

A new species and a newly-recorded species in the genus *Neophyllomyza* (Diptera: Milichiidae) from China

Chang LIU^{1,2,3}, Yida GUO^{1,2,3}, Ding YANG⁴, Lijuang ZHANG^{1,2,3}, Yuqiang XI^{1,2,3}①

1. College of Plant Protection, Henan Agricultural University, Zhengzhou, Henan 450002, China

2. Henan International Laboratory for Green Pest Control, Zhengzhou, Henan 450002, China

3. Henan Engineering Laboratory of Pest Biological Control, Zhengzhou, Henan 450002, China

4. College of Plant Protection, China Agricultural University, Beijing 100193, China

Abstract: A species in the genus *Neophyllomyza* Melander, *Neophyllomyza obliquusa* **sp. nov.**, is described as new to science and *Neophyllomyza acyglossa* (Villeneuve, 1920) is reported for the first time from China. An updated key to the species of *Neophyllomyza* from China is presented.

Key words: Phyllomyzinae; taxonomy; key

中国新叶蝇属一新种和一新记录种记述（双翅目：叶蝇科）

刘畅^{1,2,3}，郭一达^{1,2,3}，杨定⁴，张利娟^{1,2,3}，席玉强^{1,2,3}①

1. 河南农业大学植物保护学院，河南 郑州 450002；2. 河南省害虫绿色防控国际联合实验室，河南 郑州 450002；3. 河南省害虫生物防控工程实验室，河南 郑州 450002；4. 中国农业大学植物保护学院，北京 100193

摘要：记述新叶蝇属 1 新种：斜脉新叶蝇 *Neophyllomyza obliquusa* **sp. nov.** 及 1 中国新记录种：舌须新叶蝇 *Neophyllomyza acyglossa* (Villeneuve, 1920)，提供了新种和新记录种的特征图，并编制了中国新叶蝇属的分种检索表。

关键词：真叶蝇亚科；分类；检索表

Introduction

Neophyllomyza Melander, 1913 belongs to the subfamily Phyllomyzinae in the family Milichiidae, which is distributed worldwide. It is characterized 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, gena narrow, oral vibrissae large; proboscis long, slender, geniculate; lunule small, bare; one humeral, two notopleural, one presutural, two supra-alar; one katepisternal, no anepisternal setae (Melander 1913; Brochu & Wheeler 2009).

Seven known Chinese species are recorded (Xi & Yang 2014, 2017; Xi *et al.* 2019). In this paper, a species in the genus *Neophyllomyza* from China is described as new to science

and a newly-recorded species is re-described. A key to the species of *Neophyllomyza* from China is provided.

Material and methods

Genitalia preparations were made by removing and macerating the apical portion of the abdomen in glacial acetic acid, then rinsing them in distilled water before storing them in glycerine-filled microvials. After examination, genitalia were transferred to fresh glycerine and stored in a microvial on the pin below the specimen or moved to an ethanol tube together with the wet specimens. Specimens examined are deposited in the Entomological Museum of Henan Agricultural University (HAU), Zhengzhou and the Entomological Museum of China Agricultural University (CAU), Beijing. The general terminology follows McAlpine (1981) and Brake (2000). The following abbreviations are used: asc — apical scutellar seta(e); pa — postalar seta(e); bsc — basal scutellar seta(e); pos — postsutural seta(e); dc — dorsocentral seta(e); prs — presutural seta(e); h — humeral seta(e); prsc — prescutellar seta(e); ia — intraalar seta(e); sa — supraalar seta(e); kepsts — katepisternal seta(e); S — sternite; npl — notopleural seta(e); T — tergite.

Taxonomy

Key to species of *Neophyllomyza* from China

1. Postocellar setae cruciate 2
- Postocellar setae convergent 6
2. Gena extremely narrow, approximately one-nineteenth of eye height; vibrissal angle relatively acute
..... *N. luteipalpis* Xi & Yang
- Gena relatively wide; approximately one-fifteenth of eye height; vibrissal angle relatively blunt 3
3. Lunule darkish brown; M_1 between r-m and dm-cu a little longer than dm-cu *N. lii* Xi & Yang
- Lunule yellow; M_1 between r-m and dm-cu obviously longer than dm-cu 4
4. First flagellomere irregularly quadrangular; palpus length 0.2 mm *N. acyglossa* (Villeneuve)
- First flagellomere irregularly circular; palpus length less than 0.2 mm 5
5. Ocellar triangle brownish; antenna and arista brownish; tibiae brown *N. flavescens* Xi & Yang
- Ocellar triangle black; antenna and arista brown; tibiae dark brown *N. obtusus* Xi, Yang & Yin
6. Frons with 4 interfrontal setae; first flagellomere irregularly circular *N. tibetensis* Xi & Yang
- Frons with 3 interfrontal setae; first flagellomere other shaped 7
7. First flagellomere irregularly fanned; palpus length 0.1 mm *N. leanderi* (Hendel)
- First flagellomere irregularly rectangular or quadrangular; palpus length 0.2 mm 8
8. M_1 between r-m and dm-cu 1.1 times longer than dm-cu; first flagellomere irregularly rectangular
..... *N. obliquosa* sp. nov.
- M_1 between r-m and dm-cu at least 1.5 times longer than dm-cu; first flagellomere irregularly quadrangular 9
9. Palpus yellowish; tibiae yellow; halter yellowish *N. motuoensis* Xi, Yang & Yin
- Palpus brown; tibiae darkish brown; halter brownish *N. clavipalpis* Xi, Yang & Yin

1. *Neophyllomyza obliquusa* sp. nov. (Fig. 1)

Description. Male. Body length 1.2–1.5 mm; wing length 1.2–1.5 mm.

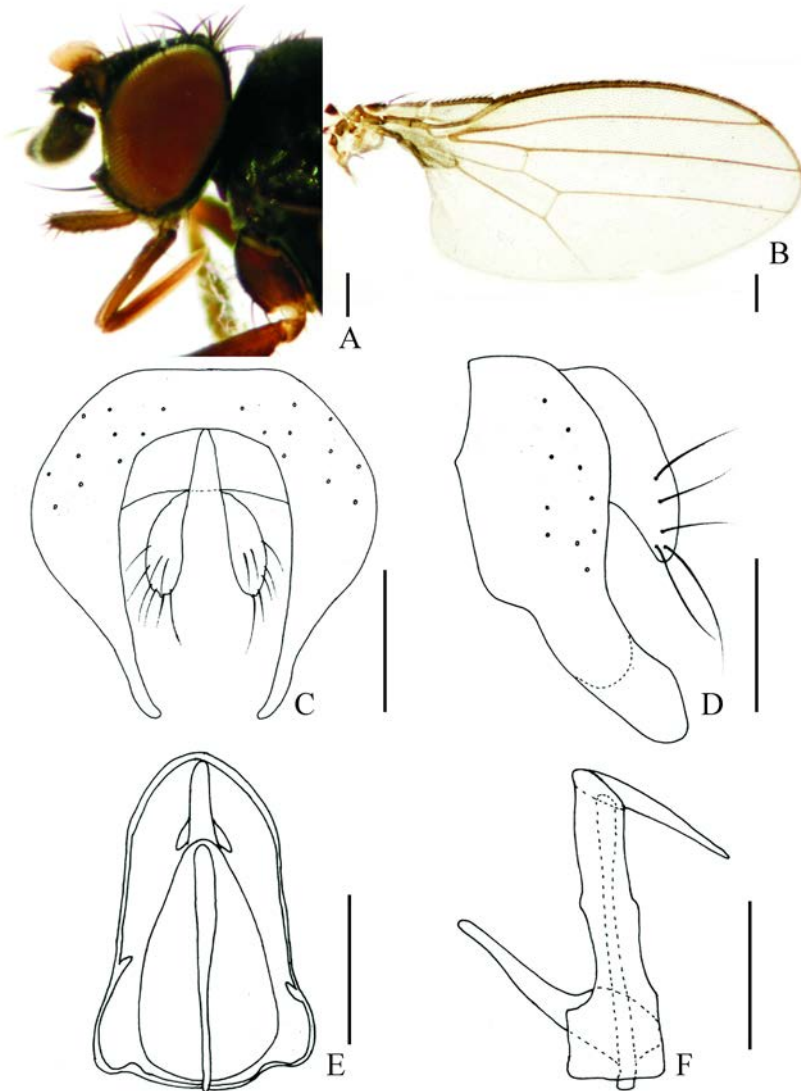


Figure 1. *Neophyllomyza obliquusa* sp. nov., ♂. A. Head, lateral view; B. Wing; C, D. Epandrium, cerci, and surstylus, posterior and lateral views; E, F. Hypandrial complex, ventral and lateral views. Scale bars = 0.1 mm.

Head (Fig. 1A) brownish with greyish microtomentum; orbital plate satiny blackish brown without microtomentum, ocellar triangle darkish brown without microtomentum; lunule small, blackish with black margin. Posterior eye margin ventrally diverging from head margin; eye 1.4 times as high as long, gena approximately one-eleventh of eye height. Setae and setulae on head black; ocellar triangle with two ocellar setae and three short setae; frons with two orbital and two frontal setae, orbital setae latero-clinate and frontal setae

mediocline, three interfrontal setae; postocellar setae convergent. Vibrissal angle relatively blunt; vibrissa strong, located below the level of lower margin of eye. Antenna darkish brown, with microtomentum; pedicel with short black setae at middle and margin, setulae at margin longer than others, longest one approximately 1.5 times longer than others; first flagellomere with pubescence, approximately rectangular, apical margin smooth; arista 4 times as long as first flagellomere, black, pubescent very short. Proboscis geniculate, yellowish at apical and dark yellow at basal, margin without setulae. Palpus rod-like, with blunt apex, narrow, approximately 0.2 mm, 5 times longer than wide; yellow with short dense yellowish pubescence, margin with black sparse setae.

Thorax darkish brown with grey microtomentum, except scutum shiny blackish-brown with sparse black microtomentum; scutellum darkish brown with grey microtomentum. Setae and setulae on thorax black; one h, two dc, one prsc, two npl, one prs, one pa, one kepsts (setulae at forward position); scutellum 2 times wider than long, with pair of asc and bsc, asc 2.5 times longer than bsc. Legs slender, darkish brown. Setae and setulae on legs black. Mid tibia with one black preapical dorsal seta. Wing hyaline (Fig. 1B), unspotted; veins brown; Sc strong; M_1 between r-m and dm-cu a little longer than dm-cu. Calypter yellowish, with dense brownish microtrichiae, margin with brownish setulae. Knob of halter brownish, stalk brown.

Abdomen darkish brown with grey microtomentum. Setae and setulae on abdomen black; TII–TV with setae, marginal setae slightly longer than others; sternites with sparse black setulae. SII irregularly luniform, SIII irregularly circular, SIV trapezoidal; SV very shallowly falciform, apical margin extended to basal margin. Male genitalia (Figs 1C–F): epandrium irregularly semicircular with strong setae; surstylus elongate and wide, with dense setulae on margin; hypandrium irregularly U-shaped; subepandrial sclerite well-developed; cercus wide with long setae.

Female. Unknown.

Holotype. ♂, **China**, Tibet, Motuo, Beibeng, 700 m, 29.24°N, 95.17°E, 30-VII-2012, Wenliang LI; **Paratypes.** 1♂, **China**, Tibet, Motuo, 80K, 950 m, 29.65°N, 95.48°E, 23-VII-2012, Wenliang LI; 1♂, **China**, Taiwan, Yilan, Fushan Botanical Garden, 650 m, 24.75°N, 121.59°E, 08-VI-2012, Wenliang LI; 2♂, **China**, Tibet, Motuo, Beibeng, 680 m, 29.22°N, 95.10°E, 16-IX-2013, Gang YAO.

Etymology. The specific epithet refers to the angle of the veins.

Diagnosis. Gena relatively narrowed, approximately one-eleventh eye height; palpus yellowish, apically with black sparse setae (Fig. 1A). Epandrium irregularly semicircular with strong setae; surstylus elongate and margin with dense setulae. Hypandrium irregularly U-shaped; phallapodeme rod-like (Figs 1D, 1E).

Remarks. This new species is somewhat similar to *N. motuoensis* Xi, Yang & Yin, but can be differentiated from the latter by the following features: M_1 between r-m and dm-cu 1.1 times as long as dm-cu; knob of halter brownish, stalk brown; hypandrium irregularly U-shaped. In *N. motuoensis*, M_1 between r-m and dm-cu is 1.5 times as long as dm-cu; knob of halter yellowish white, stalk brownish; hypandrium narrowed, irregularly quadrate (Xi *et al.* 2019).

2. *Neophyllomyza acyglossa* (Villeneuve, 1920)

Phyllomyza acyglossa Villeneuve, 1920: 70 (vichyia). Type locality: France (Vichy).

Neophyllomyza acyglossa Duda, 1935: 39. Type locality: Poland (Habelschwerdt, Gliwice).

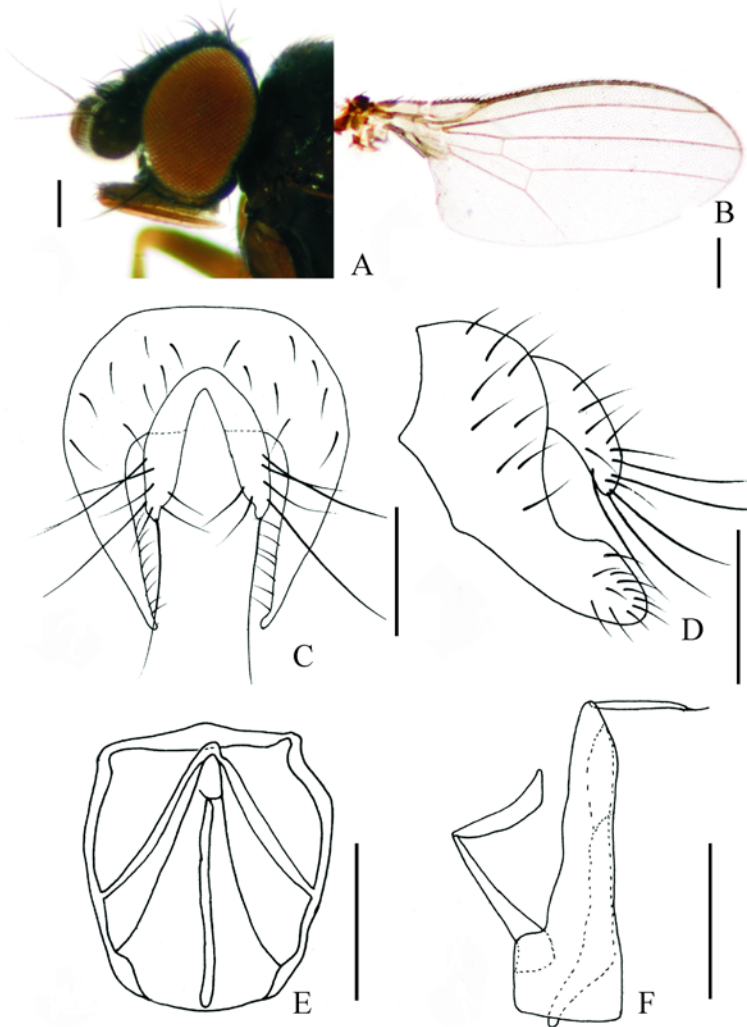


Figure 2. *Neophyllomyza acyglossa* (Villeneuve, 1920). A. Head, lateral view; B. Wing; C, D. Epandrium, cerci, and surstylus, posterior and lateral views; E, F. Hypandrial complex, ventral and lateral views. Scale bars = 0.1 mm.

Specimens examined. 1♂, **China**, Tibet, Motuo, Beibeng, 700 m, 29.24°N, 95.17°E, 30-VII-2012, Xuankun LI; 3♂, **China**, Tibet, Motuo, 80K, 950 m, 29.65°N, 95.48°E, 23-VII-2012, Wenliang LI; 2♂, **China**, Guangxi, Fangchenggang, Shangsi, 450 m, 21.89°N, 107.82°E, 16-V-2013, Guoquan WANG; 1♂, **China**, Yunnan, Dehong, Ruili, 780 m, 24.02°N, 97.85°E, 20-VI-2012, Yuanye LIU.

Distribution. China (Tibet, Guangxi, Yunnan); France; Poland.

Diagnosis. Body length 1.3–1.5 mm; wing length 1.3–1.5 mm. Gena narrowed,

approximately one-eleventh eye height; palpus brownish, apically with both short and long sparse black setae; epandrium irregularly hemispherical, with strong setae; surstylus elongate with apex slightly blunt, margin with dense setulae; cercus wide and oval-shaped, with long setae.

Acknowledgements

We are grateful to Dr. Wenliang LI (Luoyang), Dr. Guoquan WANG (Guangxi), Dr. Xuankun LI (Beijing), and Dr. Yuanye LIU (Shaanxi) for their kind help in collecting the specimens. This work was supported by the Natural Science Foundation of Henan (232300420010), Undergraduate Teaching Engineering Course Construction Project of Henan Agricultural University (2023KC03; 2024KC14), the National Natural Science Foundation of China (32470470; 31672333), the Special Foundation for National Science and Technology Basic Research Program of China (2018FY100400), the earmarked fund for CARS (CARS-27) and the Natural Science Youth Innovation Fund of Henan Agricultural University (KJCX 2019A11).

References

- Brake I. 2000. Phylogenetic systematics of the Milichiidae (Diptera, Schizophora). *Entomologia Scandinavica*, 57(supplement): 1–120.
- Brochu K & Wheeler TA. 2009. Systematics and ecology of the Nearctic species of *Neophyllomyza* (Diptera: Milichiidae). *Canadian Entomologist*, 141: 103–111.
- Duda O. 1935. Beitrag zur Kenntnis der paläarktischen Madizinae. *Naturhistorisch Maandblad*, 24: 37–40.
- McAlpine JF. 1981. Morphology and terminology-adults. In: McAlpine JF, Peterson BV, Shewell GE, Teskey HJ, Vockeroth JR & Wood DM (Eds.), *Manual of Nearctic Diptera. Vol. 1*. Agriculture Canada Monograph, Canada, pp. 9–63.
- Melander AL. 1913. A synopsis of the dipterous groups Agromyzinae, Milichiinae, Ochthiphilinae, and Geomyzinae. *Journal of the New York Entomological Society*, 21: 243–244.
- Villeneuve J. 1920. *Vichyia acyglossa*, espèce et genre nouveaux de la famille des Milichiidae (Dipt. Muscidae). *Bulletin de la Société Entomologique de France*, 1920: 69–70.
- Xi YQ & Yang D. 2014. *Neophyllomyza* (Diptera: Milichiidae) recorded from China with descriptions of three new species. *Florida Entomologist*, 97: 1640–1647.
- Xi YQ & Yang D. 2017. Milichiidae. In: Yang XK (Ed.), *Insect Fauna of the Qinling Mountains. Vol. 11. Diptera*. World Publishing Corporation, Xi'an, pp. 806–810.
- Xi YQ, Yang D & Yin XM. 2019. Three new species of the genus *Neophyllomyza* Melander (Diptera, Milichiidae) from China, with a revised key to the Chinese species. *ZooKeys*, 867: 123–137.