Neophyllomyza (Diptera: Milichiidae) Recorded from China with Descriptions of Three New Species

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NEOPHYLLOMYZA (DIPTERA: MILICHIIDAE) RECORDED FROM CHINA WITH DESCRIPTIONS OF THREE NEW SPECIES

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ABSTRACT

The genus *Neophyllomyza* Melander (Diptera: Milichiidae) is recorded from China with the following 3 species as new to science: *N. luteipalpis* **sp. nov.**, *N. lii* **sp. nov.**, and *N. tibetensis* **sp. nov.** A key to the known species of *Neophyllomyza* from China is presented.

Key Words: Diptera, Milichiidae, *Neophyllomyza*, new species, China

RESUMEN

Se registra el género *Neophyllomyza* Melander (Diptera: Milichiidae) en China, con las siguientes 3 especies nuevas para la ciencia: *N. luteipalpis* **sp. nov**., *N. lii* **sp. nov**. y *N. tibetensis* **sp. nov**. Se incluye una clave de las especies de *Neophyllomyza* conocidas en China.

Palabras Clave: Diptera, Milichiidae, *Neophyllomyza*, nuevas especies, China

The genus *Neophyllomyza* Melander, 1913 (Milichiidae: Phyllomyzinae) can be separated from other genera of the subfamily Phyllomyzinae by the following characteristics: paired cruciate setae present along the middle of the front; fronto-orbital setae extending quite to antennae, the upper ones diverging, the lower converging; face excavated, cheeks narrow, oral vibrissae large; proboscis long, slender, geniculate; lunule small, bare; one humeral, 2 notopleural, one presutural, 2 supra-alar; one katepisternal, no anepisternal setae (Melander 1913; Brochu & Wheeler 2009). *Neophyllomyza* Melander is a small genus of acalyptrate flies (Brake 2000), there are 2 Palearctic (Villeneuve 1920; Hendel 1924), 2 Afrotropical (Lamb 1914; Séguy 1938), 2 Australian (Hendel 1907; Curran 1936), 2 Nearctic (Melander 1913; Brochu & Wheeler 2009) and 1 Neotropical species (Williston 1907). Only females of 2 species of *Neophyllomyza* were recorded in China for the first time (Heiduk et al. 2010). Species of *Neophyllomyza* have been recorded to be kleptoparasitic, with adults mostly attracted to predators feeding on stink bugs or squash bugs (Robinson & Robinson 1977; Sivinski & Stowe 1980).

The present paper records the genus *Neophyllomyza* from China for the second time. Also, 3 species, *N. luteipalpis* **sp. nov.**, *N. lii* **sp. nov.**, and *N. tibetensis* **sp. nov.**, are described as new to science. A key to the known species of *Neophyllomyza* from China is presented. Specimens examined were deposited in the Entomological Museum of China Agricultural University, Beijing (CAU).

MATERIALS AND METHODS

Morphological terminology follows McAlpine (1981) & Brake (2000). The following abbreviations are used: asc = apical scutellar seta(e), bsc = basal scutellar seta(e), dc = dorsocentral seta(e), h = humeral seta(e), ia = intraalar seta(e), kepsts = katepisternal seta(e), npl = notopleural seta(e), pa = postalar seta(e), prs = presutural seta(e), prsc = prescutellar seta(e), sa = supraalar seta(e), S = sternite, T = tergite.

KEY TO THE CHINESE SPECIES (MALES) OF *NEOPHYLLOMYZA*

1. First flagellomere nearly circular; surstylus slightly shorter, apical tip acute 2

—. First flagellomere approximately square; surstylus slightly longer, apical tip flat (Fig. 15) . . . . . *N. tibetensis* **sp. nov.**

2. M_1 between r-m and dm-cu 1.8 times as long as dm-cu; cercus widened with blunt apical margin (Fig. 3) . . . . . *N. luteipalpis* **sp. nov.**

—. M_1 between r-m and dm-cu 1.2 times as long as dm-cu; cercus narrow with slightly sharp apical margin (Fig. 9) . . . . . *N. lii* **sp. nov.**

NEOPHYLLOMYZA LUTEIPALPIS SP. NOV.
(Figs. 1-6)

Diagnosis

Gena very narrow, approximately one-nineteenth of eye height. Palpus darkish yellow, brownish towards tip and apically with strong setae (Fig. 1). Epandrium irregularly hemispherical with strong setae; surstylus elongate and margin with dense setulae; cercus bifurcated and with long setae (Figs. 3 and 4).

Male

Body length 1.4 mm; wing length 1.4 mm.

Head black with grayish microtomentum; orbital plates subshiny black without microtomentum; ocellar triangle black without microtomentum; lunule small, yellow with brownish yellow margin. Posterior eye margin ventrally diverging from head margin; eye 1.6 times as high as long, gena approximately one-nineteenth of eye height. Setae and setulae on head black; ocellar triangle with 2 ocellar setae and 3 short setae; frons with 2 orbital and 2 frontal setae, orbital setae laterоclinate and frontal setae medioclinate, 4 interfrontal setae; postocellar setae cruciate. Vibrissal angle relatively obtuse; vibrissa strong, located above the level of lower eye margin. Antenna blackish brown with microtomentum; pedicel with short black setulae at middle and margin, setulae at margin longer than others, longest one about 3 times longer than others; first flagellomere with pubescence, nearly circular; arista 3.5 times as long as first flagellomere, black, distinctly pubescent. Proboscis long, geniculate, darkish and yellow, margin without setulae. Palpus rod-like with blunt apex in lateral view, about 0.2 mm, 5 times longer than wide; darkish yellow, brownish apex and with short dense black pubescence, apically with short and long sparse strong setae.

Thorax darkish brown with grey microtomentum, except mesonotum shiny blackish brown with sparse black microtomentum; scutellum darkish brown with gray microtomentum. Setae and setulae on thorax black; 1 h, 2 dc, 1 prsc, 2 npl, 1 prs, 2 sa, 2 pa, 1 kepsts (setulae at forward position); scutellum 2 times wider than long, with pair of asc and bsc, asc 3 times longer than bsc. Legs slender, coxae and femora darkish brown, tibiae dark brown except fore tibia with both ends yellowish, tarsi yellowish. Setae and setulae on legs black. Mid tibia with 1 black preapical dorsal seta; hind first tarsomere with posteroventral comb setae. Wing hyaline, unspotted; veins brown; Sc strong; M_1 between r-m and dm-cu longer than dm-cu. Calpter yellowish with dense brownish microtrichae, margin with long setulae. Knob of halter yellowish white, stalk yellow.

Abdomen darkish brown with gray microtomentum. Setae and setulae on abdomen black; T2-T5 with setae, marginal setae longer than others; sternites with sparse black setulae at posterior 3/4. Posteromedial triangular projection of T1 into T2 strong; S2 irregularly horseshoe-shaped; S3 irregularly trapezoid, apical margin 1.8 times wider than basal margin; S4 irregularly trapezoid, apical margin 2 times wider than basal margin, area bigger than S3; S5 horizontally trapezoid, apical margin slightly upward arched, 2 times wider than long.

Male genitalia (Figs. 3-6). Epandrium with strong setae, irregularly hemispherical; surstylus elongate and margin with dense setulae. Hypandrium arched. Distiphallus membranous, conical; subepandrial sclerite well developed; phallapodemic sclerite rod-like. Cercus bifurcated with long setae.

Female

Body length 1.6 mm; wing length 1.6 mm.

Similar to male, but palpus shorter. *Female terminalia*: Tergite 8 distinctly extended, U-shaped, margin darkish brown except base. Supra-anal plate irregularly triangular; subabal plate irregularly pentagonal, apically longer and slightly sharpened. Cercus long, apically nearly acute; dark brown with sparse setulae.

Type Material

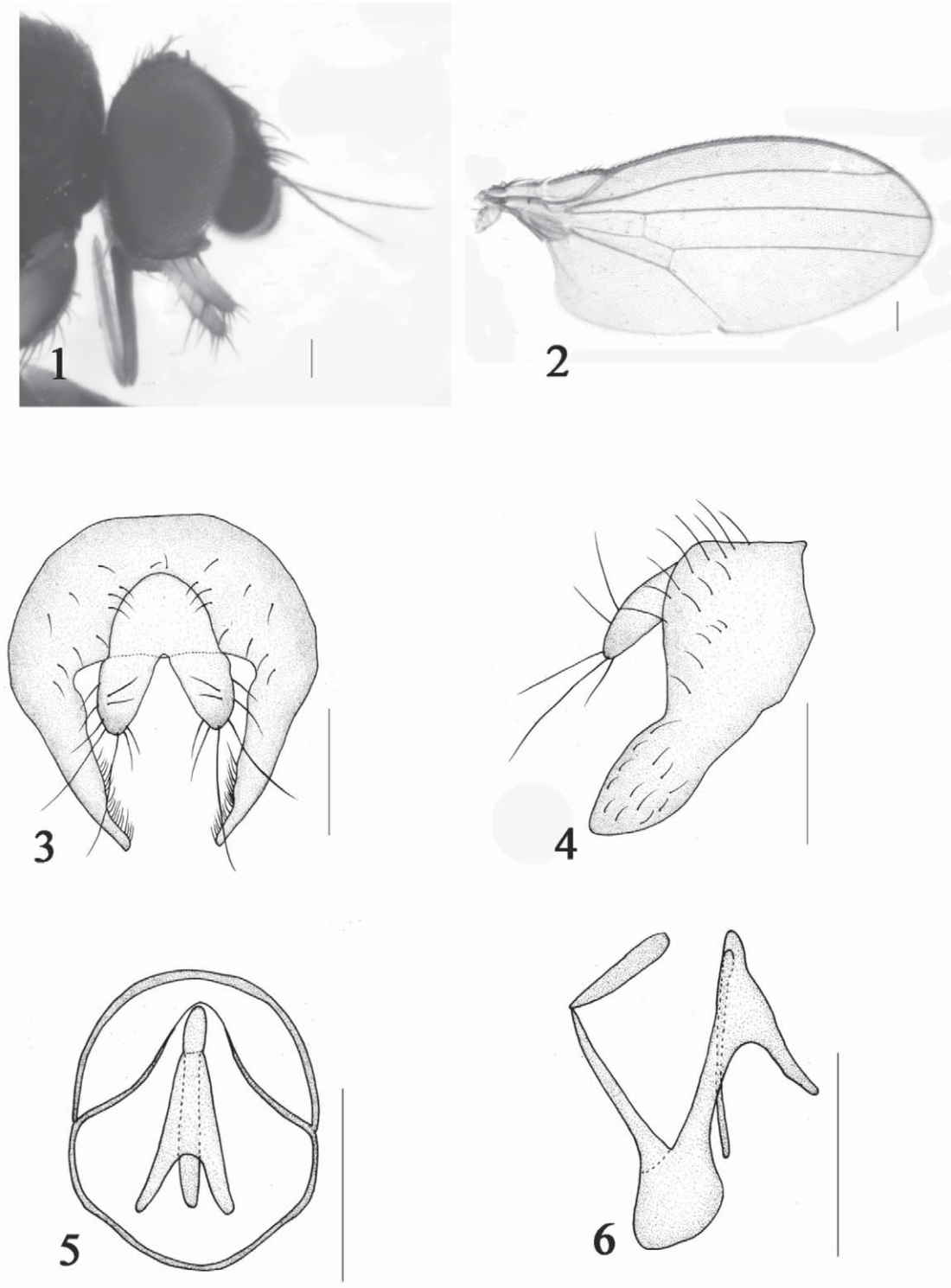
HOLOTYPE ♂, CHINA: Yunnan, Baoshan (N 25° 17' 32.85" E 98° 48' 23.08"), Baihualing, 1,575 m, 2012.V.12, W. L. Li (CAU); PARATYPES: 1 ♂, China: Yunnan, Yingjiang (N 24° 36' 56.63" E 97° 39' 23.09"), Xima Town, 1,390 m, 2012.V.5, W. L. Li (CAU); 1 ♂, China: Yunnan, Tengchong (N 25° 29' 15.92" E 98° 32' 28.86"), Guangming Town, 1,835 m, 2012.V.7, W. L. Li (CAU); 3♀, China: Yunnan, Baoshan (N 25° 17' 32.85" E 98° 48' 23.08"), Baihualing, 1,575 m, 2012.V.16, W. L. Li (CAU).

Distribution

China (Yunnan).

Remarks

This new species is similar to *N. leanderi* (Hendel), but it can be separated from the latter by the following features: M_1 between r-m and dm-cu 1.8 times as long as dm-cu; palpus 0.6 times as long as horizontal eye diameter; thorax and abdomen darkish brown. In *N. leanderi*, M_1 between r-m and dm-cu is 1.3 times as long as dm-cu; the palpus is 0.4 times as long as the horizontal eye diameter; the thorax and abdomen are black (Hendel 1924).



Figs. 1-6. *Neophyllomyza luteipalpis* **sp. nov.** (male). 1, Head, lateral view; 2, Wing; 3, Epandrium, cercus, and surstylus in posterior view; 4, Epandrium, cercus, and surstylus in lateral view; 5, Genitalia in posterior view (distiphallus; hypandrium; phallapodeme; subepandrial); 6, Genitalia in lateral view (distiphallus; hypandrium; phallapodeme; subepandrial). Scale bar = 0.1 mm.

Etymology

The name of the new species refers to the color of the palpus.

NEOPHYLLOMYZA LII **SP. NOV.**
(Figs. 7-12)

Diagnosis

Gena narrowed, approximately one-twelfth of eye height; palpus brownish and apically with short and long sparse black setae (Fig. 7); epandrium irregularly hemispherical with strong setae; surstylus elongate and the apically slightly acute, margin with dense setulae; cercus bifurcated and elongate, with long setae (Figs. 9 and 10).

Male

Body length 1.4 mm; wing length 1.2 mm.

Head black with grayish microtomentum. Orbital plate subshiny black with microtomentum; ocellar triangle brownish without microtomentum; lunule small, yellow with brown margin. Posterior eye margin ventrally diverging from head margin, eye 1.4 times as high as long, gena approximately one-twelfth of eye height. Setae and setulae on head black; ocellar triangle with 2 long ocellar setae and 3 short setae; frons with 2 orbital and 2 frontal setae, orbital setae lateroclinate and frontal setae medioclinate, 3 interfrontal setae; postocellar setae cruciate. Vibrissal angle relatively blunt, vibrissa strong and located at level of lower eye margin. Antenna blackish brown with brownish microtomentum; pedicel with short black setae at middle and margin, longest one about 2.5 times than others; first flagellomere with pubescence, nearly circular (slightly narrowed basally); arista darkish brown, pubescence very short, 3 times as long as first flagellomere. Proboscis long, geniculate, darkish yellow with short sparse black setulae. Palpus rod-like with blunt apex in lateral view, about 0.2 mm, 4.5 times longer than wide; brownish with short dense black pubescence, apically with short and long sparse black setae.

Thorax darkish brown with grey microtomentum except mesonotum shiny blackish brown with sparse black microtomentum; scutellum blackish brown with gray microtomentum. Setae and setulae on thorax black; 1 h, 2 dc, 1 prsc, 2 npl, 1 prs, 1 ia, 2 sa, 2 pa, 1 kepsts (a row setulae at forward position); scutellum 1.5 times wider than long and with pair of asc and bsc, asc 2.5 times longer than bsc. Legs slender, coxae, femora and tibiae brownish, tarsi yellow. Setae and setulae on legs black. Mid tibia with 1 black preapical dorsal seta, hind first tarsomere with posteroventral comb setae. Wing hyaline; veins brown; Sc strong; M_1 between r-m and dm-cu a little longer than dm-cu. Calpter yellowish with dense brownish microtrichae and margin with brownish setulae. Knob of halter yellowish, stalk yellow.

Abdomen brownish yellow with gray microtomentum. Setae and setulae on abdomen black; T2-T5 with setae at posterior 3/4, rowed marginal setae longer than others; sternites with sparse setulae. Posteromedial triangular projection of T1 into T2 weak; S2 generally horseshoe-shaped, apically slightly blunt; S3 vertically rectangular; S4 irregularly trapezoid; S5 irregularly trapezoid, apical margin smooth and arched, 2.5 times longer than wide.

Male genitalia (Figs. 9-12). Epandrium irregularly hemispherical, with strong setae; surstylus elongate and slightly acuted apically, margin with dense setulae. Hypandrium U-shaped. Distiphallus membranous, conical; subepandrial sclerite well-developed; phallapodemic sclerite thin rod-like. Cercus bifurcated, elongate with long setae.

Female

Unknown.

Type Material

HOLOTYPE ♂, CHINA: Yunnan, Yingjiang (N 24° 36' 56.63" E 97° 39' 23.09"), Tongbiguan Town, 1,340 m, 2012.V.1, W. L. Li (CAU). PARATYPE 1 ♂, China: Yunnan, Baoshan (N 25° 19' 18.84" E 100° 08' 32.04"), Dahaoping, 1,925 m, 2012.V.11, W. L. Li (CAU).

Distribution

China (Yunnan).

Remarks

This new species is similar to *N. luteipalpis* **sp. nov.**, but it can be separated from the latter by the following features: palpus brownish; M_1 between r-m and dm-cu 1.2 times as long as dm-cu; surstylus slightly sharp apically; cercus bifurcated and narrowed. In *N. luteipalpis*, the palpus is darkish yellow and apically brownish; M_1 between r-m and dm-cu is 1.8 times as long as dm-cu; the surstylus is blunted apically; the cercus is bifurcated and broaded.

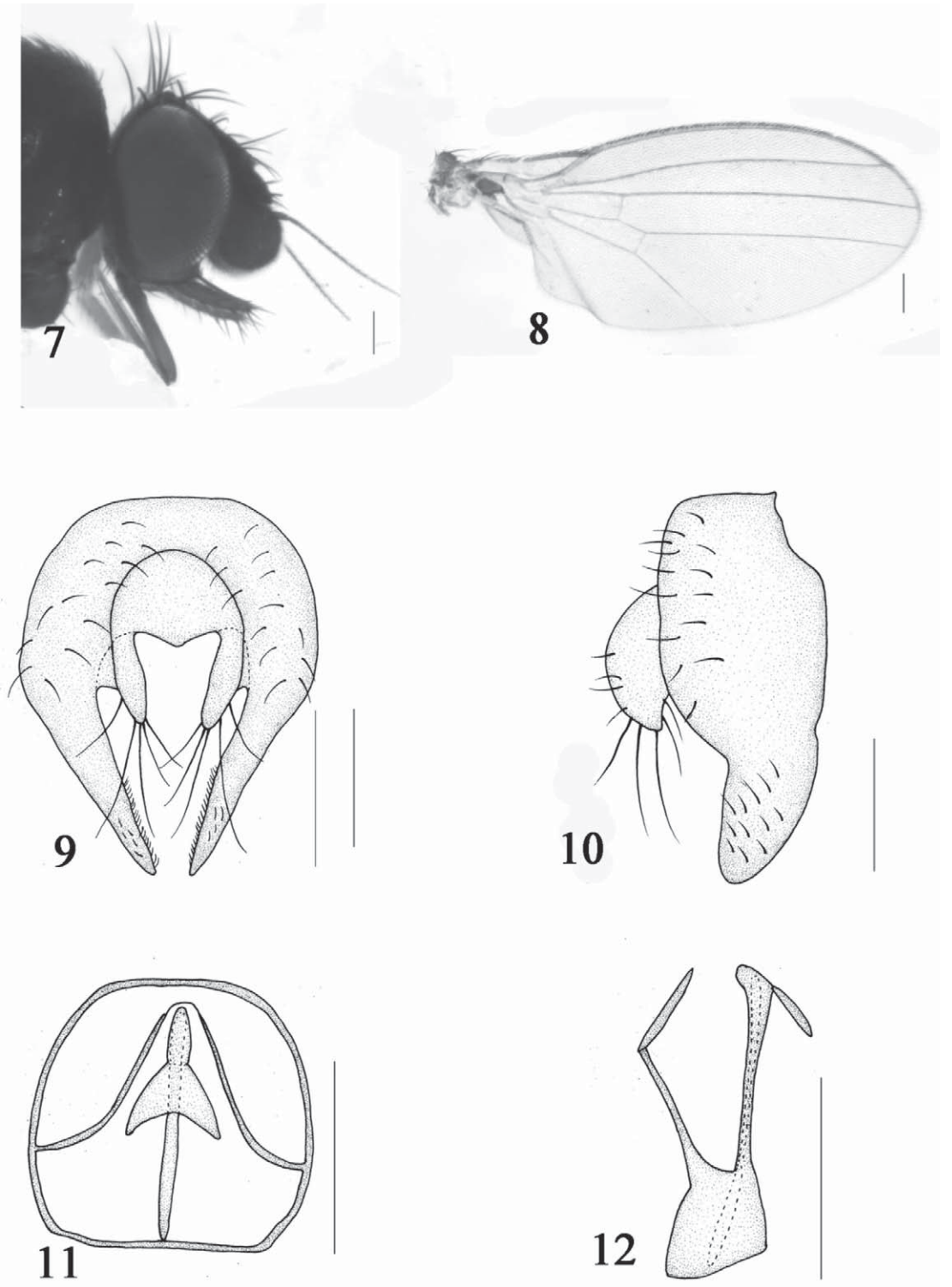
Etymology

The specific name refers to the collector Dr. Wenliang Li.

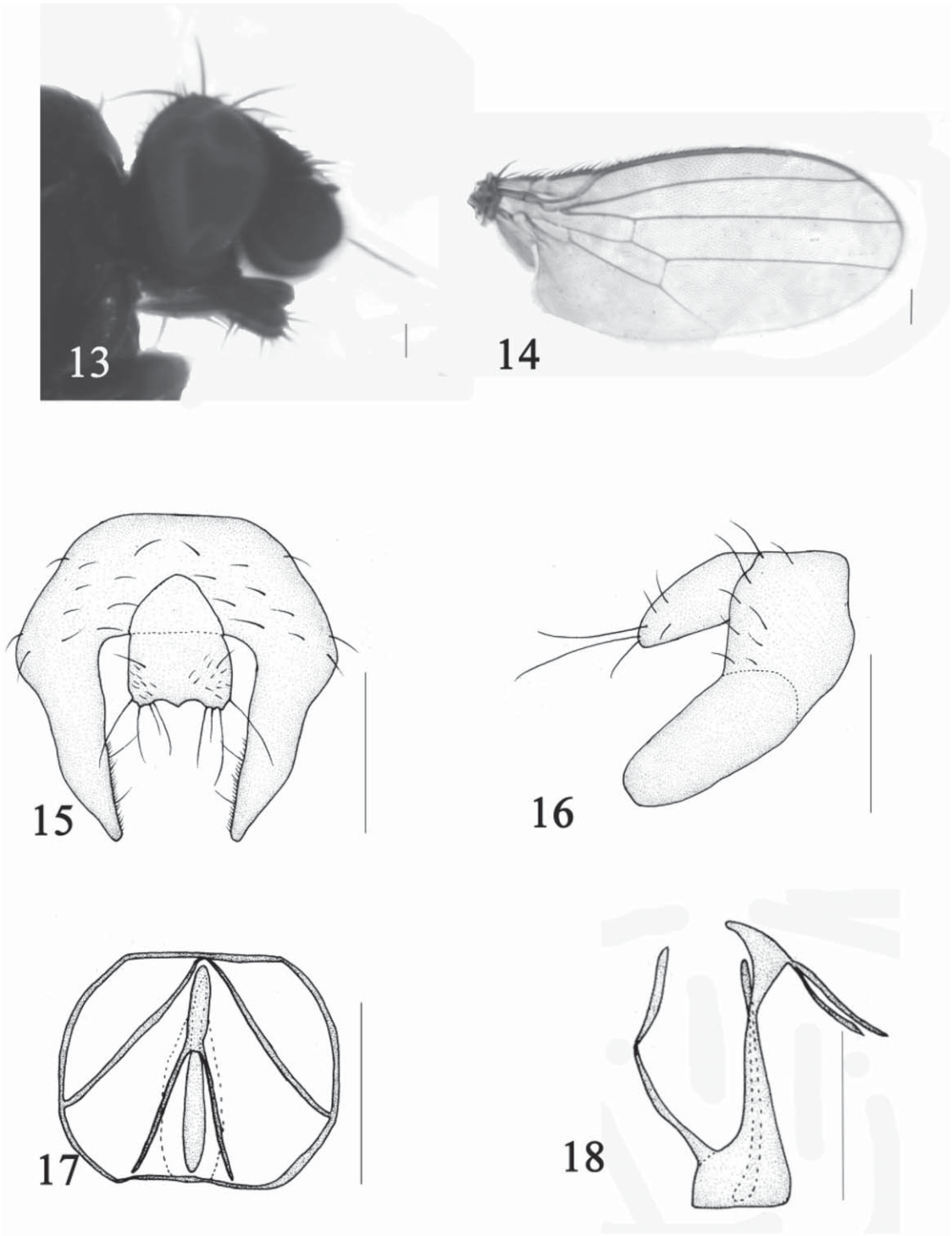
NEOPHYLLOMYZA TIBETENSIS **SP. NOV.**
(Figs. 13-18)

Diagnosis

Gena relatively narrowed, approximately one-eighth of eye height. Palpus darkish brown and



Figs. 7-12. *Neophyllomyza lii* **sp. nov.** (male). 8, Wing; 9, Epandrium, cercus, and surstylus in posterior view; 10, Epandrium, cercus, and surstylus in lateral view; 11, Genitalia in posterior view (distiphallus; hypandrium; phallapodeme; subepandrial); 12, Genitalia in lateral view (distiphallus; hypandrium; phallapodeme; subepandrial). Scale bar = 0.1 mm.



Figs. 13-18. *Neophyllomyza tibetensis* **sp. nov.** (male). 13, Head, lateral view; 14, Wing; 15, Epandrium, cercus, and surstylus in posterior view; 16, Epandrium, cercus, and surstylus in lateral view; 17, Genitalia in posterior view (distiphallus; hypandrium; phallapodeme; subepandrial); 18, Genitalia in lateral view (distiphallus; hypandrium; phallapodeme; subepandrial). Scale bar = 0.1 mm.

apically with black sparse setae (Fig. 13). Epandrium irregularly saddle-shaped, with strong setae; surstylus elongate and slightly blunted apically, margin with dense setulae; cercus broad with long setae (Figs. 15 and 16).

Male

Body length 1.2 mm; wing length 1.2 mm. Head brown with grayish microtomentum. Orbital plate subshiny blackish brown with microtomentum; ocellar triangle blackish brown without microtomentum; lunule small, blackish brown with black margin. Posterior eye margin ventrally diverging from head margin, eye 1.5 times as high as long, gena approximately one-eighth of eye height. Setae and setulae on head black; ocellar triangle with 2 long ocellar setae and 3 short setae; frons with 2 orbital and 2 frontal setae, orbital setae lateroclinate and frontal setae medioclinate, 3 interfrontal setae; postocellar setae converging. Vibrissal angle relatively round and blunt, vibrissa strong and located at level of lower eye margin. Antenna darkish brown with brownish microtomentum; pedicel with short black setae at middle and margin, longest one about 2 times than others; first flagellomere with pubescence, approximately square; arista 2.5 times as long as first flagellomere, darkish brown, pubescent very short. Proboscis geniculate, blackish brown. Palpus somewhat rod-like with blunt apex, uniform in width in lateral view, approximately 0.2 mm, 4 times longer than wide; darkish brown with short dense black pubescence, apically with sparse black setae.

Thorax darkish brown with grey microtomentum, except mesonotum shiny blackish brown with sparse black microtomentum; scutellum blackish brown with gray microtomentum. Setae and setulae on thorax black; 1 h, 2 dc, 1 prsc, 2 npl, 1 prs, 2 sa, 2 pa, 1 kepsts (a row setulae at forward position); scutellum 1.6 times wider than long, with pair of asc and bsc, asc 3 times longer than bsc. Legs slender, darkish brown. Setae and setulae on legs black. Mid tibia with 1 black preapical dorsal seta. Wing hyaline; veins brown; Sc strong; M_1 between r-m and dm-cu little longer than dm-cu. Calypter yellowish with dense brownish microtrichae, margin with brownish setulae. Knob of halter darkish brown, stalk dark brown.

Abdomen darkish brown with gray microtomentum. Setae and setulae on abdomen black; T2-T5 with setae at posterior 3/4, marginal setae longer than others; sternites with sparse setulae. Posteromedial triangular projection of T1 into T2 weak; S2 horseshoe-shaped, apically narrowed; S3 vertically trapezoid; S4 irregularly trapezoid; S5 trapezoid, apical margin arched, 2 times longer than wide; S3 to S5 gradually enlarged.

Male genitalia (Figs. 15-18): Epandrium irregularly saddle-shaped with strong setae; surstylus elongate and slightly blunted apically, margin with dense setulae. Hypandrium U-shaped. Distiphallus membranous, long conical; subepandrial sclerite well-developed; phallapodemic sclerite rod-like. Cercus broad with long setae.

Female

Body length 1.3 mm; wing length 1.4 mm.

Similar to male, but palpus shorter. *Female terminalia*: Tergite 8 distinctly extended with short dense darkish brown pubescence. Supraanal plate irregularly trapezoid; subabal plate irregularly conical, blunted apically. Cercus long conical, brown with sparse setulae.

Type Material

HOLOTYPE ♂, CHINA: Tibet, Linzhi (N 29° 38' 32.58" E 94° 21' 32.55"), Bayi Town, 2012.V.5, W. L. Li (Malaise trap) (CAU). PARATYPE 1 ♀, China: Tibet, Linzhi (N 29° 38' 32.58" E 94° 21' 32.55"), Bayi Town, 2012.VI.30, X. K. Li (Malaise trap) (CAU).

Distribution

China (Tibet).

Remarks

This new species is similar to *N. quadricornis* Melander, but it can be separated from the latter by the following features: halter darkish brown; calypter yellowish; surstylus narrowed apically; cercus flat apically. In *N. quadricornis*, the halter is dull black; the calypter is dusky; the surstylus is rounded apically; the cercus is rounded apically (Melander 1913; Brochu & Wheeler 2009).

Etymology

The specific name refers to the type locality Tibet.

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