

Research article

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**Three new species of the bamboo-feeding planthopper genus
Bambusiphaga Huang & Ding from China
(Hemiptera: Fulgoroidea: Delphacidae)**Hong-Xing LI¹, Xiang-Sheng CHEN² & Lin YANG^{1,3,*}¹Department of Light Industry & Chemical Engineering of Guizhou Light Industrial Technical College, Guiyang, Guizhou, 550025, China.^{2,3}Institute of Entomology, Guizhou University, Guiyang, Guizhou, 550025, China.^{2,3}The Provincial Special Key Laboratory for Development and Utilization of Insect Resources, Guizhou University, Guiyang, Guizhou, 550025, China.*Corresponding author: yanglin6626@163.com¹Email: lhx5340@163.com²Email: chenxs3218@163.com¹urn:lsid:zoobank.org:author:A6E7A65E-219F-4B18-B7CB-AB4B9893DE48²urn:lsid:zoobank.org:author:D9953BEB-30E6-464A-86F2-F325EA2E4B7C³urn:lsid:zoobank.org:author:17FAF564-8FDA-4303-8848-346AB8EB7DE4

Abstract. Three new species of the bamboo-feeding genus *Bambusiphaga* Huang & Ding, 1979, *B. parvula* sp. nov., *B. angulosa* sp. nov., and *B. nigrigena* sp. nov., are described and illustrated from China. A key to species of the genus is provided. Habitus photos for adults and illustrations of male genitalia are also given.

Keywords. Bamboo pests, Fulgoroidea, Oriental region, taxonomy.

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Introduction

Huang & Ding (1979) established the bamboo-feeding planthopper genus *Bambusiphaga* with *B. nigropunctata* Huang & Ding, 1979 as its type species. It belongs to the tribe Tropidocephalini within the subfamily Delphacinae (Hemiptera: Fulgoroidea: Delphacidae). Until now, 28 species of this genus were known from Oriental region, viz, China (25 species), Philippines (1 species), Singapore (2 species), Malaysia (2 species), North-Eastern Himalayas (1 species), and India (1 species) (Yang & Chen 2011; Qin *et al.* 2012; Li *et al.* 2018; Ramya & Meshram 2019). *Bambusiphaga* can be recognized by the following characters: body yellowish-brown, often with brown or black markings; head including eyes narrower than pronotum; mesonotum longer at middle line than vertex and pronotum together;

aedeagus (phallosome) complex, tubular, with or without phyllobase; and segment 10 ring-like, with or without process.

In this paper, three new species of *Bambusiphaga*, *B. parvula* sp. nov., *B. angulosa* sp. nov., and *B. nigrigena* sp. nov., are described and illustrated from Yunnan, China. A key is provided to separate all species.

Material and methods

The morphological terminology follows Yang & Yang (1986). The standard terminology of venation follows Bourgoin *et al.* (2015). Dry male specimens were used for the descriptions and illustrations. External morphology was observed under a stereoscopic microscope and characters were measured with an ocular micrometer. Color pictures for adult habitus were obtained by the KEYENCE VHX-6000 system. The genital segments of the examined specimens were macerated in 10% KOH and drawn from preparations in glycerin jelly using a Leica MZ 12.5 stereo microscope. Illustrations were scanned with a Canon CanoScan LiDE 200 and imported into Adobe Photoshop ver. 6.0 for labeling and plate composition.

The type specimens of the new species are deposited in the Institute of Entomology, Guizhou University, Guiyang, China (GUGC).

Institutional abbreviation

GUGC = Institute of Entomology, Guizhou University, Guiyang, China

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Hemiptera Linnaeus, 1758
Infraorder Fulgoromorpha Evans, 1946
Family Delphacidae Leach, 1815
Subfamily Delphacinae Leach, 1815
Tribe Tropidocephalini Muir, 1915

Genus *Bambusiphaga* Huang & Ding, 1979

Type species

Bambusiphaga nigropunctata Huang & Ding, 1979.

Diagnosis

Head including eyes narrower than pronotum. Vertex quadrate or rectangular, with submedian carinae uniting at apex of vertex. Frons rectangular, longer at middle line than wide (1.64–2.7:1), median carina distinct and simple. Antennae cylindrical, basal segment slightly longer than or equal to width, 2nd segment longer than 1st (more than 2.7:1), reaching or almost reaching frontoclypeal suture. Pronotum about as long as vertex, lateral carinae straight, reaching or almost reaching hind margin. Mesonotum longer at middle line than vertex and pronotum together (about 1.3–2.0:1). Spinal formula of hind leg 5-6-4. Post-tibial spur without teeth along posterior margin, but with an apical tooth. Forewings with cross vein deposited medially. Anal style small. Anal segment of male ring-like, ventral margin with or without a process. Pygofer with or without medioventral processes. Aedeagus with or without

phyllobase; phallus complex, tubular. Genital styles simple, with a process, or forked apically. Seventh abdominal sternite of female present or absent.

Host plants

Bamboo (Bambusoideae).

Distribution

Oriental region, with highest species diversity in China.

Key to species of the genus *Bambusiphaga* Huang & Ding, 1979 (male)

(modified from Li *et al.* 2018)

1. Vertex dark brown or with dark brown markings 2
– Vertex without any markings 3
2. Vertex yellowish brown, basal compartment with a black oval spot in middle part; anal segment without a process, pygofer without medioventral processes (Huang *et al.* 1979: figs 2, 4)
..... *B. nigropunctata* Huang & Ding, 1979
– Vertex dark brown, basal compartment without a black oval spot; anal segment with a very long process that surpasses base of genital styles; pygofer with conjugated medioventral processes (Chen & Liang 2007: figs 46, 49) *B. pianmaensis* Chen & Liang, 2007
3. Mesonotum with dark brown markings 4
– Mesonotum without dark brown markings 14
4. Pronotum with dark brown markings on lateral areas 5
– Pronotum without dark brown markings on lateral areas 12
5. Forewings with basal $\frac{1}{3}$ black or with black markings at basal half 6
– Forewings with a large irregular pale brown stripe along transverse vein, hence bending along posterior margin to apex (Li *et al.* 2018: fig. 8) *B. yingjiangensis* Li, Yang & Chen, 2018
6. Forewings with basal $\frac{1}{3}$ black 7
– Forewings with large black markings at base 10
7. Anal segment without a process on ventral margin (Yang & Chen 2011: fig. 6)
..... *B. kunmingensis* Chen & Yang, 2011
– Anal segment with a very long process on ventral margin 8
8. Anal spiny process at left lateroapical angle of anal segment 9
– Anal spiny process at right lateroapical angle of anal segment (Hou & Chen 2010: fig. 14)
..... *B. basifusca* Hou & Chen, 2010
9. Pygofer with a medioventral process; aedeagus with two apical processes (Qin *et al.* 2012: figs 12, 16–17) *B. taibaishana* Qin, 2012
– Pygofer without medioventral process; aedeagus without apical processes (Ding 2006: fig. 54c, f)
..... *B. fascia* Huang & Tian, 1980
10. Forewings with a large black marking at base; anal segment with a long process on ventral margin 11
– Forewings with two large black markings at base; anal segment without process on ventral margin (Li *et al.* 2018: figs 29, 31) *B. ventroprocessa* Li, Yang & Chen, 2018

11. Anal segment with a long ventral process at left lateroapical angle; pygofer with medioventral process (Chen <i>et al.</i> 2000: fig. 4)	<i>B. maculata</i> Chen & Li, 2000
– Anal segment with a long ventral process medially; pygofer without medioventral process (Fig. 6C, F)	<i>B. nigrigena</i> sp. nov.
12. Mesonotum without black marking in middle (Ramya & Meshram 2019: fig. 3)	<i>B. unispina</i> Ramya & Meshram, 2019
– Mesonotum with black markings in middle	13
13. Forewings somewhat reddish orange, costal margin dark brown; genital styles relatively broad and short (Huang & Ding 1980: fig. 8c, f)	<i>B. nigromarginata</i> Huang & Tian, 1980
– Forewings somewhat yellowish brown, costal margin yellowish brown; genital styles relatively slender (Yang & Yang 1986: fig. 20c, e)	<i>B. taiwanensis</i> (Muir, 1917)
14. Anal segment with a process on ventral margin	15
– Anal segment without a process on ventral margin	19
15. Pygofer with a medioventral process (Ding 2006: fig. 62c)	<i>B. bakeri</i> (Muir, 1919)
– Pygofer without a medioventral proces	16
16. Anal segment with the process on ventral margin very long, reaching ventral margin of pygofer	17
– Anal segment with the process on ventral margin very short	18
17. Genital styles with a process at base, apex rounded (Ding 2006: fig. 59f–g)	<i>B. jinghongensis</i> Ding & Hu, 1986
– Genital styles without a process at base, apex forked (Huang <i>et al.</i> 1979: fig. 18)	<i>B. mirostylis</i> Huang & Ding, 1979
18. Tegula with apical ½ dark brown; pygofer with hind margin produced at an acute angle medially; genital styles slender; aedeagus without phyllobase (Ding & Hu 1982: figs 1–4)	<i>B. huangi</i> Ding & Hu, 1982
– Tegula fully yellowish brown; pygofer with hind margin not produced medially; genital styles broad and short; aedeagus with developed phyllobase (Chen & Li 2000: figs 11, 13, 15–16)	<i>B. wangmoensis</i> Chen & Li, 2000
19. Pygofer with a spine on ventral margin	20
– Pygofer without a spine on ventral margin	22
20. Genital style with an inversed spine on caudal side near apex which is as long as 1/5 of genital style; aedeagus with three spines subapically (Yang & Chen 2011: figs 20–22)	<i>B. yangi</i> Chen & Yang, 2011
– Genital style with an angular or tooth-like process on caudal side near apex; aedeagus without spines subapically	21
21. Genital styles asymmetrical, right one shorter than left one, without tooth-like process subapically on caudal side; aedeagus with an inversed process on right side near apical 1/3 (Muir 1919: fig. 8)	<i>B. singaporensis</i> (Muir, 1919)
– Genital styles symmetrical; aedeagus without any processes (Ding 1982: figs 3, 5)	<i>B. luodianensis</i> Ding, 1982
22. Genital styles with a finger-like process at base	23
– Genital styles without a finger-like process at base	24

23. Genital styles with a finger-like process subapically; aedeagus curved in middle (Chen & Liang 2007: figs 20–22) *B. maolanensis* Chen & Liang, 2007
– Genital styles with a lamellate process subapically; aedeagus almost straight (Hou & Chen 2010: figs 9–10) *B. hainanensis* Hou & Chen, 2010
24. Genital styles forked apically 25
– Genital styles not forked apically 27
25. Frons longer at middle line than wide at widest part, about 2.0:1; basocaudal portion of genital styles in profile produced at a right angle (Yang & Yang 1986: fig. 22b, h) *B. membranacea* Yang & Yang, 1986
– Frons longer at middle line than wide at widest part, about 2.5: 1; basocaudal portion of genital styles in profile not produced at a right angle 26
26. Median portion of genital styles granulate (Huang *et al.* 1979: figs 8–11)
..... *B. furca* Huang & Ding, 1979
– Median portion of genital styles not granulate (Aschi 1983: fig. 4) *B. lynchi* Asche, 1983
27. Ventral margin of anal segment incised medially; genital styles short, lamellate (Huang *et al.* 1979: fig. 20) *B. lacticolorata* Huang & Ding, 1979
– Ventral margin of anal segment not incised medially; genital styles slender 28
28. Genital styles with a spinous process near apex (Fig. 4F–G) 29
– Genital styles without a spinous process near apex 30
29. Aedeagus with some small teeth near apex, not forked at apex (Fig. 2H–I) *B. parvula* sp. nov.
– Aedeagus without small teeth near apex, forked at apex (Fig. 4H–I) *B. angulosa* sp. nov.
30. Apex of vertex obviously broadened, frons widest at base; apex of genital styles without small teeth; aedeagus short and stout (Huang *et al.* 1979: fig. 17) *B. similis* Huang & Tian, 1979
– Apex of vertex not broadened, frons widest at apex; apex of genital styles with several small teeth; aedeagus relatively long (Huang *et al.* 1979: figs 13–15) *B. citricolorata* Huang & Tian, 1979

Bambusiphaga parvula sp. nov.

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Figs 1–2

Diagnosis

Bambusiphaga parvula sp. nov. can be distinguished from the remaining species of the genus by having the vertex and mesonotum without any dark brown markings, the ventral margin of the anal segment without a process, not incised medially, the pygofer without a spine on the ventral margin, the genital styles without a finger-like process at the base, not forked apically, and the aedeagus with some small teeth near the apex, not forked at the apex.

Etymology

The specific epithet is derived from the Latin word ‘*parvula*’, referring to the small spines near the apex of the aedeagus.

Type material

Holotype

CHINA • ♂; Yunnan, Yingjiang County; 24°44' N, 97°33' E; 20 Aug. 2018; H.X. Li, F.E. Li and N. Gong leg.; on bamboo; GUGU-DE-BA-20180801.

Paratypes

CHINA • 5 ♂♂; same collection data as for holotype; GUGU-DE-BA-20180802 to GUGU-DE-BA-20180806.

Description

MEASUREMENTS. Body length including forewing: male 3.8–4.1 mm (N = 6).



Fig. 1. *Bambusiphaga parvula* sp. nov., ♂, holotype (GUGU-DE-BA-20180801). **A.** Male adult, dorsal view. **B.** Same, lateral view. **C.** Head and thorax, dorsal view. **D.** Head and thorax, lateral view. **E.** Face. **F.** Forewing. Scale bars = 0.5 mm.

COLORTION. General color yellowish (Fig. 1). Eyes light yellow to brown, ocelli reddish brown. Forewings (Fig. 1F) pale yellowish orange, with a small dark brown mark along cross veins CuP-CuA₁, veins yellow. Abdomen (Fig. 1A–B) with dorsal areas of 5th to 8th segments dark brown.

HEAD AND THORAX. Vertex (Figs 1C, 2A) at midline shorter than wide at base (1: 1.17), width at apex slightly narrower than at base (1: 1.08), anterior margin broadly rounded, carinae distinct. Frons (Figs 1E, 2B) in middle line longer than wide, at widest part about 2.23: 1, widest at apex, median carina simple. Base of postclypeus (Figs 1E, 2B) as wide as apex of frons. Antennae (Figs 1E, 2B) with basal segment

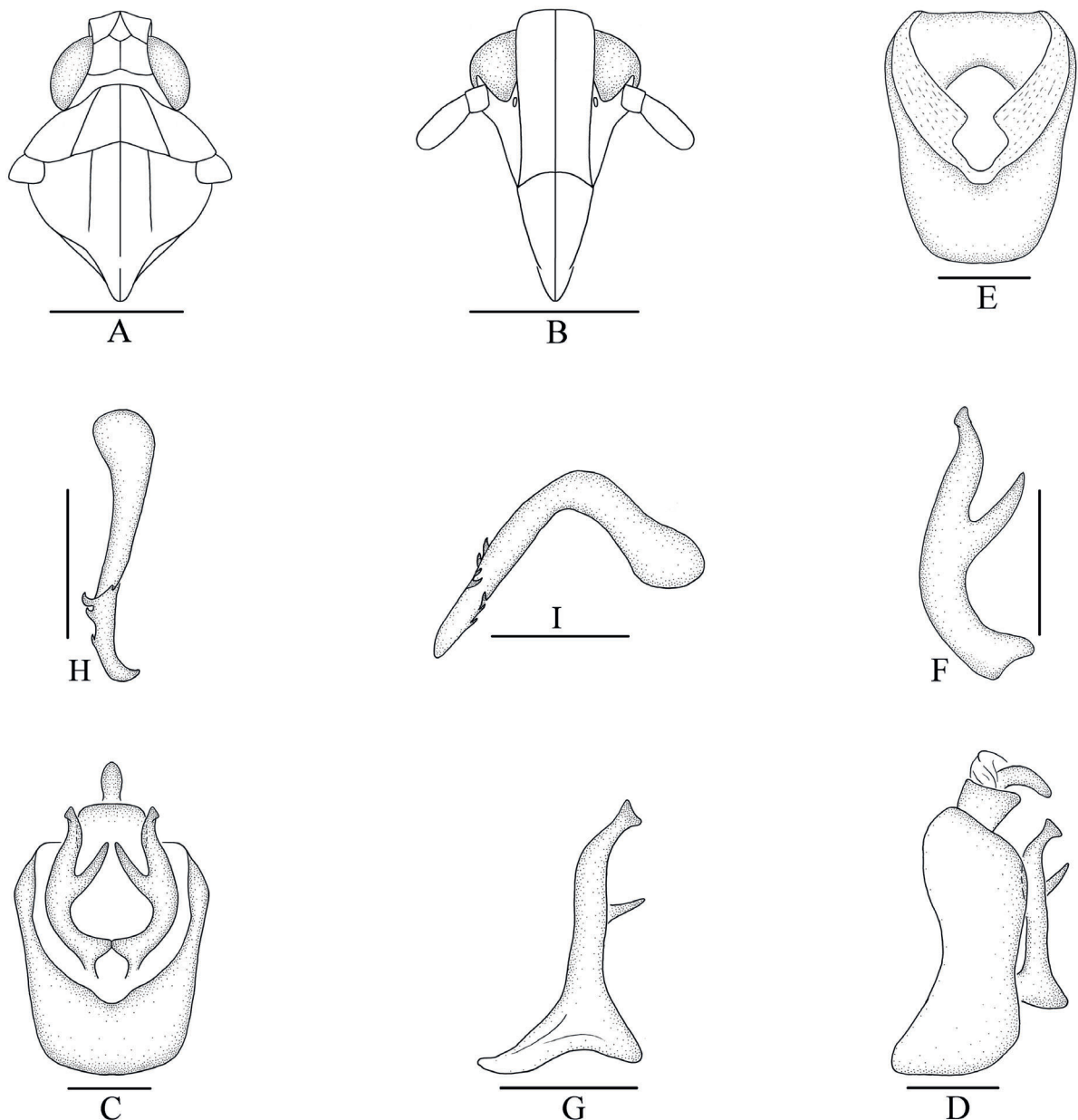


Fig. 2. *Bambusiphaga parvula* sp. nov., ♂, holotype (GUGU-DE-BA-20180801). **A.** Head and thorax, dorsal view. **B.** Face. **C.** Male genitalia, posterior view. **D.** Same, lateral view. **E.** Pygofer, posterior view. **F.** Genital style, posterior view. **G.** Genital style, lateral view. **H.** Aedeagus, posterior view. **I.** Aedeagus, lateral view. Scale bars: A–B = 0.5mm; C–I = 0.2 mm.

with length subequal to width, shorter than second segment (1:3.11). Pronotum (Figs 1C, 2A) as long as vertex. Mesonotum (Figs 1C, 2A) $1.15 \times$ as long as vertex and pronotum together in middle line. Forewings (Fig. 1F) longer in middle line than broad at widest part (3.03: 1), transverse venation located in middle near apex.

MALE GENITALIA. Anal segment (Fig. 2C) ring-like, no process. Pygofer (Fig. 2C–E) in profile with dorsal margin shorter than ventral margin, posterior margin distinctly sinuate; in posterior view opening longer than wide, ventral margin broadly concave, without medioventral process. Genital styles (Fig. 2F–G) moderately long, apex truncated, arched medially, near apex with spinous process. Aedeagus without phyllobase. Phallus (Fig. 2H–I) tubular, broad at base, with some small teeth near apex, in profile (Fig. 2I) curved medially.

Host plant

Bambusoideae.

Distribution

China (Yunnan).

Remarks

This new species is similar to *B. furca* Huang & Tian, 1979 in general appearance, but differs in the following: (1) vertex (Figs 1C, 2A) with median carina distinct (vs vertex with median carina indistinct in *B. furca*); (2) genital styles (Fig. 2F–G) with apex truncated (vs genital styles (Huang & Ding 1979: fig. 11) with apex acute in *B. furca*); (3) aedeagus (Fig. 2H–I) thin, with small teeth near apex, not forked at apex (vs aedeagus (Huang & Ding 1979: fig. 10) stout, without tooth near apex, forked at apex in *B. furca*).

Bambusiphaga angulosa sp. nov.

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Figs 3–4

Diagnosis

Bambusiphaga angulosa sp. nov. can be distinguished from the remaining species of the genus by having the vertex and mesonotum without any dark brown markings, the ventral margin of the anal segment without a process, not incised medially, the pygofer without a spine on the ventral margin, the genital styles without a finger-like process at the base, not forked apically, and the aedeagus without small teeth near the apex, forked at the apex.

Etymology

The specific epithet is derived from the Latin word ‘*angulosa*’, referring to the genital styles having an angular process near the apical $\frac{1}{3}$.

Type material

Holotype

CHINA • ♂; Yunnan, Yingjiang County; 24°44' N, 97°33' E; 20 Aug. 2018; H.X. Li, F.E. Li and N. Gong leg.; on bamboo; GUGU-DE-BA-20180807.

Paratypes

CHINA • 3 ♂♂; same collection data as for holotype; GUGU-DE-BA-20180808 to GUGU-DE-BA-20180810.

Description

MEASUREMENTS. Body length including forewing: male 3.7–3.8 mm (N = 4).

COLORATION. General color yellowish. Eyes and ocelli reddish brown (Fig. 3A–E). Forewings pale yellowish orange, veins yellow (Fig. 3F).

HEAD AND THORAX. Vertex (Figs 3C, 4A) at midline shorter than wide at base (1:1.43), width at apex narrower than at base (1:1.42), anterior margin broadly rounded, lateral and submedian carinae distinct,



Fig. 3. *Bambusiphaga angulosa* sp. nov., ♂, holotype (GUGU-DE-BA-20180807). **A.** Male adult, dorsal view. **B.** Male adult, lateral view. **C.** Head and thorax, dorsal view. **D.** Head and thorax, lateral view. **E.** Face. **F.** Forewing. Scale bars = 0.5 mm.

median carina indistinct. Frons (Figs 3E, 4B) in middle line longer than wide, at widest part about 2.33: 1, as wide at base as at apex, median carina simple. Base of postclypeus (Figs 3E, 4B) wider than apex of frons. Antennae (Figs 3E, 4B) with basal segment with length subequal to width, shorter than second segment (1:3.41). Pronotum (Figs 3C, 4A) slightly longer than vertex medially (1:0.92). Mesonotum (Figs 3C, 4A) 1.48 × as long as vertex and pronotum together in middle line. Forewings (Fig. 3F) longer in middle line than broad at widest part (3.22: 1), transverse venation located in middle near apex.

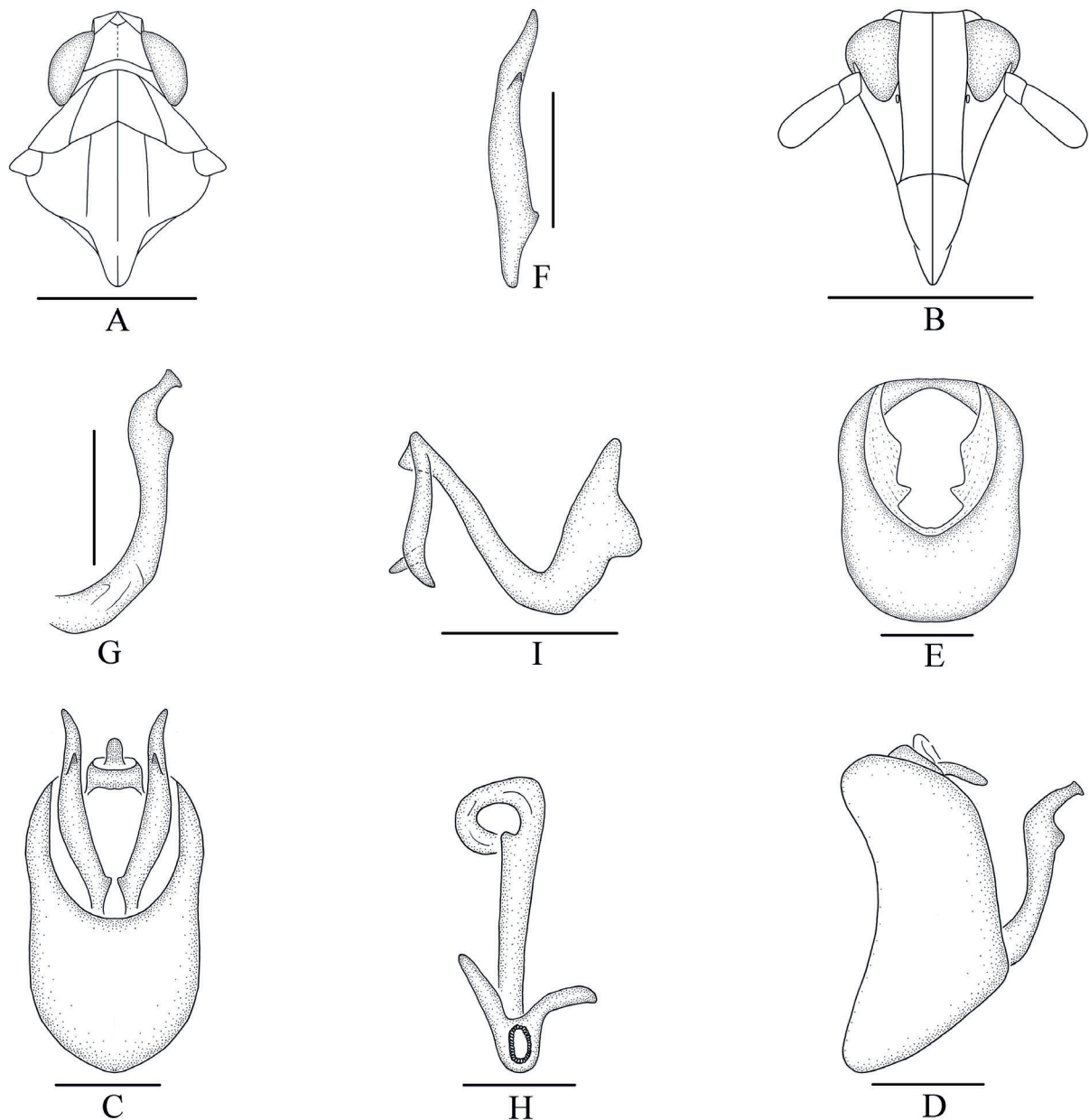


Fig. 4. *Bambusiphaga angulosa* sp. nov, ♂, holotype (GUGU-DE-BA-20180807). **A.** Head and thorax, dorsal view. **B.** Face. **C.** Male genitalia, posterior view. **D.** Male genitalia, lateral view. **E.** Pygofer, posterior view. **F.** Genital style, posterior view. **G.** Genital style, lateral view. **H.** Aedeagus, posterior view. **I.** Aedeagus, lateral view. Scale bars: A–B = 0.5 mm; C–G, I = 0.2 mm; H = 0.1 mm.

MALE GENITALIA. Anal segment (Fig. 4C) short, ring-like, ventral margin without a process. Pygofer (Fig. 4C–E) in profile with dorsal margin shorter than ventral margin, opening in posterior view longer than wide, no process at ventral margin. Genital styles (Fig. 4F–G) in posterior view moderately long, narrow and divergent, lateral margins subparallel, sinuate, tapering apically, with an angular process near apical $\frac{1}{3}$, in profile (Fig. 4G) with truncate apical margin, near apex with a stout process. Aedeagus without phyllobase. Phallus (Fig. 4H–I) slender, very long, tubular, in profile (Fig. 4I) broad at base, narrowing apically, strongly curved dorsally at basal $\frac{1}{3}$ and curved ventrally at apical $\frac{1}{3}$, forked at apex, with a node near apex.

Host plant

Bambusoideae.

Distribution

China (Yunnan).

Remarks

This new species is similar to *B. parvula* sp. nov. in general appearance, but differs in the following: (1) forewings (Fig. 3F) without dark brown mark (vs forewings (Fig. 1F) with a small dark brown mark along cross veins CuP-CuA₁ in *B. parvula* sp. nov.); (2) genital styles (Fig. 4F–G) with a small process near apical $\frac{1}{3}$ (vs genital styles (Fig. 2F–G) with a large process near apical $\frac{1}{3}$ in *B. parvula* sp. nov.); (3) aedeagus (Fig. 4H–I) without spine near apex, forked at apex (vs aedeagus (Fig. 2H–I) with some small spines near apex, not forked at apex in *B. parvula* sp. nov.).

Bambusiphaga nigrigena sp. nov.

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Figs 5–7

Diagnosis

Bambusiphaga nigrigena sp. nov. can be distinguished from the remaining species of the genus by having the vertex without any markings, the pronotum with dark brown markings on lateral areas, the mesonotum with dark brown markings, the forewings with a large black marking at the base, the anal segment with a long ventral process medially, and the pygofer without a medioventral process.

Etymology

The specific epithet is derived from a combination of the Latin root prefix ‘nigr-’ and ‘gena’, referring to the ‘genae’ being dark brown.

Type material

Holotype

CHINA • ♂; Yunnan, Menghai County; 21°91' N, 100°44' E; 23 Jul. 2019; H.X. Li, S.Y. Xu and N. Gong leg.; on bamboo; GUGU-DE-BA-20190701.

Paratypes

CHINA • 7 ♂♂, 2 ♀♀; same collection data as for holotype; GUGU-DE-BA-20190702 to GUGU-DE-BA-20190710 • 5 ♂♂, 3 ♀♀; Yunnan, Ruili County; 24°05' N, 97°96' E; 21 Aug. 2016; L. Yang and X.S. Chen leg.; on bamboo; GUGU-DE-BA-20190711 to GUGU-DE-BA-20190718 • 6 ♂♂, 5 ♀♀; Yunnan, Mengla County; 21°93' N, 101°26' E; 30 Aug. 2017; Q. Luo and Z.X. Zhou leg.; on bamboo; GUGU-DE-BA-20190719 to GUGU-DE-BA-20190729 • 9 ♂♂, 6 ♀♀; Yunnan, Mengla County; 21°93' N,

101°25' E; 11 Aug. 2018; J.K. Long and X.S. Chen leg.; on bamboo; GUGU-DE-BA-20190730 to GUGU-DE-BA-20190744 • 27 ♂♂, 14 ♀♀; Yunnan, Ruili County; 24°07' N, 97°82' E; 23 Aug. 2018; H.X. Li, N. Gong, F.E. Li and Q. Luo leg.; on bamboo; GUGU-DE-BA-20190745 to GUGU-DE-BA-20190785 • 3 ♂♂, 1 ♀; Yunnan, Jinghong County; 21°57' N, 100°67' E; 17 Jul. 2019; H.X. Li, N. Gong, F.E. Li and S.Y. Xue leg.; on bamboo; GUGU-DE-BA-20190786 to GUGU-DE-BA-20190789 • 1 ♂; Yunnan, Mengla County; 21°21' N, 101°71' E; 18 Jul. 2019; H.X. Li leg.; on bamboo; GUGU-DE-BA-20190790.

Description

MEASUREMENTS. Body length including forewing: male 3.2–3.5 mm (N = 10), female: 3.4–3.8 mm (N = 10).

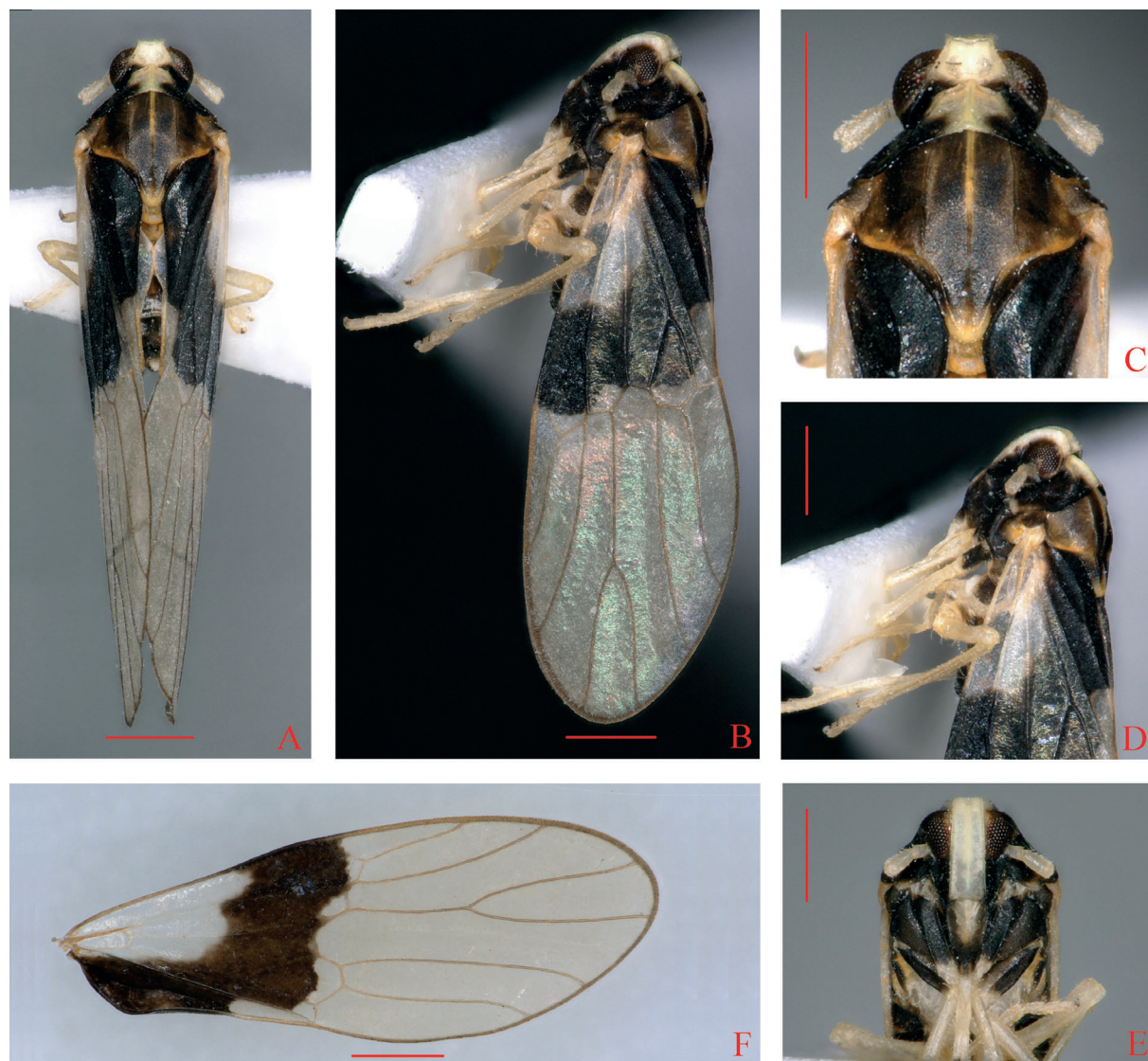


Fig. 5. *Bambusiphaga nigrigena* sp. nov., ♂, holotype (GUGU-DE-BA-20190701). **A.** Male adult, dorsal view. **B.** Male adult, lateral view. **C.** Head and thorax, dorsal view. **D.** Head and thorax, lateral view. **E.** Face. **F.** Forewing. Scale bars = 0.5 mm.

COLORATION. General color yellowish white to yellowish brown, with dark brown markings (Fig. 5). Vertex, frons, rostrum and antennae lightly yellowish white. Genae dark brown. Clypeus (Fig. 5E) yellowish white, anteclypeus and lateral sides of postclypeus dark brown. Eyes and ocelli reddish brown. Pronotum (Fig. 5C) dark brown, central areas of lateral carinae mostly yellowish white. Mesonotum (Fig. 5C) yellow to dark brown, apex of scutellum yellowish white. Forewings (Fig. 5F) pale yellowish white, almost hyaline, with large dark brown marking at basal area. Legs (Fig. 5D–E) yellowish white, except femora of fore legs and median legs dark brown. Abdomen dark brown, except posterior margin of each segment yellowish brown.

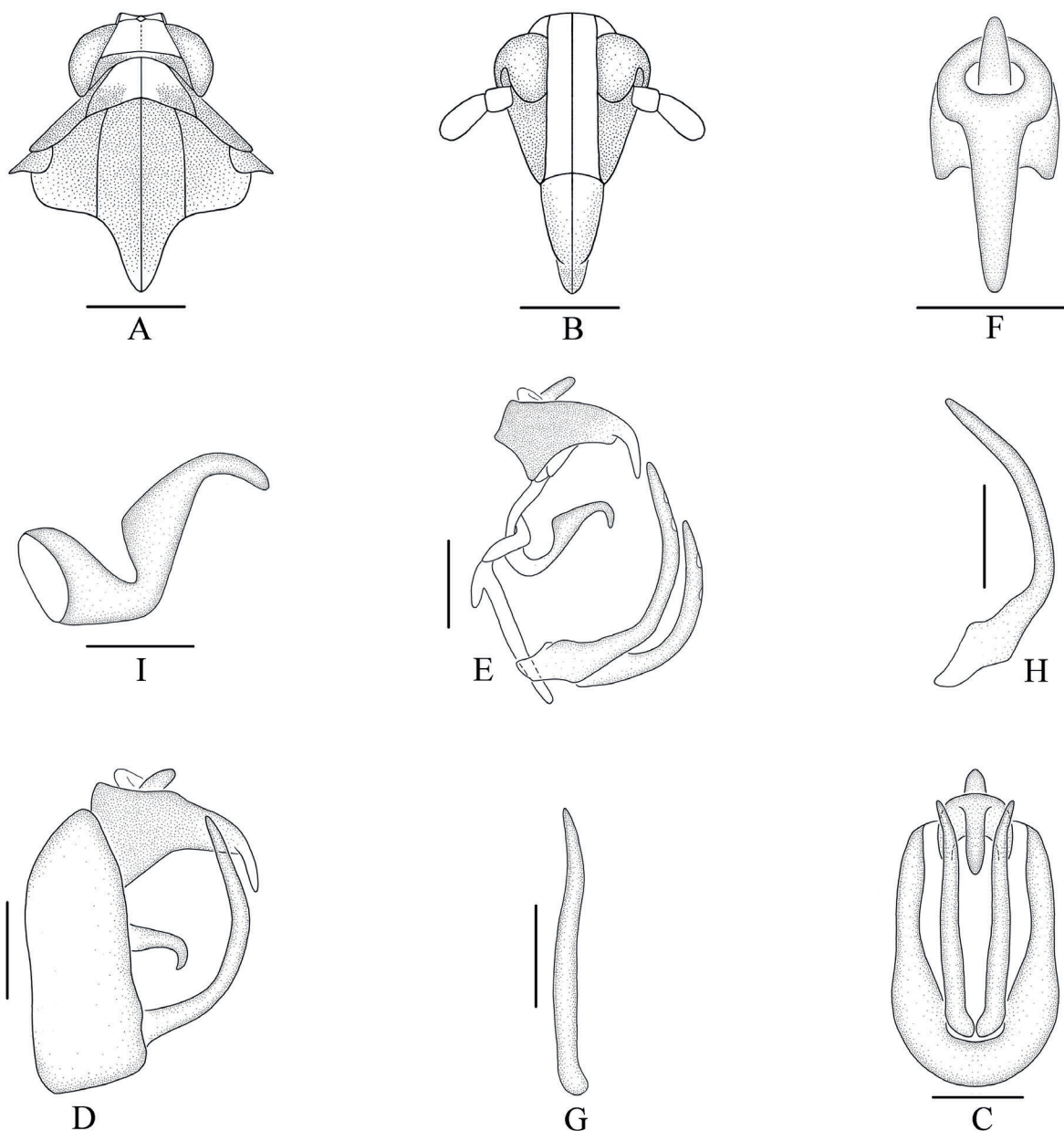


Fig. 6. *Bambusiphaga nigrigena* sp. nov., ♂, holotype (GUGU-DE-BA-20190701). **A.** Head and thorax, dorsal view. **B.** Face. **C.** Male genitalia, posterior view. **D.** Male genitalia, lateral view. **E.** Anal segment, aedeagus and genital style, lateral view. **F.** Anal segment, dorsal view. **G.** Genital style, posterior view. **H.** Genital style, lateral view. **I.** Aedeagus, lateral view. Scale bars: A–B = 0.5 mm; C–I = 0.2 mm.

HEAD AND THORAX. Vertex (Figs 5C, 6A) at midline shorter than wide (1: 1.84), width at apex narrower than at base (1: 1.84), anterior margin truncate, lateral and submedian carinae distinct, median carina indistinct. Frons (Figs 5E, 6B) in middle line longer than wide, at widest part about 2.56: 1, widest at apex, median carina simple. Base of postclypeus (Figs 5E, 6B) as wide apex of frons. Antennae (Figs 5E, 6B) with basal segment $1.15 \times$ as long as wide, shorter than second segment (1: 1.90). Pronotum (Figs 5C, 6A) longer than vertex medially (1.16: 1). Mesonotum (Figs 5C, 6A) $2.28 \times$ as long as vertex and pronotum together in middle line. Forewings (Fig. 5F) longer in middle line than broad at widest part (2.70: 1), transverse venation located in middle near base.

MALE GENITALIA. Anal segment (Fig. 6C, F) ring-like, with a long ventral process medially. Pygofer (Fig. 6C–D) in profile with dorsal margin shorter than ventral margin, posterior margin slightly sinuate; opening in posterior view longer than wide, ventral margin broadly concave, without medioventral process. Genital styles (Fig. 6G–H) in posterior view very long and narrow, lateral margins subparallel, tapering apically, slightly divergent apically; in profile arched medially. Aedeagus without phyllobase. Phallus (Fig. 6I) stout, strongly curved dorsally at basal $\frac{1}{3}$, thin and slightly curved ventrally at apical $\frac{1}{3}$.

Host plant

Bambusoideae.

Distribution

China (Yunnan).

Remarks

This new species is similar to *B. maculata* Chen & Li, 2000 in general appearance, but differs in the following: (1) genae, anteclypeus and lateral sides of postclypeus (Fig. 5E) dark brown (vs genae



Fig. 7. Adult of *Bambusiphaga nigrigena* sp. nov. resting on leaf of bamboo. Photograph by X.S. Chen.

and clypeus (Chen & Li 2000: fig. 2) pale yellowish white in *B. maculata*); (2) anal segment of male (Fig. 6C) with a ventral process medially (vs anal segment of male (Chen & Li 2000: fig. 4) with a ventral process laterally on left side in *B. maculata*); (3) pygofer (Fig. 6C) without medioventral process (vs pygofer (Chen and Li 2000: fig. 8) with medioventral process developed in *B. maculata*); (4) genital styles (Fig. 6G) with apex not forked (vs genital styles (Chen & Li 2000: fig. 7) with apex forked in *B. maculata*).

This new species is also similar to *B. kunmingensis* Yang & Chen, 2011 in general appearance, but differs in the following: (1) forewings (Fig. 5F) with a hyaline macula at basal $\frac{1}{3}$ (vs forewings (Yang & Chen 2011: fig. 3) with entire basal $\frac{1}{3}$ dark brown in *B. kunmingensis*); (2) anal segment of male (Fig. 6C, F) with a long ventral process medially (vs ventral margin of anal segment (Yang & Chen 2011: fig. 6) without a process in *B. kunmingensis*); (3) genital styles (Fig. 6G) without a process (vs inner margin of genital styles (Yang & Chen 2011: fig. 8) with an angular process near apical $\frac{1}{4}$ in *B. kunmingensis*); (4) aedeagus (Fig. 6I) without phyllobase (vs aedeagus (Yang & Chen 2011: fig. 10) with phyllobase in *B. kunmingensis*).

Discussion

Within *Bambusiphaga*, all species except *B. maculata* Chen & Li, 2000 were recovered as monophyletic. *B. maculata* separated from the other members of the genus, sister to *Specinervures basifusca* Chen & Li, 2000. However, *Bambusiphaga* and *Specinervures* Kuoh & Ding, 1980 are distinctly different morphologically; it is unreasonable to transfer *B. maculata* to *Specinervures* based on current classification criteria (Huang *et al.*, 2017). Species in the genus *Bambusiphaga* exhibit morphological diversity in male genitalia. Asche (1983) divided *Bambusiphaga* into 4 species groups (*citricolorata*, *lacticolorata*, *nigropunctata* and *mirostylis*). Later, as the number of species increased, more groups were added. Chen & Liang (2007) added 3 new species groups (*fascia*, *maculata* and *wangmoensis*). Yang & Chen (2011) added 1 new species group (*kunmingensis*) which led to a total 8 groups. Morphologically, *B. citricolorata* belongs to the *citricolorata* group, while *B. furca* and *B. luodianensis* belong to the *nigropunctata* group. However, molecular data suggest that *B. citricolorata* and *B. luodianensis* are more closely related (Huang *et al.* 2017, 2020). The application of molecular phylogenetics has significantly benefited the systematics and taxonomy of Delphacidae. Assessing the interrelationships of species of *Bambusiphaga* demands further intensive study, including more diverse sampling and molecular evidence, which should be the direction of our future efforts.

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