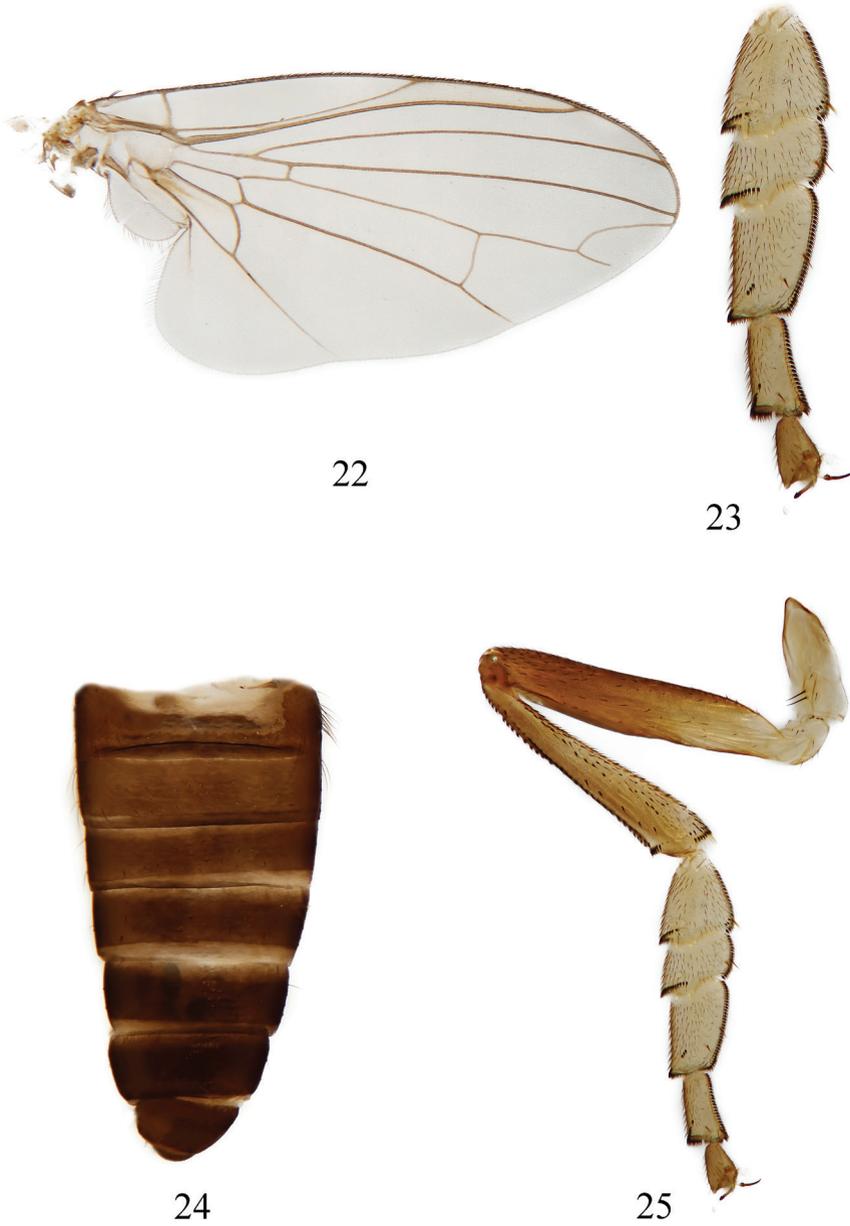
20

Figures 18-20. *Lindneromyia laosensis* sp. nov. (female). 18. hind tarsus, anterior view; 19. abdomen, dorsal view; 20. hind leg, anterior view.

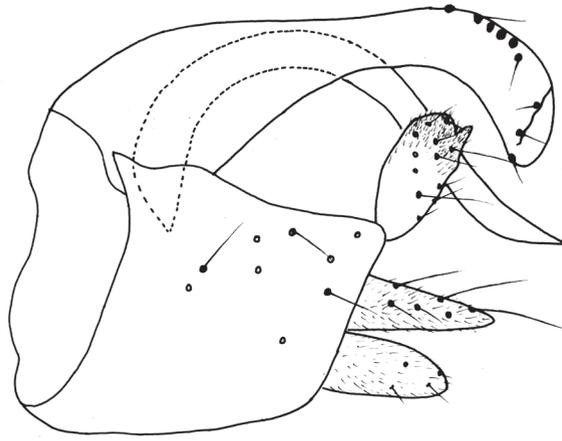


21

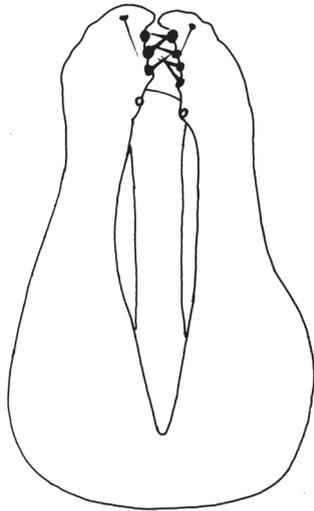
Figure 21. *Lindneromyia longa* sp. nov. (male). Habitus, lateral view.



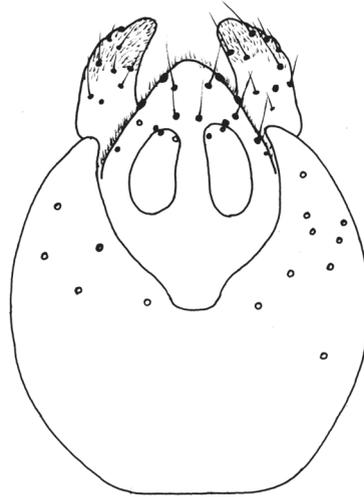
Figures. 22–25. *Lindneromyia longa* sp. nov. (male). 22. wing; 23. hind tarsus, posterior view; 24. abdomen, dorsal view; 25. hind leg, posterior view.



26

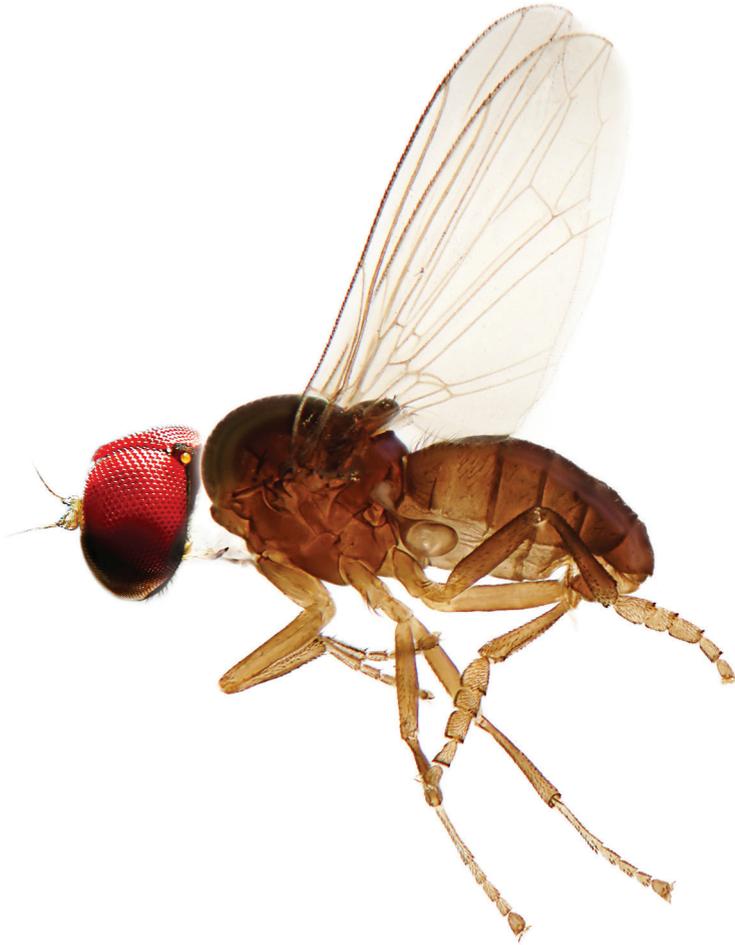


27



28

Figures 26–28. *Lindneromyia longa* sp. nov. (male). 26. Male genitalia, lateral view; 27. Hypandrium and aedeagus, ventral view; 28. Male genitalia, posterior view.



29

Figure. 29. *Lindneromyia obtusa* sp. nov. (male). Habitus, lateral view.



30



31

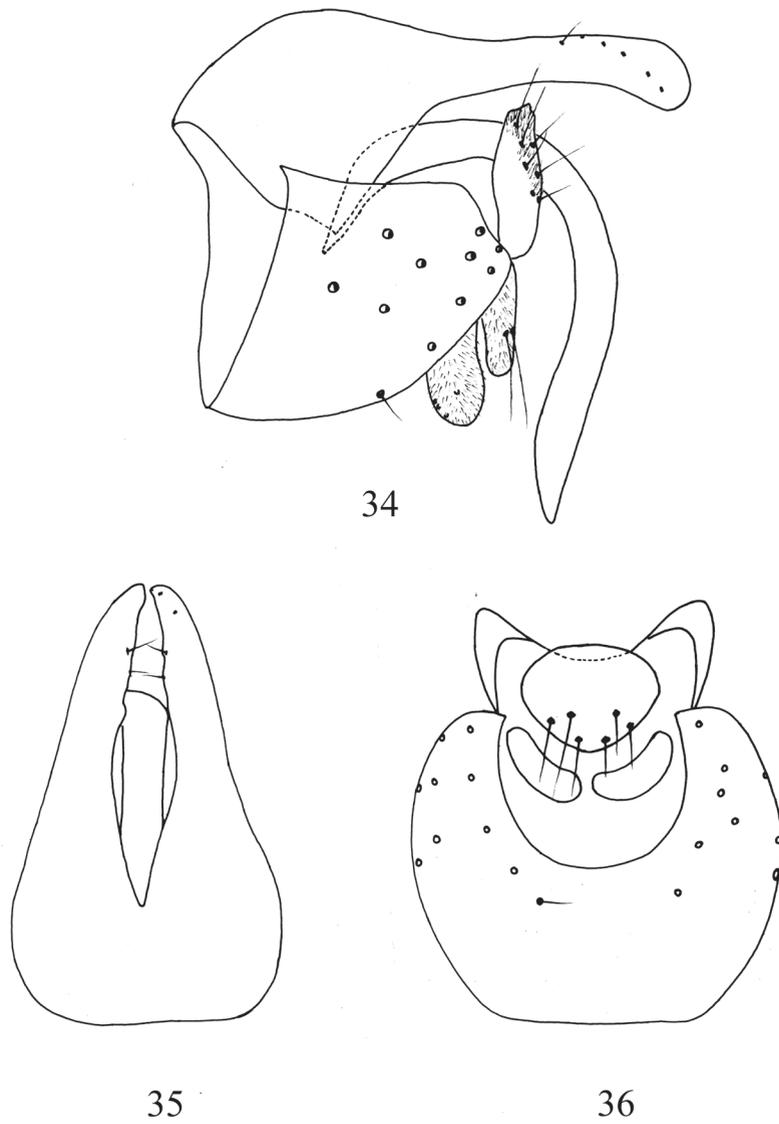


32



33

Figures. 30–33. *Lindneromyia obtusa* sp. nov. (male). 30. wing; 31. hind tarsus, posterior view; 32. abdomen, dorsal view; 33. hind leg, posterior view.



Figures. 34–36. *Lindneromyia obtusa* sp. nov. (male). 34. Male genitalia, lateral view; 35. Hypandrium and aedeagus, ventral view; 36. Male genitalia, posterior view.