

Two new species and two newly-recorded species of *Lygephila* Billberg (Lepidoptera: Erebidae) from China

Yu SUN¹, Huilin HAN^{1, 2, 3}✉

1. College of Forestry, Northeast Forestry University, Harbin, Heilongjiang 150040, China

2. Northeast Asia Biodiversity Research Center, Northeast Forestry University, Harbin, Heilongjiang 150040, China

3. Key Laboratory of Sustainable Forest Ecosystem Management, Ministry of Education, Northeast Forestry University, Harbin, Heilongjiang 150040, China

Abstract: Two new species of the genus *Lygephila* Billberg, 1820, *L. taibaishanensis* sp. nov. (Shaanxi) and *L. chengdeensis* sp. nov. (Hebei), are described from China. Two species, *L. vicioides* (Hampson, 1926) (Xizang) and *L. emaculata* (Graeser, 1892) (Heilongjiang) are reported for the first time from China. Illustrations of the adults and genitalia along with their distributional data are provided.

Key words: Noctuoidea; Toxocampinae; taxonomy

中国影夜蛾属二新种和二新记录种记述（鳞翅目：目夜蛾科）

孙钰¹, 韩辉林^{1, 2, 3}✉

1. 东北林业大学林学院, 黑龙江 哈尔滨 150040; 2. 东北林业大学东北亚生物多样性研究中心, 黑龙江 哈尔滨 150040; 3. 东北林业大学森林生态系统可持续经营教育部重点实验室, 黑龙江 哈尔滨 150040

摘要: 记述中国影夜蛾属 2 新种: 太白山影夜蛾 *Lygephila taibaishanensis* sp. nov. (陕西) 和承德影夜蛾 *L. chengdeensis* sp. nov. (河北), 及 2 新记录种: *L. vicioides* (Hampson, 1926) (西藏) 和 *L. emaculata* (Graeser, 1892) (黑龙江), 提供了新种和新记录种的成虫和外生殖器特征图及分布信息。

关键词: 夜蛾总科; 影夜蛾亚科; 分类

Introduction

The genus *Lygephila* belongs to the family Erebidae, which was established by Billberg (1820) based on the type species *Phalaena lusoria* Linnaeus, 1758 from Germany. Up to now, 61 species have been described worldwide, of which 28 species are distributed in China. The first species of this genus in China, *Toxocampa vulcanea* ab. *strigosata*, was described by Warren (1914) from “West China”, which now is synonymized with *L. vulcanea* (Butler, 1881). Since then, new species from China are as follows: *L. alikanga* was found in Taiwan by Strand (1920); *L. violaceogrisea* (Sichuan) and *L. angustissima* (Yunnan) by Draudt (1950); *L. kishidai* and *L. yoshimotoi* from Taiwan by Kinoshita (1989); *L. dubatolovi* (Liaoning) by

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✉ Corresponding author, E-mail: hanhuilin@aliyun.com

Fibiger *et al.* (2008); *L. stueningi* (Yunnan) and *L. longicoecum* (Shanxi) by Kononenko & Fibiger (2008); *L. fibigeri* (Yunnan) by Babics & Stüning (2011); *L. aphroditae* (Yunnan) and *L. vargai* (Yunnan) by Babics (2014); and *L. pallidivena* (Sichuan), *L. froysa* (Shaanxi, Inner Mongolia) and *L. intermedia* (Yunnan) by Pekarsky (2016b). The remaining 13 species were reported by additional research (Chen 1999; Babics 2014; Fibiger *et al.* 2008; Pekarsky 2014; 2016a–c).

Material and methods

Specimens were collected by 220V/450W mercury and DC black light lamps in Heilongjiang, Xizang, Shaanxi and Hebei Provinces. Dissection and preparation of genital sections were performed using standard methods (Kononenko & Han 2007). A Nikon D700 camera was used to photograph specimens. Photos of the genitalia slides were taken using the Olympus Photo microscope, Helicon Focus software and further processed in Adobe Photoshop CS6. All examined specimens are deposited in the collection of Northeast Forestry University (NEFU) in Harbin, China.

Taxonomy

1. *Lygephila taibaishanensis* sp. nov. (Figs 1A, 1B, 3A, 3D)

Description. Adult (Figs 1A, 1B). Wingspan 32–38 mm. Head brownish black; antenna filiform. Thorax cyan brown, mixed with a little red. Abdomen greyish yellow. The ground color of forewing blackish brown, diffused cyan; basal and median lines indistinct; antemedial line slightly indistinct, black, double, very weak; postmedial line excurved, thin, double, slender and a little dark brown; terminal line formed by several short black segments; orbicular spot indistinct; reniform spot irregular oval-shaped, with black dots around it; costa and outer margin areas more deeply dark. Hindwing grey to greyish yellow; vein brown; discal spot a small and brown dot; terminal band brown and broad.

Male genitalia (Fig. 3A). Uncus long, narrow, hook-shaped, pointed apically. Tegumen band-shaped. Vinculum broad V-shaped. Juxta narrow triangle-shaped. Valva rhombus-shaped; sacculus straight and broad, sacculus process elongated, extending to cucullus; costa roundish, smooth arc-shaped, with a large depression at basal part; harpe incurved, finger-shaped, slightly sclerotized, basal plate long and flat. Aedeagus straight tubular-shaped, weakly sclerotized. Vesica membranous, with ten diverticulum, with dense small grains or pricks; subterminal diverticulum I with a short, sclerotized, monk hat-shaped cornutus, subterminal diverticulum II long, straight.

Female genitalia (Fig. 3D). Papillae anales narrow, band shaped. Apophysis posterioris ca. 1.5 the length of apophysis anterioris. Ostium broad and flat; ostium plate large and sclerotized. Ductus bursae sclerotized, flat, spirally bent, and is ca. 1/2 the length of corpus bursae. Corpus bursae long oval-shaped, gradually narrowing anteriorly, with a sclerotized signum at posterior part; appendix bursae incurved cone-shaped.

Holotype. ♂, China, Shaanxi, Mount Taibai, Meixian County, Haopingsi, 02–10-V-2010, leg. TY SHAO & XW LIU, gen. prep. no. hhl-2645-1. **Paratypes.** 1♂1♀, same data as

holotype; 1♀, **China**, Shaanxi, Mount Taibai, Foping County, 11–23-V-2010, leg. TY SHAO & XW LIU, gen. prep. no. hhl-2644-2.

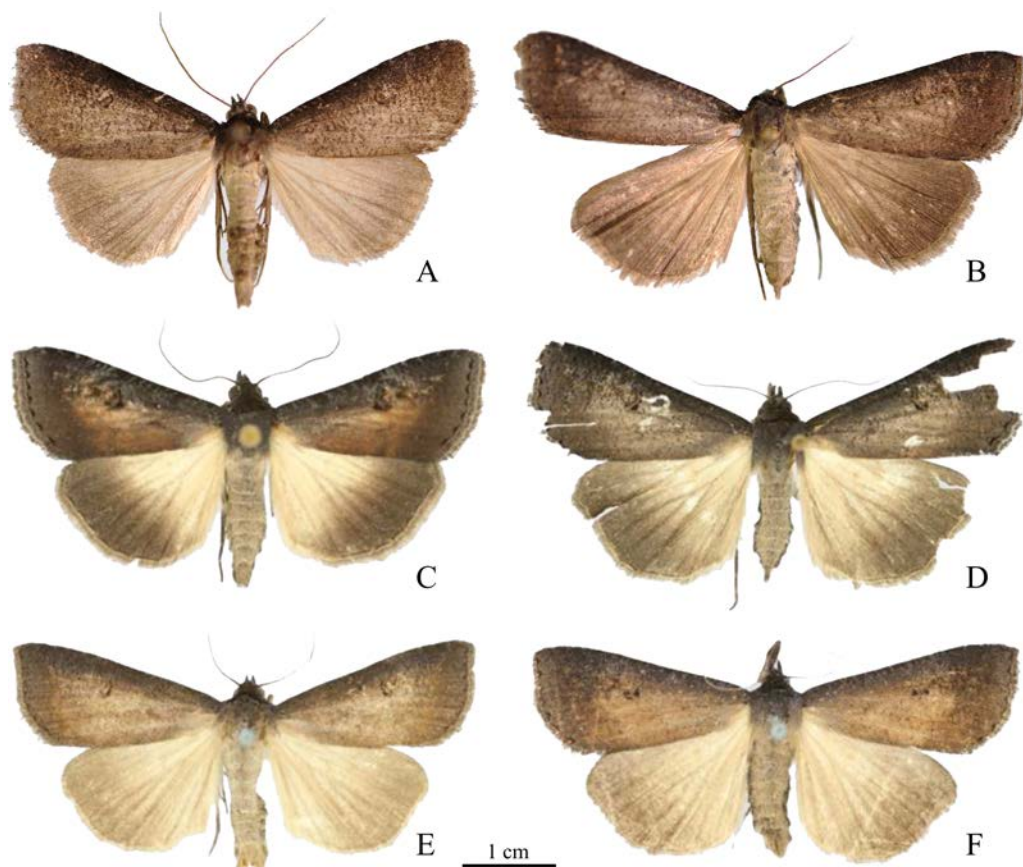


Figure 1. Adults of *Lygephila* spp. A. *L. taibaishanensis* **sp. nov.**, holotype; B. *L. taibaishanensis* **sp. nov.**, paratype; C, D. *L. intermedia* (after Pekarsky *et al.* 2016); E, F. *L. nigricostata* (after Pekarsky *et al.* 2016). A, C, E. ♂; B, D, F. ♀.

Etymology. The species epithet is based on the locality where the type specimen was collected.

Remarks. This new species is externally similar to *L. intermedia* Pekarsky, 2016 (Figs 1C, 1D) and *L. nigricostata* (Graeser, 1890) (Figs 1E, 1F). Differences are as follows (characteristics of contrasting species in brackets): the ground colour of forewing is unicolorous blackish-brown (*L. intermedia* and *L. nigricostata* more mixed yellow); reniform spot eye-shaped (*L. intermedia* and *L. nigricostata* oval-shaped); hindwing grey to greyish yellow (*L. intermedia* and *L. nigricostata* light whitish yellow). In male genitalia, the branch of vinculum short, rather sharp apically (*L. intermedia* (Fig. 3B) long band-shaped; *L. nigricostata* (Fig. 3C) broad knife point-shaped); costal margin smooth and big arc-shaped (*L. intermedia* and *L. nigricostata* unsmooth and thinly arc-shaped); harpe thin sclerotized, medium coarseness (*L. intermedia* sclerotized, incurved and narrow at middle; *L. nigricostata* sclerotized, straight); cornutus monk hat-shaped (*L. intermedia* point-shaped; *L. nigricostata*

cone-shaped); subterminal diverticulum II straight (*L. intermedia* and *L. nigricostata* with curve at basal part). In female genitalia, ductus bursae strongly spiral bending (*L. intermedia* (Fig. 3E) and *L. nigricostata* (Fig. 3F) rather thin); signum straight narrow band-shaped (*L. intermedia* and *L. nigricostata* not straight, rather broader than new species); junctional plate of ductus and corpus bursae broader, thinner sclerotized (*L. intermedia* common; *L. nigricostata* strongly sclerotized, big dot-shaped).

2. *Lygephila chengdeensis* sp. nov. (Figs 2A, 2B, 4A, 4C)

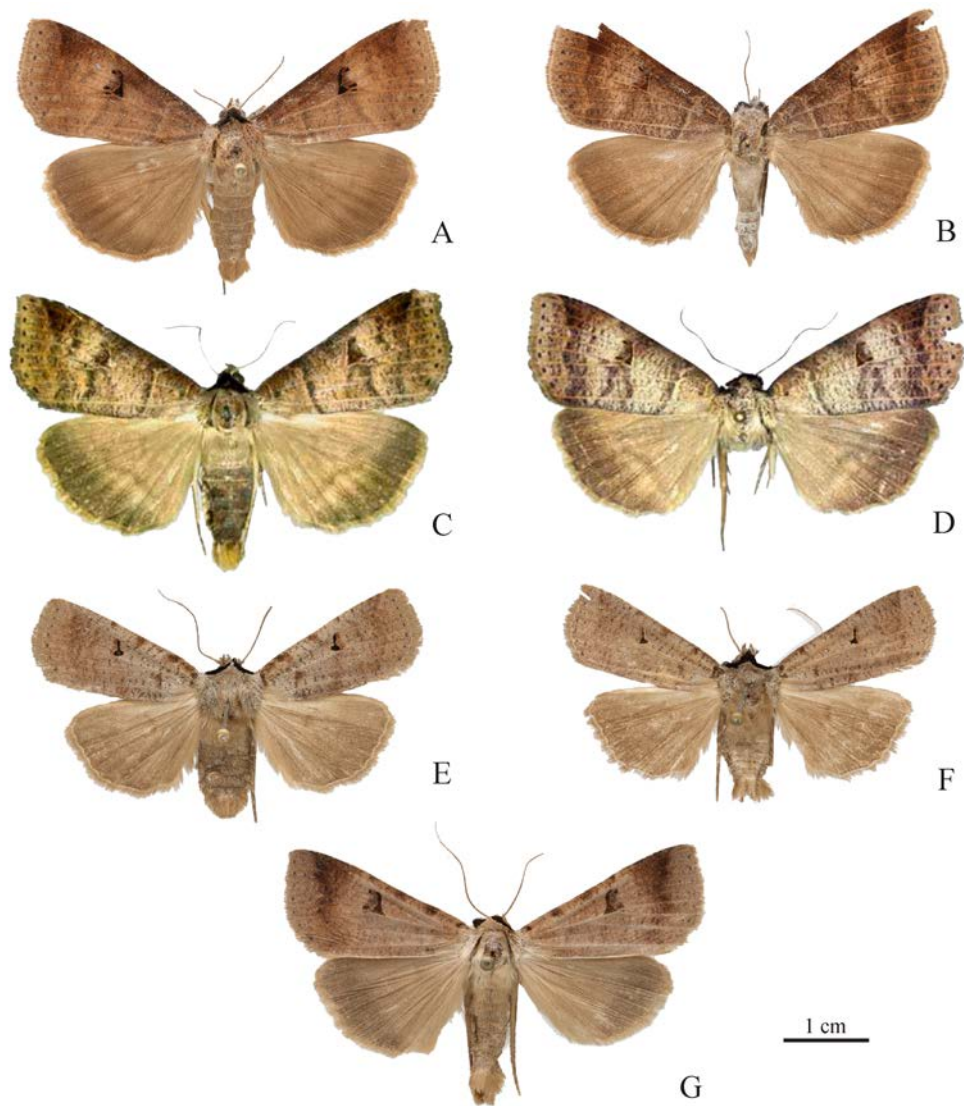


Figure 2. Adults of *Lygephila* spp. A. *L. chengdeensis* sp. nov., holotype; B. *L. chengdeensis* sp. nov., paratype; C, D. *L. dubatolovi* (after Fibiger et al. 2008); E, F. *L. vicioides*; G. *L. emaculata*. A, C, E, G. ♂; B, D, F. ♀.

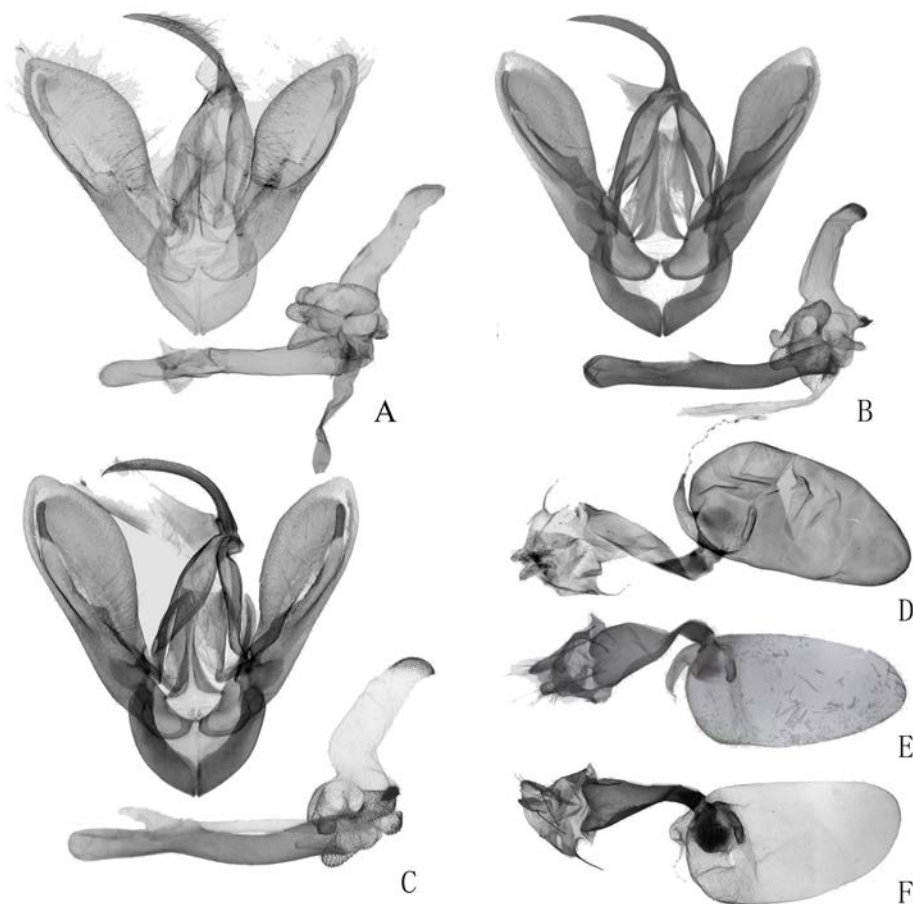


Figure 3. Genitalia of *Lygephila* spp. A. *L. taibaishanensis* **sp. nov.**, holotype, genit. prep. no. hhl-2645-1; B, E. *L. intermedia* (after Pekarsky 2016c); C, F. *L. nigricostata* (after Pekarsky 2016c); D. *L. taibaishanensis* **sp. nov.**, paratype, genit. prep. no. hhl-2644-2. A–C. ♂; D–F. ♀.

Description. Adult (Figs 2A, 2B). Sexual dimorphism very obvious. Wingspan 40–45 mm. Head brownish grey, mixed white; antennae filiform. Thorax reddish brown; patagium dark black. Abdomen reddish brown, mixed with grey in some specimens. The ground color of forewing reddish brown, diffused with a little gray, and dark brown; basal line short, thin grey; antemedial line grey, excurved on costal margin area, then oblique to inner margin; median line smoky brown, indistinct, weakly wavy; postmedial line grey, excurved before Cu_1 , then incurved to inner margin; subterminal line thin reddish grey or grey, and slightly inward oblique, weakly wavy; terminal line formed by a series of small, brown dots between two veins; orbicular spot round, little darker than ground colour; reniform spot big, oval-shaped, with a black vertical “—” on the inner part of internal line; postmedial and terminal line regions rather thinner than others; venations reddish grey in female, dim in male. Hindwing reddish brown, terminal band broad, and dark brown; fringe reddish brown; discal spot indistinct, thin incurved arc-shaped; terminal line yellow.

Male genitalia (Fig. 4A). Uncus machete-shaped, swollen near top, pointed apically.

Tegumen a narrow band. Vinculum U-shaped. Juxta flame-shaped. Valva straightly knife-shaped; sacculus broad, oblong, band-shaped, sacculus process narrow, extends to cucullus; costa with a large depression at basal part; harpe strongly sclerotized, straight, narrow, cone-shaped, insert at 1/3 of proximal part, the basal plate of harpe long, narrow groove-shaped. Aedeagus straightly tubular-shaped, sclerotized; carina and ventral side covered with a lot of small grains; caecum short, ca. 1/9 the length of aedeagus. Vesica membranous, with five middle diverticula, with densely small grains or pricks; the one basal diverticulum irregular vesicle-shaped.

Female genitalia (Fig. 4C). Papillae anales broad, flat. Apophysis anterioris rather wider than apophysis posterioris, and ca. 2/3 the length of the later. Ostium broad, flat; ostium plate sclerotized. Ductus bursae strongly sclerotized, gradually tapering from posterior to anterior part, about ca. 4/5 the length of corpus bursae. Corpus bursae membranous, long oval-shaped, with some longitudinal fold.

Holotype. ♂, **China**, Hebei, Chengde City, Dengshang Town, Shihai Forest Park, 04-VII-2022, leg. HY LIU, genit. prep. no. sy-127-1. **Paratypes.** 2♀, same data as holotype, genit. prep. no. sy-122-2, sy-123-2.

Etmymology. The species epithet is based on the locality where the type specimen was collected.

Remarks. This new species is externally similar to *L. dubatolovi* Fibiger, Kononenko & Nilsson, 2008 (Figs 2C, 2D). Differences are as follows (characteristics of contrasting species in brackets): the wingspan 40–45 mm (*L. dubatolovi* 44–47 mm); the ground colour of forewing is rather redder (*L. dubatolovi* rather greyer); crossing lines slightly indistinct and slender (*L. dubatolovi* distinct and broader). In male genitalia (Fig. 4B), the tegumen rather slender (*L. dubatolovi* rather thicker); the basal plate of harp rather broad, groove-shaped (*L. dubatolovi* very slender line-shaped); harp long (*L. dubatolovi* short); valva straight knife-shaped (*L. dubatolovi* willow leaf-shaped). In female genitalia (Fig. 4D), apophysis anterioris 2/3 long as posterioris (*L. dubatolovi* apophysis equally long); corpus bursae long oval-shaped (*L. dubatolovi* pear-shaped).

3. *Lygephila vicioides* (Hampson, 1926) (Figs 2E, 2F, 4E, 4F)

Asticta vicioides Hampson, 1926: 148. Type species: *Asticta vicioides* Hampson, 1926. Type locality: Kulu, Sultanpur.

Lygephila robusta Babics & Ronkay, 2009: 175. TL: Nepal, Ganesh Himal, 2520 m, near Godlang, 85°17E, 28°10N.

Lygephila vicioides: Pekarsky, 2018: 48.

Specimens examined. 1♂, **China**, Aut. Reg. Xizang, Rikaze City, Jilong Town, Chongse Village, 17-V-2021, legs. J WU & JJ FAN, genit. prep. no. sy-61-1; 2♀, **China**, Aut. Reg. Xizang, Rikaze City, Jilong Town, Rema Village, 14-V-2021, legs. J WU & JJ FAN, genit. prep. no. sy-58-2, sy-59-2; 1♀, **China**, Aut. Reg. Xizang, Linzhi City, Bayi District, 22–23-V-2021, legs. J WU & JJ FAN, genit. prep. no. sy-60-2.

Distribution. China (Xizang); India; Nepal; Pakistan.

4. *Lygephila emaculata* (Graeser, 1892) (Figs 2G, 4G)

Toxocampa emaculata Graeser, 1892: 231. Type species: *Toxocampa emaculata* Graeser, 1892. Type locality: Ussuri, Koslofska.

Lygephila emaculata: Poole, 1989: 610; Leley, 2016: 398.

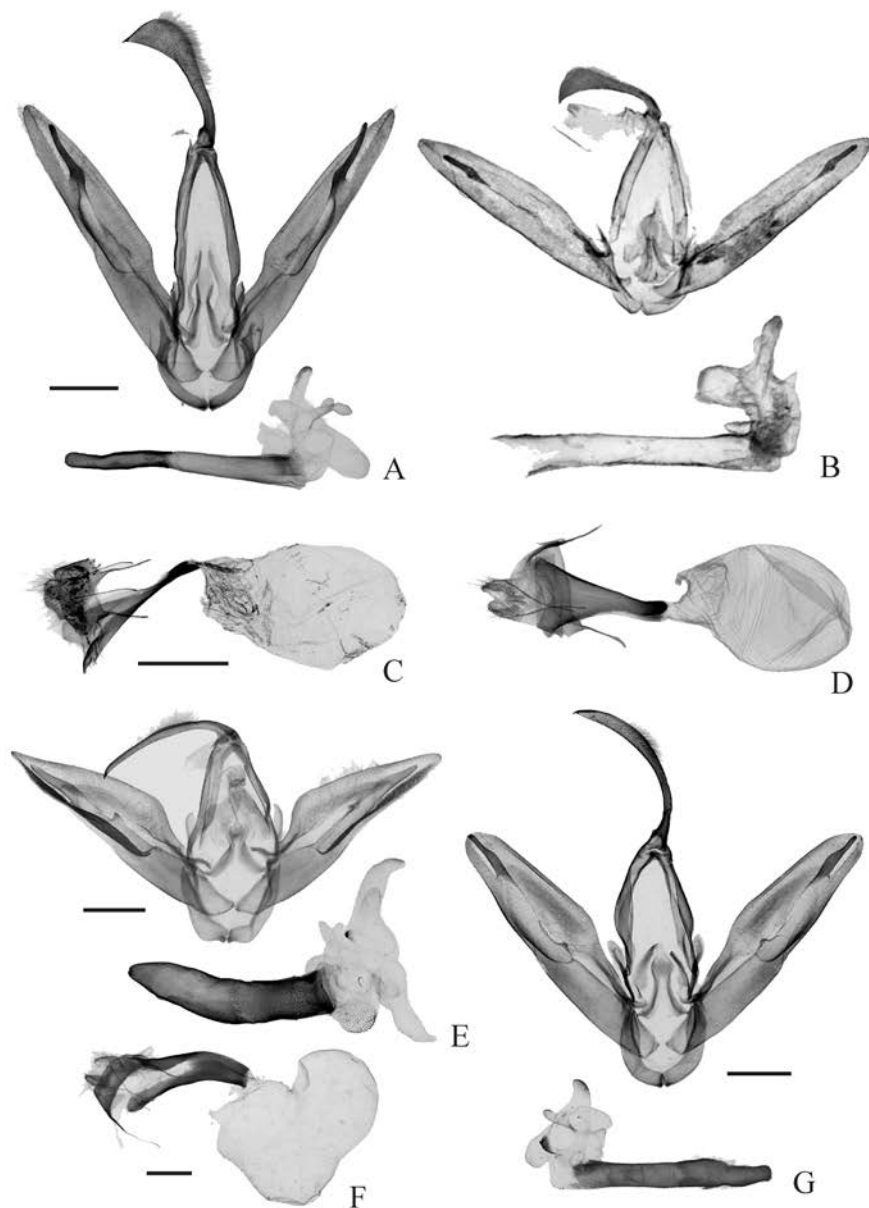


Figure 4. Genitalia of *Lygephila* spp. A. *L. chengdeensis* **sp. nov.**, holotype, genit. prep. no. sy-123-1; B. *L. dubatolovi* (after Fibiger *et al.* 2008); C. *L. chengdeensis* **sp. nov.**, paratype, genit. prep. no. sy-127-2; D. *L. dubatolovi* (after Fibiger *et al.* 2008); E. *L. vicioides*, genit. prep. no. sy-61-1; F. *L. vicioides*, genit. prep. no. sy-60-2; G. *L. emaculata*, genit. prep. no. sy-48-1. A, B, E, G. ♂; C, D, F. ♀. Scale bars = 1 mm.

Specimen examined. 1♂, **China**, Heilongjiang, Fuyuan City, Sanjiang Natural Reserve, 15–16-VII-2022, legs. HL HAN, TT ZHAO & MX HAN, genit. prep. no. sy-48-1.

Distribution. China (Heilongjiang); Russian Far East.

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