

A new *Libnotes* (*Laosa*) crane fly (Diptera: Limoniidae) from China with a key to Chinese species

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Abstract: The subgenus *Laosa* Edwards, 1926 is a small group within the genus *Libnotes* Westwood, 1876 with 21 species known worldwide. Here, one new *Laosa* crane fly from China, *L. (L.) chikunyangi* sp. nov., is described and illustrated as new to science, increasing the number of Chinese *Laosa* species to six. This new species can be distinguished from congeners by its body color, wing pattern and venation. A key to all Chinese *Laosa* species is presented.

Key words: crane flies; Limoniinae; *Libnotes*; taxonomy

老挝亮大蚊亚属中国一新种及分种检索表（双翅目：沼大蚊科）

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摘要: 老挝亮大蚊亚属是亮大蚊属中的较小类群, 世界仅知 21 种。本研究记述采自中国的该亚属 1 新种——杨氏亮大蚊, 将该亚属在中国的种类增加至 6 种。新种可以通过体色、翅斑和翅脉的特征与近似种区分。本研究还提供了老挝亮大蚊亚属所有中国种类的分种检索表。

关键词: 大蚊; 沼大蚊亚科; 亮大蚊属; 分类

Introduction

Libnotes Westwood, 1876 is a large genus of 294 described species in the family Limoniidae. Eight subgenera are recognized within this genus (Oosterbroek 2021; Kang & Zhang 2021). The subgenus *Laosa* Edwards, 1926 is a small group within the genus *Libnotes*, which has 21 known species and can be easily distinguished by the wing with two additional cross veins in cells r_3 (r-r) and r_5 (r-m, absent in some species).

Five *Laosa* species have been previously recorded from China, of which two were published by Kang and Zhang (2021). Since that publication, further new materials in this subgenus became available. In the present paper, one new species of the subgenus *Laosa* from Hubei, China is added to the Chinese fauna. A key to Chinese *Laosa* species based on

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type/non-type specimens and the literature is also presented.

Material and methods

Specimens for this study were collected from Shennongjia, Hubei, China by Chikun YANG in 1984. All the specimens were deposited in the Entomological Museum of China Agricultural University, Beijing, China (CAU). Type species of Chinese *Laosa* examined during this study were deposited in CAU and the Natural History Museum, London, UK (NHM). Genitalic preparation of male was made by macerating the apical portion of the abdomen in cold 10% NaOH for 12–15 hours. Observations and illustrations were made using a ZEISS Stemi 2000-C stereomicroscope. Photographs were taken with a Canon EOS 90D digital camera through a macro lens. Details of coloration were examined in specimens immersed in 75% C₂H₅OH.

The morphological terminology mainly follows McAlpine (1981) and for venation follows Alexander and Byers (1981). The following abbreviations are used in figures: aed – aedeagus; cerc – cercus; goncx – gonocoxite; hyp vlv – hypogynial valve; i gonst – inner gonostylus; o gonst – outer gonostylus; pm – paramere; tg 9 – ninth tergite; tg 10 – tenth tergite.

List of Chinese *Laosa* crane flies

- Libnotes* (*Laosa*) *baiyunensis* Kang & Zhang, 2021 (Henan)
Libnotes (*Laosa*) *chikunyangi* **sp. nov.** (Hubei)
Libnotes (*Laosa*) *diphragma* (Alexander, 1934) (Sichuan)
Libnotes (*Laosa*) *fuscinervis* Brunetti, 1912 (Yunnan); also India
Libnotes (*Laosa*) *regalis* Edwards, 1916 (Taiwan)
Libnotes (*Laosa*) *transversalis* de Meijere, 1916 (Taiwan); also Indonesia

Taxonomy

Key to Chinese species of *Laosa*

1. Wing without additional cross vein in cell r₅ 2
- Wing with additional cross vein in cell r₅ (Fig. 1D) 3
2. Wing nearly unpatterned except very light brown spots at fork of Sc and over tip of Sc₂; r-r in alignment with basal section of M₃ *L. (L.) transversalis* de Meijere
- Wing with many conspicuous spots around cross veins and portions of longitudinal veins as well as in cells; r-r distinctly before basal section of M₃ *L. (L.) fuscinervis* Brunetti
3. Wing with r-m in alignment with basal section of M₃, tip of Sc₂ situated beyond R₂ 4
- Wing with r-m distinctly before basal section of M₃, tip of Sc₂ situated before R₂ (Fig. 1D) 5
4. Prescutum with four ill-defined stripes; wing with a large spot in cell a₁, tip of A₂ strongly curved downwards *L. (L.) regalis* Edwards
- Prescutum without conspicuous stripe; wing without spot in cell a₁, tip of A₂ nearly straight or slightly curved *L. (L.) baiyunensis* Kang & Zhang
5. Prescutum with two median stripes; wing short and broad, about 3.7 times as long as wide, r-r less than its own length before R₂ *L. (L.) diphragma* (Alexander)

- Prescutum without conspicuous stripe (Fig. 1C); wing long and narrow, about 4.4–4.5 times as long as wide, r-r about 1.5 times its own length before R_2 (Fig. 1D) *L. (L.) chikunyangi* sp. nov.

***Libnotes (Laosa) chikunyangi* sp. nov.** (Figs 1, 2)

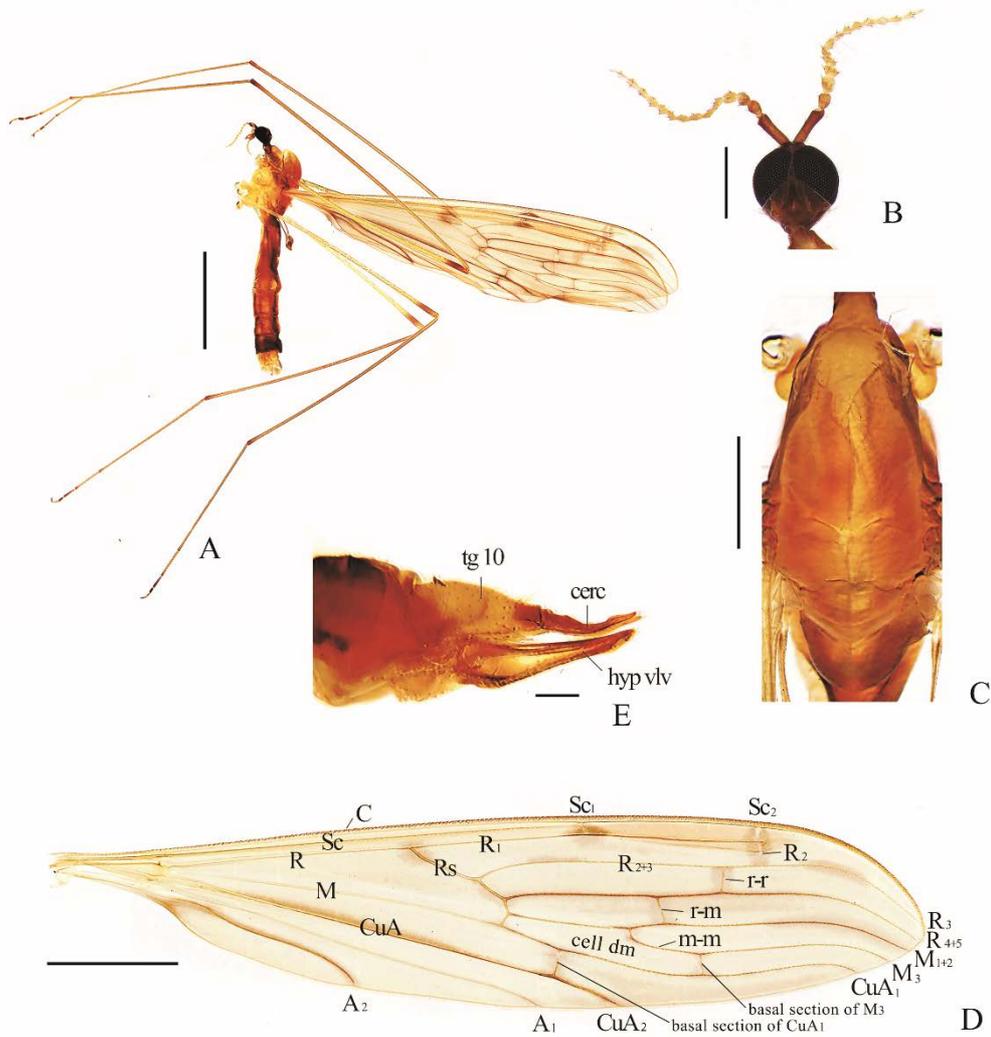


Figure 1. *Libnotes (Laosa) chikunyangi* sp. nov. A. Habitus of male, lateral view; B. Head, dorsal view; C. Thorax, dorsal view; D. Wing; E. Female ovipositor, lateral view. Scale bars = 5.0 mm (Fig. A); 1.0 mm (Figs B, C); 3.0 mm (Fig. D); 0.3 mm (Fig. E).

Description. Male. Body length 13.0 mm, wing length 20.0 mm and width 4.5 mm.

Head (Fig. 1B). Dark brown. Hairs on head brown. Antenna length 2.5 mm, brown with flagellomeres paler. Scape long cylindrical; pedicel oval, nearly as long as first flagellomere; flagellomeres oval, tapering apically, terminal flagellomere 1.5 times as long as preceding segment. Mouthparts dark brown with white hairs; palpus brown with brown hairs.

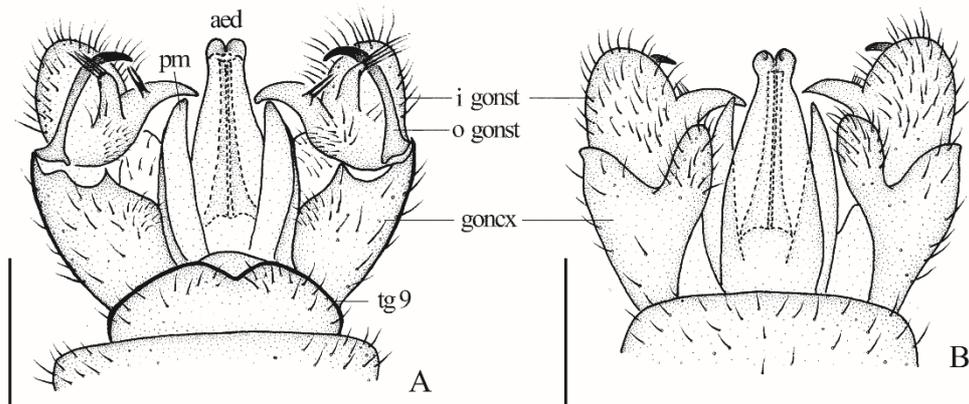


Figure 2. *Libnotes* (*Laosa*) *chikunyangi* sp. nov., male hypopygium. A. Dorsal view; B. Ventral view. Scale bars = 0.5 mm.

Thorax (Fig. 1C). Pronotum brown with sides brownish black. Prescutum brown with side edges brownish black. Scutum brown. Scutellum pale brown. Mediotergite pale brown with sides brownish black. Pleura (Fig. 1A) brownish yellow with a broad brownish black stripe extending from cervical region to base of wing. Hairs on thorax white. Coxae yellow; trochanters pale yellow; femora yellow to brownish yellow with tips dark brown; tibiae brown with tips darker; tarsi brown with terminal segments darker. Hairs on legs dark brown. Wing (Fig. 1D) tinged with pale brownish yellow. Darkened areas around cross veins, vein CuA, vein A₂ and distal end of cell dm; costal area with three small spots at base of Rs, fork of Sc, and over R₁₊₂ and R₂; three long spots at subbase of R₂₊₃, middle of R₃ and tip of M₁₊₂. Venation: Sc long, ending far beyond fork of Rs and near middle of cell dm. Basal section of Sc₂ very close to tip of Sc₁. Tip of Sc₂ situated before R₂, nearly transverse and indistinct at wing margin. Rs very short, slightly sinuous. Radial and medial veins distinctly curved caudally before wing margin. Two additional cross veins in cells r₃ and r₅, the former (r-r) at middle of cell r₃, the latter (r-m) at basal 1/3 of cell r₅ and distinctly before basal section of M₃. Cell dm elongate, more than 6 times as long as its width; m-m elongate, 3 times as long as basal section of M₃. Basal section of CuA₁ twice its own length beyond fork of M and at about 1/3 of cell dm. A₁ nearly straight. A₂ slightly sinuous. Halter length 2.3 mm, brown.

Abdomen. Tergites brownish yellow with a brown median stripe, lateral borders brown; eighth tergite brown with base narrowly brownish yellow. Sternites brownish yellow, eighth sternite brown with base narrowly brownish yellow. Hairs on abdomen white.

Hypopygium (Fig. 2). Ninth tergite with widely rounded posterior margin and a small median emargination. Gonocoxite elongate, relatively stout with an elongate, blunt-apexed ventromesal lobe; inside edge with small setose bulge. Outer gonostylus arched at 2/3 length, tip acute. Inner gonostylus short, oval with long arched rostral prolongation armed with two spines near base from a single tubercle; an elongate lobe arising dorsally at subbase of inner gonostylus with a brush of long setae at apex and directed laterally. Paramere wide at base, elongate, triangular distally. Penis long, tip sunken in the middle.

Female. Body length 12.0 mm, wing length 16.0 mm and width 3.6 mm. Similar to male,

but eighth tergite brownish yellow with a broad brown median stripe. Tenth tergite brownish yellow, elongate. Cercus (Fig. 1E) brown, tip slightly exceeding hypogynial valve. Hypogynial valve brownish yellow with borders darker, base near middle of tenth tergite.

Holotype. ♂(CAU), **China**, Hubei Province, Shennongjia Forestry District, Dayanwu, 1700 m, 28-VI-1984, Chikun YANG. **Paratype.** 1♀(CAU), same data as holotype.

Etymology. This new species is named after Chikun Yang, not only in appreciation for collecting the specimens, but also in honor of his contributions to the taxonomy of Chinese crane flies.

Diagnosis. Prescutum brown without conspicuous stripe, only side edges brownish black. Pleura brownish yellow with a broad brownish black stripe. Wing with darkened areas around cross veins, vein CuA, vein A₂ and distal end of cell dm; costal area with three small spots at base of Rs, fork of Sc, and over R₁₊₂ and R₂; three long spots at subbase of R₂₊₃, middle of R₃ and tip of M₁₊₂. Tip of Sc₂ situated before R₂, r-r at middle of cell r₃, r-m at basal 1/3 of cell r₅ and distinctly before basal section of M₃, basal section of CuA₁ twice its own length beyond fork of M and at about 1/3 of cell dm.

Remarks. This new species is somewhat similar to *L. (L.) riedelella* (Alexander, 1934) from Papua New Guinea in having similar wing venation, but it can be easily distinguished from the latter by following characters: the brown tibiae without subbasal ring (Fig. 1A), the axillary region of wing without any spot, and the wing with basal section of CuA₁ twice its own length beyond fork of M (Fig. 1D). Whereas in *L. (L.) riedelella*, the tibiae are yellow with broad brown subbasal rings, the axillary region of wing is darkened, and the basal section of CuA₁ is 1.5 times its own length beyond fork of M (Alexander 1934). This species is also somewhat similar to *L. (L.) baiyunensis* Kang & Zhang, 2021 from China in having similar body color but can be easily distinguished by following characters: the brown antenna with paler flagellomeres (Fig. 1B), the long spot at middle of R₃, the cross vein r-m being distinctly before basal section of M₃, and the tip of Sc₂ being before R₂ (Fig. 1D). In *L. (L.) baiyunensis*, the antenna is uniformly brown, the vein R₃ has no conspicuous spot at middle, the cross vein r-m is in alignment with basal section of M₃, and the tip of Sc₂ is beyond R₂ (Kang & Zhang 2021).

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