

One new species of the Chinese endemic delphacid genus *Belocera* Muir (Hemiptera: Fulgoroidea) with a key to all species

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Abstract: A new species of the Chinese endemic delphacid genus *Belocera* Muir, *B. parafuscifrons* sp. nov., is described and illustrated from Yunnan Province in southwestern China. An identification key to males of all *Belocera* species worldwide is provided. Photographs of adult habitus and illustrations of male and female genitalia of this new species are given.

Key words: Hemiptera; Fulgoroidea; Delphacidae; *Belocera*; new species; China

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中国簇角飞虱属一新种并附分种检索表（半翅目：蜡蝉总科）

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摘要: 记述中国簇角飞虱属 *Belocera* Muir 1 新种：拟褐额簇角飞虱 *B. parafuscifrons* sp. nov.，本新种与其近似种褐额簇角飞虱 *B. fuscifrons* Chen, 2002 的区别在于：阳茎直，端向略狭，端部具 4 个刺状突起，其右侧端突基部具 1 小齿；阳基侧突侧观端部 2/5 强烈弯曲，外端角状。文章提供了成虫及雄、雌性外生殖器特征图，编制了属的分种检索表。研究标本保存在西北农林科技大学昆虫博物馆。

关键词: 半翅目；蜡蝉总科；飞虱科；簇角飞虱属；新种；中国

Introduction

The Chinese endemic delphacid genus *Belocera* was established by Muir (1913) to accommodate a single species, *B. sinensis* Muir (1913) from Macao, China. It belongs to the tribe Tropidocephalini of the subfamily Delphacinae and is easily separated from other genera of this tribe by the frons widest in the basal 1/3, the antennae with the scape forked at its apex, sagittate and slightly flattened, the forewing bearing a fuscous median longitudinal stripe and having a light yellowish white costal area (Chen *et al.* 2007). All *Belocera* species are bamboo feeders and are restricted to the Oriental Region with five included species: *B. sinensis* Muir (1913), *B. nigrinotalis* Ding & Yang (1986), *B. fuscifrons* Chen (2002), *B. lanpingensis* Chen

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& Yang (2007) and *B. ampelocalama* Chen & Tsai (2007). This paper adds a new species: *B. parafuscifrons* n. sp. from Yunnan Province in southwestern China and provides a key to all species in the genus.

Material and methods

Dry pinned and mounted specimens were used for this study. External morphology was observed under a stereoscopic microscope and characters were measured with an ocular micrometer. Genital segments of the examined specimens were macerated in 10% NaOH and drawn from preparations in glycerin using a light microscope. Habitus photos were taken using a Scientific Digital micrography system equipped with an Auto-montage imaging system and a QIMAGING Retiga 4000R digital camera (CCD). Multiple photographs were compressed into final images.

Specimens examined in this study are deposited in the Entomological Museum, Northwest A&F University, Yangling, Shaanxi, China (NWAUFU). Morphological terminology used in this description follows that of Ding (2006). Measurements of body length equal the distance between the apex of vertex and tip of abdomen. All measurements are in millimeters (mm).

Description

Belocera Muir, 1913

Belocera Muir, 1913: 239; Kuoh *et al.*, 1983: 43; Yang & Yang, 1986: 42; Chen *et al.*, 2007: 675. Type species: *B. sinensis* Muir, 1913, by original designation.

Diagnosis. Small-sized, yellowish brown to brown delphacids. Head including eyes wider than pronotum. Vertex trapeziform, base more than twice as broad as long in midline, Y-shaped carina distinct. Frons with median carina simple, widest at basal 1/3, postclypeus in profile strongly bent caudad in apical part. Antennae with scape sagittate, slightly flattened and forked apically, with two brown to dark brown oblique bands, pedicel cylindrical. Post-tibial spur thick, with an apical tooth, without teeth on lateral margin. Forewings narrow and elongate, often with a fuscous central longitudinal fascia, costal area light yellowish white. Male pygofer with ventral margin concave or having medioventral processes. Genital styles developed. Aedeagus with phallobase developed, phallus tubular, protruding processes of various lengths from apex. Diaphragm open. Anal segment ring-like, without processes or with a stout, very short process.

Distribution. China (Macao, Taiwan, Hainan, Yunnan, Guizhou).

Checklist of *Belocera* Muir

- B. sinensis* Muir (1913)—China (Macao, Taiwan, Guizhou, Hainan)
- B. nigrinotalis* Ding & Yang, 1986—China (Yunnan)
- B. fuscifrons* Chen, 2002—China (Guizhou)
- B. lanpingensis* Chen & Yang, 2007—China (Yunnan)
- B. ampelocalama* Chen & Tsai, 2007—China (Guizhou)
- B. parafuscifrons* **sp. nov.**—China (Yunnan)

Key to the species of *Belocera* Muir (male)

1. Frons with apical part bright yellow 2
- Frons with apical part yellowish brown to brown 3
2. Male pygofer in caudal view with ventral margin sharply concave, V-like *B. nigrinotalis* Ding & Yang
- Male pygofer in caudal view with ventral margin evenly concave *B. sinensis* Muir
3. Frons without small light spots; male pygofer with 3 medioventral processes on ventral margin
..... *B. ampelocalamus* Chen & Tsai
- Frons with paired small light spots; male pygofer without medioventral processes on ventral margin 4
4. Male anal segment with caudoventral margin produced into a short, stout process on right side; genital styles distinctly incurved in caudal view; phallus with 1 slender spinous process at apex
..... *B. lanpingensis* Chen & Yang
- Male anal segment with caudoventral margin incised medially, without process on right side; genital styles parallel in caudal view; phallus with more than 1 slender spinous processes at apex 5
5. Phallus straight and slightly narrowing towards apex, the right apical process has a small tooth at its base; genital styles in profile strongly curved in apical 2/5, outer angle angulate cephalad
..... *B. parafuscifrons* sp. nov.
- Phallus sinuate and distinctly narrowing apically, the right apical process without small tooth; genital styles in profile not curved in apical 2/5, outer angle distinctly produced and narrowed apically · *B. fuscifrons* Chen

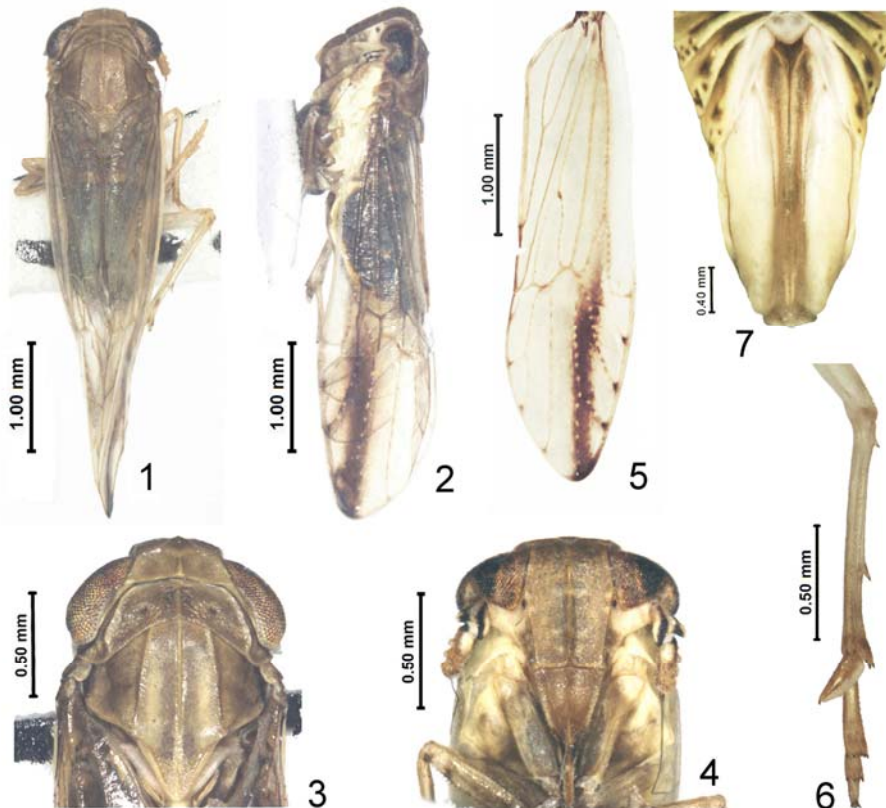
***Belocera parafuscifrons* sp. nov.** (Figs. 1–18)

Body length. male (macropterous, n = 3) 2.37–2.40 mm; female 2.68–2.86 mm (macropterous, n = 3), Total length (including tegmen): male (macropterous) 4.24–4.50 mm, female (macropterous) 4.72–4.83 mm.

General color brown to blackish brown. Eyes brown to black brown, ocelli reddish brown (Figs. 1–4). Antennae with scape having two black oblique bands, pedicel brown (Fig. 4). Basal part of genae brown, with 3 small yellowish spots along inner margin on each side, apical part of genae yellow. Frons with pairs of light spots. Forewings semitransparent, speckled with pale flecks, with light yellowish white band along anterior margin, behind this a parallel brownish longitudinal stripe which becomes dark brown in apical 2/5, a dark spot on furcation of Cu vein, at the end of each longitudinal vein with a small brown to dark brown spot (Fig. 5). Dorsum of male abdomen blackish except laterally yellowish white, venter of abdomen yellowish to orange, anteriorly brown to dark brown in middle and sublaterally with brown to dark brown spots on each segment. Legs brown, apices of spines on tibiae and tarsi black (Fig. 6). Pygofer yellow to yellowish brownish. Female with the same color as male, ovipositor brown (Fig. 7).

Head including eyes wider than pronotum (about 1.16: 1) (Figs. 1, 3). Vertex trapeziform, base about 2.65 times as broad as long in midline; distinctly narrower at apex than at base (about 0.80: 1), anterior margin slightly projecting in front of eyes and produced in middle, submedian carinae originating near middle of vertex and uniting at apex; Y-shaped carina distinct, areas of basal compartments shallowly concave (Fig. 3); in lateral view vertex meeting lateral carinae of frons with obtuse angle at fastigium (Fig. 2). Frons ca. 1.25 times higher than its maximum width, widest above the level of ocelli, lateral carinae keeled, median carina distinctly convex, shortly forked at base, frontal areas between carinae almost flat, frons at apex slightly shorter than at base (about 0.85: 1) (Fig. 4). Rostrum with apex surpassing mesotrochanters. Postclypeus at base slightly wider than frons at frontoclypeal suture, post-

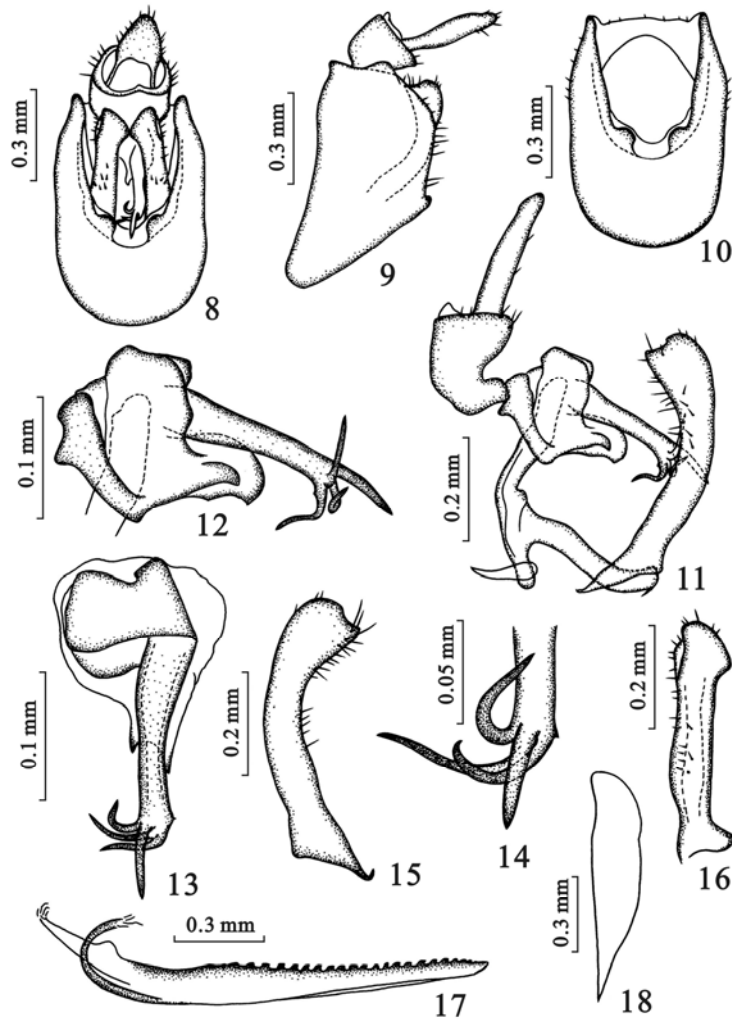
and anteclypeus together approximately 0.79x length of frons, median carina distinctly convex, lateral carinae slightly keeled, in profile apex of postclypeus strongly bent caudad (Figs. 2, 4). Antennae surpassing frontoclypeal suture, scape in middle line slightly shorter than apical width (about 0.84: 1), pedicel cylindrical, about 2.18 times longer than scape in midline (Fig. 4).



Figures 1–7. *Belocera parafuscifrons* sp. n. 1. Female adult, dorsal view; 2. Same, left lateral view; 3. Head and thorax, dorsal view; 4. Head, ventral view; 5. Left forewing; 6. Metatibia and metatarsus; 7. Female genitalia, ventral view.

Thorax. Pronotum nearly as long as vertex in midline, anterior margin transverse, posterior margin concave inwardly, lateral carinae distinctly convex, arising from near the posterolateral angle of vertex, running as anterolateral margin, subapically strongly curving inward and almost reaching hind margin, pronotum width 0.78–0.90, length 0.15–0.18 (Figs. 1, 3). Mesonotum with medially ca. 2.16 times longer than vertex and pronotum together, lateral carinae slightly converging and reaching near hind margin, median carina reaching end of scutellum (Fig. 3). Forewing 3.70–4.10 mm long, surpassing tip of abdomen more than half of total length, with maximum width in apical fourth, apical margin acutely rounded, row of crossveins in apical 2/5 (Figs. 2, 5). Legs with hind tibiae 0.88–0.92 mm long, bearing 2 lateral teeth on outer edge and 5 teeth at apex (grouped 2 at inner side and 3 at outer side), metabasitarsus (0.33–0.37) nearly as long as tarsomere II (0.13–0.14) + III (0.20–0.22)

combined, metabasitarsus joint distally with 6 teeth in a transverse row, tarsomere II with 4 teeth (Fig. 6). Post-tibial spur (0.26–0.27) slightly shorter than metabasitarsus, solid, thick, without teeth along lateral margin but with a rigid apical tooth (Fig. 6).



Figures 8–18. *Belocera parafuscifrons* sp. n. 8. Male genitalia, caudal view; 9. Same, left lateral view; 10. Male pygofer, caudoventral view, anal segment, aedeagus and parameres removed; 11. Anal segment, aedeagus complex and parameres, left lateral view; 12. Aedeagus, left lateral view; 13. Same, dorsal view; 14. Apex of aedeagus, dorsolateral view from left side; 15. Right paramere, right lateral view; 16. Left paramere, caudal view; 17. First valvifers; 18. Second valvula.

Male genitalia. Pygofer elongate in caudal aspect, ventrocaudal margin U-like, in lateral view posterior margin convex, caudoventral angle produced into a round process, ventral margin wider than dorsal margin (Fig. 9). Genital styles flattened, in caudal view parallel and contiguous near apex, in profile strongly curved in apical 2/5, subapex broadened with apical margin slightly emarginated, outer angle angulate cephalad (Figs. 8, 9, 11, 15, 16). Aedeagus with phallobase developed and complex, entwining base of phallus, phallus tubular, in profile

long and nearly straight, slightly narrowing towards apex, terminating in 4 spinous processes, upper one almost straight, directed caudoventrad, the remaining processes turned left with 2 of them curved dorsad, in dorsal view the right one has a small tooth at its base (Figs. 11–14). Diaphragm open. Anal segment of male ring-like, ventral margin incised medially, without process on ventral margin (Fig. 8).

Female genitalia with ovipositor brown, not overpassing the pygofer (Fig. 7), first valvifers moderately large (Figs. 7, 18), second valvula long and large, sclerotized, curved basally, straight and narrowing towards apex, dorsally with numerous blunt teeth and ventrally with small teeth near the tip (Fig. 17).

Holotype. ♂, **China:** Yunnan, Yingjiang County, 1092 m, 02-VI-2011, coll. Silong XU;
Paratypes. 2♂3♀, same data as holotype.

Etymology. The specific epithet is derived from the combination of “para-” and “fuscifrons” which refer to the similarity of the new species to *B. fuscifrons* Chen, 2002.

Distribution. Known only from the type locality in southern China (Yunnan Province).

Remarks. *Belocera parafuscifrons* sp. nov. is related to *Belocera fuscifrons* Chen, 2002, but differs from the latter by the phallus straight and slightly narrowing towards apex (Figs. 11–14) (sinuate and distinctly narrowing apically in *B. fuscifrons*), the right apical process has a small tooth at its base (Figs. 11–14) (without small tooth at base in *B. fuscifrons*); genital styles in profile strongly curved in apical 2/5 and outer angle angulate cephalad (Figs. 11, 15) (not curved in apical 2/5 and outer angle distinctly produced and narrowed apically in *B. fuscifrons*).

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