

SPECIES-GROUPS WITHIN THE GENUS *LIMNOPHORA* R.-D. (DIPTERA: MUSCIDAE) AND DESCRIPTIONS OF NEW SPECIES

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Abstract This paper divides the genus *Limnophora* R.-D. into five species-groups, namely *L. triangularis*-gr., *L. spoliata*-gr., *L. exigua*-gr., *L. nigripes*-gr. and *L. scrupulosa*-gr. A key to each group is provided and three new species from Yunnan Province, *L. longispatula* sp. nov., *L. yulongxueshanna* sp. nov. and *L. yunnanensis* sp. nov., described. Type specimens are deposited in the Institute of Entomology, Shenyang Normal University.

Key words Diptera, Muscidae, *Limnophora*, species-group, new species

INTRODUCTION

Limnophora was established by Robineau-Desvoidy in 1830 with *L. palustris* as the type species. With the exception of New Zealand, this genus has a worldwide distribution. It can be distinguished from the other Muscidae genera of Muscidae by the sides of the prothorax basisternum being setulose, node of Rs with setulae on dorsal and ventral surfaces, abdominal tergites 3 and 4 with a pair of subtriangular brownish black lateral spots. *Limnophora* R.-D. contains about 220 species, in which 59 are distributed in the Palaearctic region, and 48 species in the Oriental region. The genus *Limnophora* R.-D. is abundant in China with 52 species recorded.

This paper divides the genus into five species-groups, and reported three new species.

Key to Chinese species-groups of *Limnophora*

- 1 (4) Post dc 3
- 2 (3) Frons at least 1/4 of head width; with one to two distinctly orbital setae *L. triangularis*-gr.
- 3 (2) Frons at most 1/7 of head width; orbital setae indistinct *L. spoliata*-gr.
- 4 (1) Post dc 4
- 5 (6) presutural area of scutum with two adjacent large brown-black spots; anterior half of postsutural scutum with brown-black transverse band *L. exigua*-gr.
- 6 (5) Anterior half part of postsutural scutum without brown-black transverse band

- 7 (8) Frons more than 1/4 of head width (or at least 3.5 times of the width of antennal flagellomere) *L. nigripes*-gr.
- 8 (7) Frons less than 1/6 of head width (or at most 2.5 times of the width of antennal flagellomere) *L. scrupulosa*-gr.

2 DESCRIPTIONS OF NEW TAXA

Limnophora longispatula sp. nov. (Fig. 1)

Etymology: this species name is derived from Latin (*spatul* = spoon) and refers to its long spoon-shaped surstyli.

Length of body 4.2 - 4.9 mm. Head: Eyes bare; frons about 1/9 of head width (wider than or equal to the distance between outer margin of posterior ocelli), frontal vitta black, about 2.0 - 2.5 times as wide as fronto-orbital plate, frontal setae 6 (a few 5 or 7), orbital setae 2 (rarely 1), fronto-orbital plates, parafacials, genal groove, and genae with brownish gray pollen, parafacial about 2/3 the width of antennal flagellomere; antennae black, flagellomere about 2.5 times as long as broad, arista short ciliated, the longest hairs about equal to the diameter of arisal base; genal height about 1/6 of eye height, vibrissal angle slightly protruding, or almost at the same vertical line with frontal angle; proboscis black, prementum bright, 3 times as long as height, palpi black and slender, longer than haustellum.

Thorax: Ground color black, with heavy

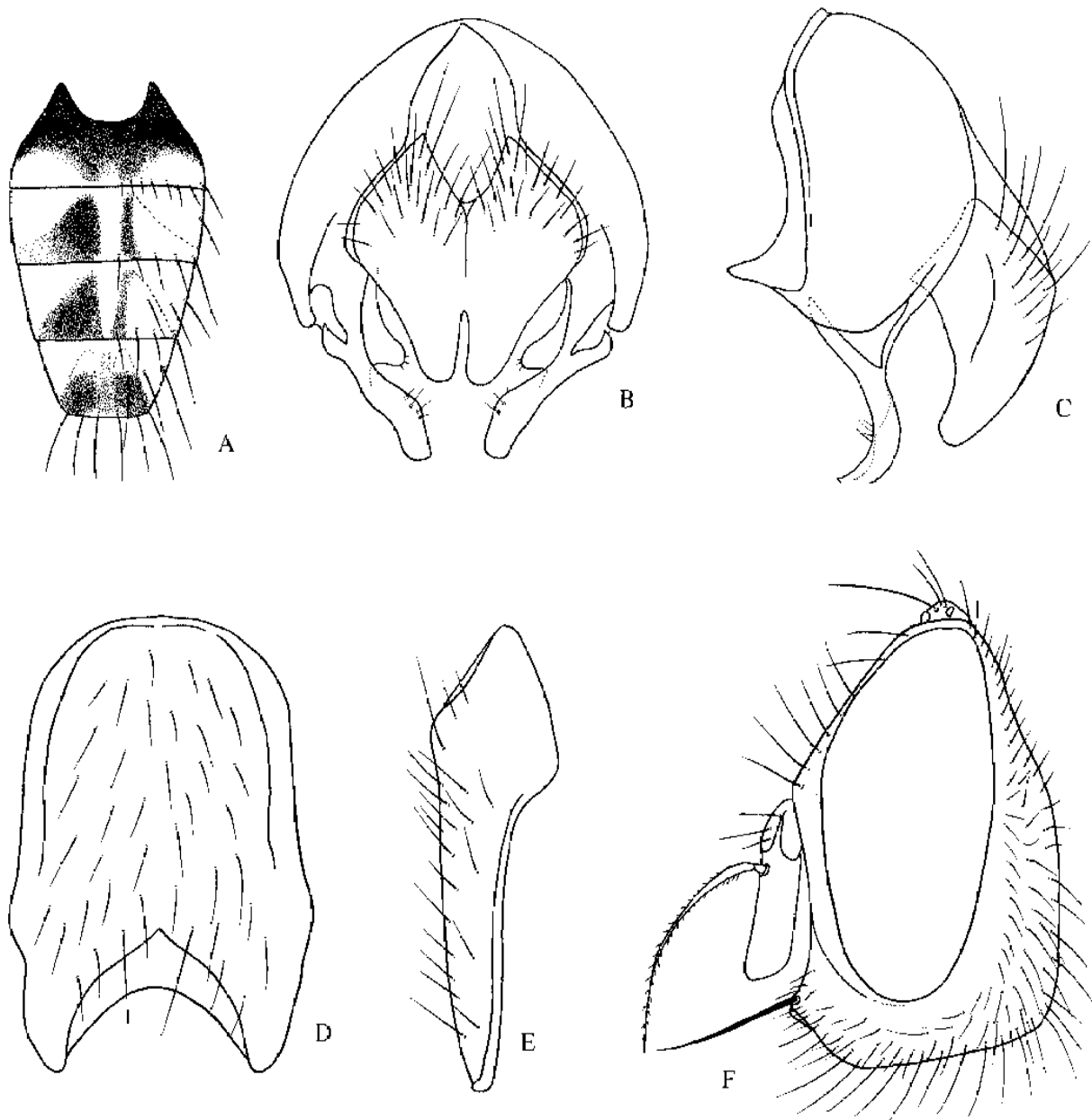


Fig. 1 *Limmophora longispatula* sp. nov. .
 A. abdomen in dorsal view; B. terminalia in posterior view; C. terminalia in profile;
 D. 5th sternite in ventral view; E. 5th sternite in profile; F. head in profile.

brown pollen, along *dc* rows with obscure black stripes, the median stripe moderately broad, reaching to scutoscuteellar suture, presutural *acr* 3 - 4 rows, *dc* 2 + 3, *ia* 1 + 3, notopleura bare, upper anterior anepisternal bristle 1, disc of propleuron, anepimeron, meron and katepimeron bare, spiracle dark brown, katepisternal bristles 1 - 2. Wings brownish, tinged brown at basalbase, basicosta

black, costal spine short and small, veins R_{4+5} and M nearly parallel on apical part, calypters brown, halteres yellow. Legs black, fore tibia without median *p*; mid femur with a row of *a* in basal 2/3, 2 apical *pd*, 3 - 4 strong *pv* in basal half, mid tibia with 1 median *p*; hind femur with 2 - 3 moderately strong *av* on apex, without *pv*, with a row of *p* in basal 1/3, hind tibia with 1 submedian *av* and 1

median *p*; tarsi longer than tibiae, claws and pulvilli normal.

Abdomen: Ground color black, ovate-shaped, with densely grayish yellow pollen, 3rd and 4th tergites each with a pair of sub-triangular black spots, 5th tergite with unstable spots, some with medial light pollinose stripe, the spots can be distinctly divided into two parts, some with obscure spots, some without spots; 1st sternite bare.

Unknown.

Holotype, Yizhongshan, 3350m, Zhongdian county, Yunnan Province, May 20, 2001, collected by TONG Yan-feng; paratype 62

, same data as holotype, 6, Yilacaoyuan, 3380m, Zhongdian county, Yunnan Province, the collector and collection time same as the previous, 100, the locality same as for holotype, 3300 - 3420m, May 19, 2001, collected by ZHENGLi-jun, 4, Mt. Luquanxueshan, 2700m, Yunnan Province, June 1, 2000, collected by LI Fu-hua, 2, Luoji, 3300m, Zhongdian county, Yunnan Province, August 1, 2001, collected by LI Fu-hua, 1, Bitahai, 3540m, Zhongdian county, Yunnan Province, August 9, 2001, collected by LI Fu-hua.

This new species belong to *L. spoliata* group, resembles *L. purgata* Xue, 1992, but it differs from the latter in having frons about equal to 1/9 of head width (wider than or equal to the distance between outer margin of posterior ocelli), fronto-orbital plates, parafacials, genal groove, and genae with brownish gray pollen, mesonotum with heavy brown pollen, calypters brown, cerci smoothly at outer margin in posterior view, surstyli long spoon-shaped on apex, the lobe of 5th sternite narrow on apical part in profile. Frons of the latter about equal to 1/15 of head width, fronto-orbital plates, parafacials, genal groove, and genae with silver white pollen, mesonotum with gray pollen, calypters yellowish, cerci concave at outer margin in posterior view, the apex of surstyli round spoon-shaped, the lobe of 5th sternite is rather broad on apical part in lateral view.

Limnophora yulongxueshanna sp. nov. (Fig. 2)

Etymology: the specific name refers to the collection locality of the type species.

Length of body 2.8 mm. Head: Eyes bare; frons about 4/7 of head width, frontal vitta with dense grayish white pollen, and about 8 times as wide as fronto-orbital plate, inclinate frontal setae 3, reclinate orbital setae 2, fronto-orbital plate, parafacialia and genae with grayish white pollen, fronto-orbital plate about 2/5 the width of antennal flagellomere; antennae black, moderately broad and large, flagellomere about twice as long as broad, arista short ciliated, longest hairs about as long as the diameter of arista base, the thickened part of arista about 1/5 of its length; lower facial margin not protruding, vibrissal angle situated behind frontal angle, genal height about 1/7 of eye height; proboscis black, prementum bright, about 2.5 times as long as height, palpi black, longer than prementum.

Thorax: Ground color black, mesonotum mostly with brown pollen, postpronotal lobes, notopleura and pleura with dark gray pruinosity, without distinct vittae, the median stripe not reaching to scutoscuteellar suture, the scutellum with dark brown patches on lateral sides of the basal part, and with grayish yellow pollen on discal area until apical part, presutural *acr* hairs-like in 2 rows, *dc* 2 + 3, *ia* 0 + 2, *pra* absent, notopleura without hair, with 1 upper anterior anepisternal bristle, anepimeron, meron and katepimeron bare, spiracle small, brown, katepisternal bristles 1-2. Wings hyaline, basicosta black, costal spine indistinct, node of Rs with hairs on both surfaces, veins R_{4+5} and M straight on apical part; calypters yellowish, halteres yellow. Legs wholly black, fore tibia without median *p*; mid femur with a row of *a* setulae in basal half, 2 *pd* on apex, 2 *pv* on basal part, mid tibia with 1-2 median *p*; hind femur with 2-3 *av* on basal 1/3, without *pv*, hind tibia with 1 submedian *av*, 1 median *ad*; the tarsi each longer than tibiae, claws and pulvilli short and small.

Abdomen: Ground color black, ovate-shaped, with grayish pollen, 3rd and 4th tergites with a pair of moderately large ladder-shaped dark brown spots

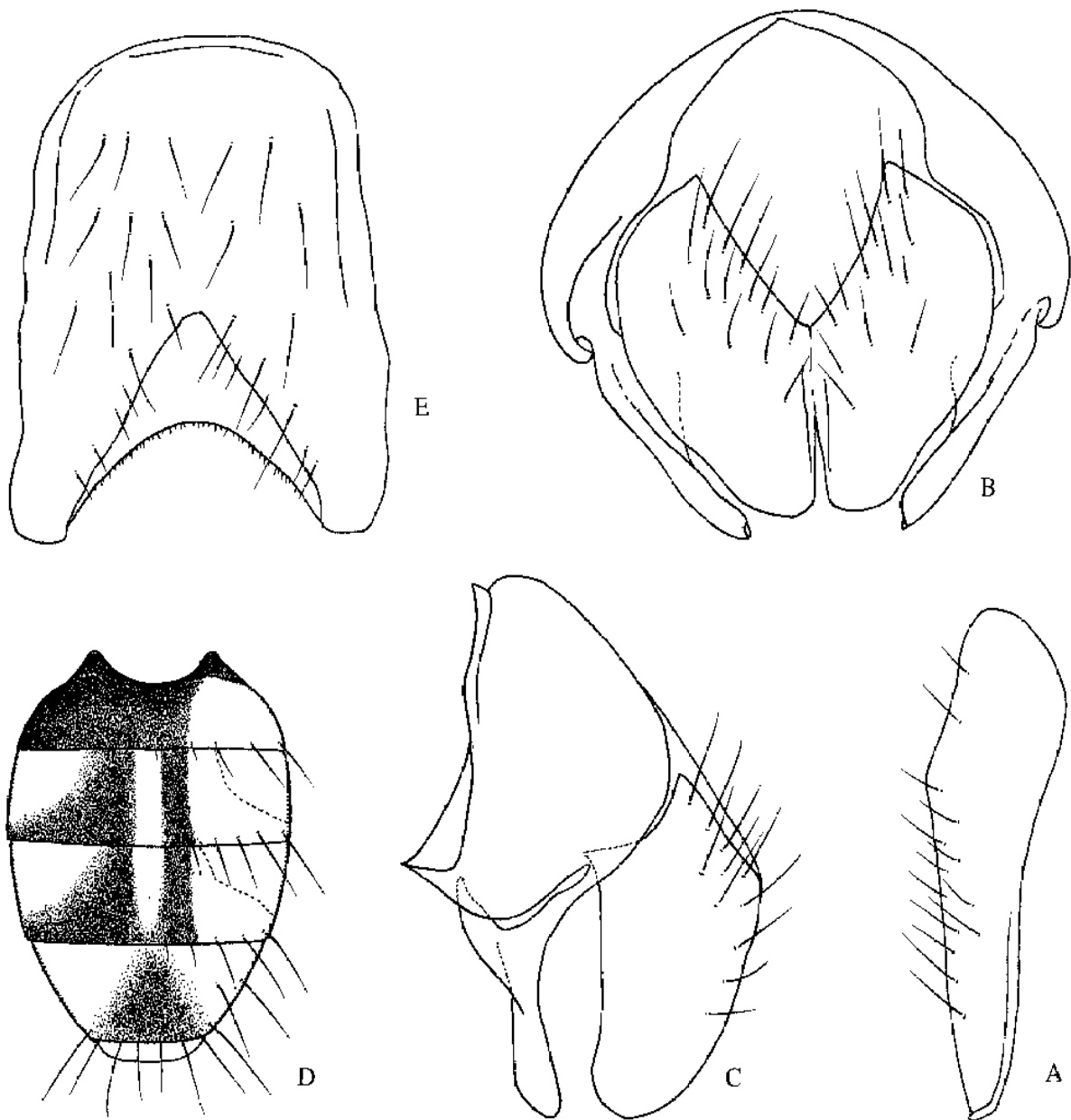


Fig. 2 *Limnophora yulongxueshanna* sp. nov. , .

A. 5th sternite in profile ; B. terminalia in posterior view ; C. terminalia in profile ; D. abdomen in dorsal view ;
E. 5th sternite in ventral view.

respectively, 5th tergite with a brownish sub-triangular spot on middle; 1st sternite bare.

Unknown.

Holotype , Spruce lawn, 3210 m, Mt. Yulongxueshan, Yunnan Province, May 15, 2001, collected by ZHENG Li-jun; paratype 1 , same data as holotype.

This new species belong to the *L. trangular*

group and, is similar to *L. argentifrons* Shinonaga et Kano, 1977 found in the Amami and Ryukyu Islands of Japan, but it differs from the latter in having broad frons (about 4/7 of head width), eyes bare, frontal setae 3, calypters yellowish, the spots on 4th tergite reaching to anterior margin, etc. The latter frons about 0.45 of head width, eyes with microscopic hairs, frontal setae 2, calypters white,

the spots on 4th tergite not reaching to anterior margin.

Limnophora yunnanensis sp. nov. (Fig. 3)

Etymology: the root “*yunnan*” of the name of the species is the name of the Province in which the type locality was found.

Body length 4.2 mm. Head: Eyes bare;

frons about as wide as the distance between outer margin of posterior ocelli, frontal vitta black, about 2.5 times as wide as fronto-orbital plate, frontal setae about 5, proclinate orbital setae 3(2), fronto-orbital plate, parafacilia with gray pollen, parafacilia narrow, about 1/3 width of antennal flagellomere; antennae black, flagellomere about 2.5 times as long as broad, arista pubescent, the long

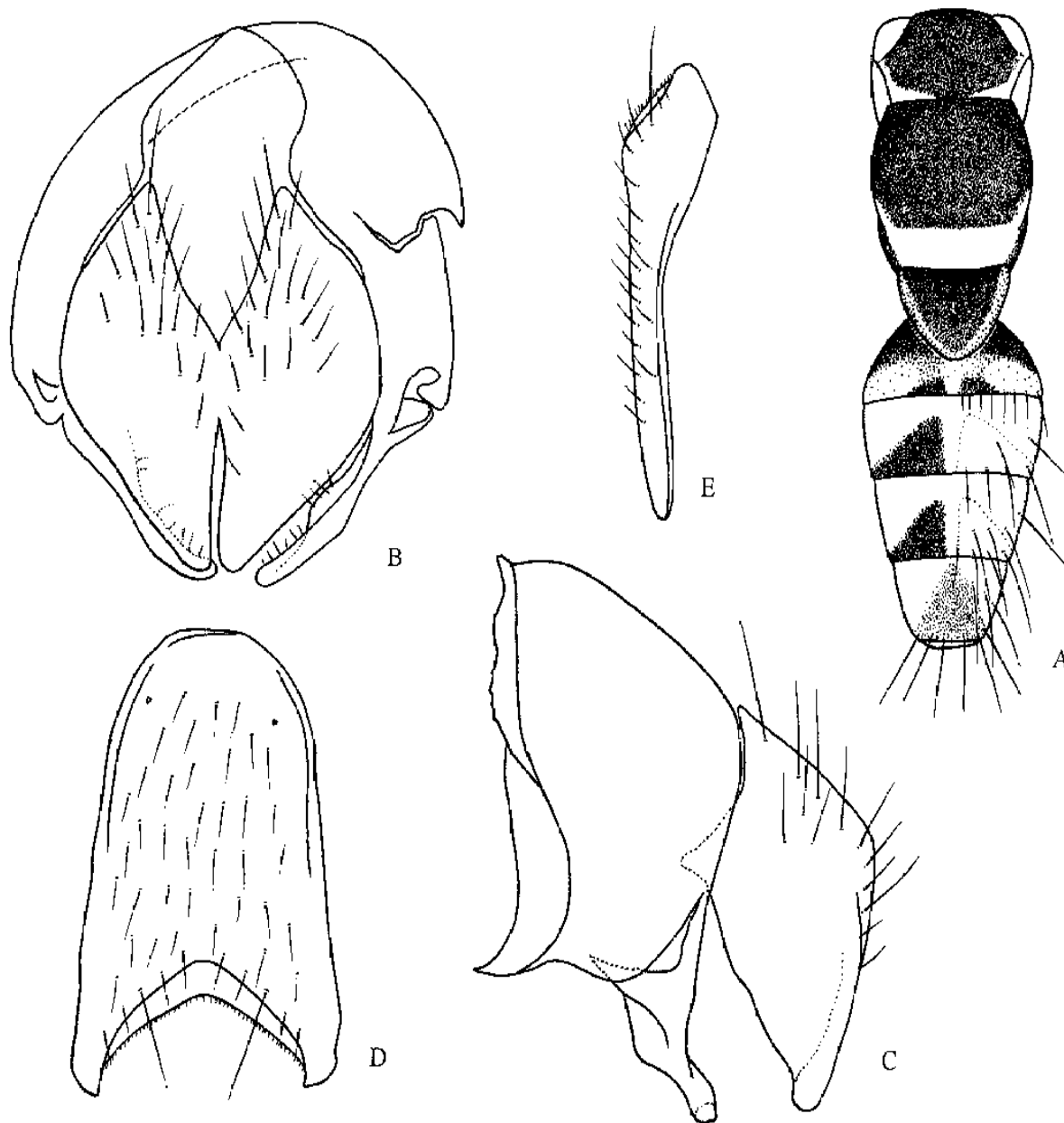


Fig. 3 *Limnophora yunnanensis* sp. nov. , .

A. Thorax and abdomen in dorsal view; B. terminalia in posterior view; C. terminalia in profile; D. 5th sternite in ventral view; E. 5th sternite in profile.

est hairs shorter than the diameter of arista base; frontal angle projecting forward in front of vibrissal angle in profile, lower facial margin not protruding, genae with gray pollen, about 1/7 of eye height, upper part of paracephalon with hairs; proboscis black, prementum polished, about 3.5 times as long as height, palpi black, about equal to prementum in length.

Thorax: Ground color black, mesonotum mostly with brown pollen, only postpronotal lobes, notopleura, the anterior two sides of transverse suture and the area in front of scutoscuteellar suture with grayish yellow pollen, without distinct stripe, scutellum mostly brown and with thin gray pollen on lateral lower margin of apical part, presutural *acr* hairs-like in regular 4 rows, *dc* 2 + 3, *ia* 0 + 2, *h* 2, *ph* 1 + 0, and with 1 hair-like *pra*, notopleura without hair, pleura with gray pollen, anepimeron, meron and katepimeron bare, upper anterior anepisternal bristle 1, katepisternal bristles 1-2. Wings brownish, veins brown, basicosta black brown, costal spine small, veins R_{4+5} and M nearly parallel on apical part, R_{4+5} veins with setulae rows on both surfaces, the dorsal row exceeds crossvein *r-m*, its length about 1/2 the distance from node of *Rs* to tip of vein R_{4+5} , the ventral row only extending 1/2 distance from node of *Rs* to crossvein *r-m*; calypters brownish, halteres yellow. Legs wholly black, fore tibia without median *p*; mid femur with a row of *a* setulae, 2 apical *pd*, mid tibia with 1 supermedian *p*; hind femur with 3 - 4 *av* on apical 1/3, without *pv*, hind tibia with 1 submedian *av*, 1 median *ad*; the tarsi each longer than tibiae, claws and pulvilli short and small.

Abdomen: Ground color black, cone-shaped, with heavy gray pollen, 1 + 2 sytergite with a pair of obscure black spots on posterior area, 3rd and 4th tergites each with a pair of subtriangular brownish black spots, both not reaching to anterior margin, 5th tergite with a brownish triangular median spot; 1st sternite bare.

Unknown.

Holotype, Jinchanghe, 2000 - 2100 m, Mt. Gaoligongshan, Yunnan Province, May 2, 2001, collected by ZHENGLi-jun; paratype 1, Baihualing, 1250 - 1350 m, Mt. Gaoligongshan, Yunnan Province, May 3, 2001, collector same as holotype.

This new species belongs to *L. spoliata* group, is closely related to *L. ryukyuensis* Shinonaga et Kano, 1977, but differs from the latter in having frons equal to the distance between outer margin of posterior ocelli, *ia* 0 + 2, vein R_{4+5} with setulae rows on both surfaces, the dorsal row exceeds crossvein *r-m*, 1 + 2 sytergite with a pair of obscure black spots on posterior area.

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References

- Fan, Z. D. 1992 Key to the Common Flies of China (Second ed.). Beijing: Science Press. 355-367. (in Chinese with English summary).
- Feng, Y., Z. D. Fan and W. Zh. Zeng 1999 Three new species of Calypterae from Sichuan, China (Diptera: Arthomyiidae, Muscidae). *Chin Vector Bio & Control* **10**(5):321-324.
- Feng, Y. 2001 A new species and a new record of the genus *Limnophora* from Sichuan, China (Diptera: Muscidae). *Acta Zootaxon. Sin.* **26**(4):580-582.
- Hennig, W. 1959-63 Muscidae. In: Die Fliegen der palaearktischen Region, (ed. Lindner, E.) **7**(2):367-384.
- Shinonaga, S. and R. Kano 1977 Six new species of the genus *Limnophora* R.-D. from the Amami and the Ryukyu Islands. *Jpn. J. Sanit. Zool.* **28**(2):114-118.
- van Emden, F. I. 1965 Fauna of India, Diptera, Muscidae. Calcutta, India: Baptist Mission Press. **7**(1):554-604.
- Xue, W. Q. and C. M. Chao 1996 Flies of China. Shenyang: Liaoning Science and Technology Press. 952-980. (in Chinese with English summary).
- Zhang, Ch. T. and W. Q. Xue 1996 Faunistic studies on the genus *Limnophora* in China (Diptera: Muscidae). *Entomol Sin.* **3**(3):189-204.

中国池蝇属(双翅目:蝇科)分种团研究及三新种记述

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根据池蝇属雄性成虫的额宽、上眶鬃及后背中鬃等特征,将中国池蝇属 *Limnophora* R.-D. 分为 5 个种团,即三角池蝇种团 *L. triangular-gr.*、掠池蝇种团 *L. spoliata-gr.*、斑板池蝇种团 *L. exigua-gr.*、黑池蝇种团 *L. nigripes-gr.* 和锐池蝇种团 *L. scrupulosa-gr.* 等。编制了池蝇属分种团检索表。记述了采自云南省蝇科池蝇属的三新种,即: 分布于云南中甸的长匙池蝇 *L. longispatula* sp. nov., 该种隶属于掠池蝇种团 *L. spoliata-gr.*, 近似于该种团的净池蝇 *L. purgata* Xue, 1992, 但新种雄额宽约为头宽的 $1/9$ (大于或等于后方单眼外缘间距), 侧额、侧颜、下侧颜及颊具棕灰色粉被, 胸具浓密的棕褐色粉被, 腋瓣棕色, 肛尾叶后面观其端部较平滑, 侧尾叶端部长匙状, 第五腹板侧叶侧面观端部较尖等不同。而后者雄额宽约为头宽的 $1/15$, 侧额、侧颜具银白色粉被, 胸部粉被灰色, 腋瓣淡黄色, 肛尾叶后面观外缘波曲, 侧尾叶端部圆匙状, 第五腹板侧面观其端部较圆。 分布于云南玉龙雪山的玉龙雪山池蝇 *L. yulongxueshanna* sp. nov., 该种隶属于三角池蝇种团 *L. triangular-gr.*, 近似于银额池蝇 *L. argentifrons* Shinonaga et Kano, 1977, 但新种雄额宽为头宽的 $4/7$, 复眼裸, 下眶鬃 3, 腋瓣淡黄色, 腹部第四背板的斑达前缘; 而后者雄额宽率为 0.45, 复眼具微毛, 下眶鬃 2, 腋瓣白色, 腹部第四背板的斑不达前缘等不同。 分布于云南高黎贡山的云南池蝇 *L. yunnanensis* sp. nov., 该种隶属于掠池蝇种团 *L. spoliata-gr.*, 近似于硫球池蝇 *L. ryukyuensis* Shinonaga et Kano, 1977, 可据下列特征与后者相区别: 新种额宽约等于后单眼外缘间距, 翅内鬃 $0+2$, R_{4+5} 脉背面小刚毛列超过 $r-m$ 横脉, 第 $1+2$ 合背板后缘具一对不明显的黑斑。模式标本保存于沈阳师范大学昆虫研究所。

关键词 双翅目 蝇科 池蝇属 种团 新种

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