

SHORT COMMUNICATION

A new species and a new record of *Xistrella* from China (Orthoptera: Tetrigidae)

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Abstract. The genus *Xistrella* Bolívar, 1909 (Orthoptera: Tetrigidae) is taxonomically reviewed. It can be easily recognised from other genera in SE Asia, and especially in the People's Republic of China. It is distinctive by antennae inserted below the inferior margin of eye and considerably long; pronotum between the shoulders strongly elevated to obtuse gibbosity or slightly elevated in the posterior part of shoulders. This genus is distributed mainly in China, India, Indonesia, Sri Lanka, Myanmar, Nepal, Malaysia, and the Philippines. One new species, *X. hainanensis* Deng sp. nov. (China: Hainan), is described, and a new record of *X. dubia* (Brunner von Wattenwyl, 1893) from China is given. An annotated identification key to all species of the genus *Xistrella* is provided.

Key words. Orthoptera, Caelifera, Tetrigidae, Metrodorinae, identification key, new species, new records, taxonomy, China

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Introduction

The monotypic genus *Xistrella* was established by BOLÍVAR (1909) with *Xistrella dromadaria* Bolívar, 1909 being the type species by original monotypy. The little-known genus *Xistrella* is a member of the subfamily Metrodorinae within the family Tetrigidae. GÜNTHER (1939) completely revised all the known species of the genus *Xistrella* and provided an identification key to the species. He also described *Xistrella dohrni dohrni* Günther, 1939 from Sumatra and *Xistrella dohrni palawanica* Günther, 1939 from the Philippines, while also moving five species to the genus: two species previously classified in the genus *Xistra* Bolívar, 1887 (*Xistra dubia* Brunner von Wattenwyl, 1893, *Xistra stylata* Hancock, 1907); one species and one subspecies previously classified in the genus *Mazarredia* Bolívar, 1887 (*Mazarredia ophthalmica* Bolívar, 1909, *Mazarredia ophthalmica javanensis* Günther, 1937); and one species previously classified in the genus *Bolotettix* Hancock, 1907 (*Bolotettix inermis* Hancock, 1907). He transferred the subspecies *Mazarredia ophthalmica javanensis* into the genus *Xistrella* and treated it as a valid species, that is: *Xistrella javanensis* (Günther, 1937). Since GÜNTHER (1939), seven

more species of *Xistrella* have been described. SHISHODIA (1991) described *X. arorai* and *X. siangensis* from India; and ZHENG & LIANG (1991) described *X. cliva* and *X. wuyishana* from China. Meanwhile, *Clivitettix motuoensis* Yin, 1984 from China was transferred to the genus *Xistrella* by ZHENG & LIANG (1991). WANG (1999) described *X. hunanensis* from China and INGRISCH (2001) described *X. aruna* from Nepal. BLACKITH (1992) transferred *Coptotettix acuteterminatus* Brunner von Wattenwyl, 1893 into the genus *Xistrella*, but this species does not exhibit the typical characteristics of *Xistrella* (frontal ridge and vertex rounded in profile; antennal groove inserted in front of lower margin of eye); therefore, this paper does not support BLACKITH's (1992) action. STOROZHENKO (2014) transferred two species previously classified in the genus *Pseudogignotettix* Liang, 1990 (*P. guandongensis* Liang, 1990, *P. emeiensis* Zheng, 1995) into the genus *Xistrella*. BLACKITH (1992), SHISHODIA et al (2010) and TUMBRINCK (2015) retransferred *X. inermis* to *Bolotettix*. Thus, to date the genus includes fifteen known species in Southeast Asia, distributed mainly in China, India, Indonesia (Java, Sulawesi, Sumatra), Sri Lanka, Myanmar, Nepal, Malaysia, and the Philippines (CIGLIANO et al. 2019).



Here, a new species and a new record of *Xistrella* collected from China, *X. hainanensis* Deng sp. nov. and *X. dubia* (Brunner von Wattenwyl, 1893), respectively, are described and illustrated; a modified key to all the species of this genus is also provided.

Material and methods

Photography. Grasshopper specimens were examined using a Motic-SMZ-168 stereo-microscope and photographed using an Olympus digital camera with the program CombineZM 1.0.0 (HADLEY 2014). All images were processed with Adobe photoshop CS 11.0.

Terminology and measurements. Morphological terminology and landmark-based measurement method followed those used by ZHENG (2005), DENG et al. (2007), and TUMBRINCK (2014). Terminology is relevant for species differentiation, with the following abbreviations used:

AG	antennal grooves;
AMP	anterior margin of pronotum;
AT	antegenicular tooth;
E	eye;
FA	fastigium;
GT	genicular tooth;
HA	humeral angel;
HW	hind wings;
LLP	lateral lobe of pronotum;
LO	lateral ocelli;
MC	median carina;
OC	occiput;
PC	prozonal carina;
PML	posterior margin of lateral lobe;
PP	pronotal process;
PT1	first segment of posterior tarsus;
PT2	second segment of posterior tarsus;
PT3	third segment of posterior tarsus;
PU	pulvilli;
SD	shoulder;
ST	tibial spines;
TE	tegmen;
TS	tegmina sinus;
VE	vertex;
VS	ventral sinus.

Terminology of pronotal projections follows MUHAMMAD et al. (2018):

FM	frontomedial (where the median carina begins on the anterior margin of the pronotum);
FL1	first frontolateral (anterior prolongation of prozonal carina);
MM1	first metamedial (in the start of metazona, on the median carina);
MM2	second metamedial (after MM1 on the median carina);
MM3	third metamedial (after MM2 on the median carina);
ML	metalateral (projection of the humeral angle, shoulders, where humeral carina meets the lateral one);
PM	promedial (in prozona, on the median carina);
VL	ventrolateral (projection of the lateral lobes).

All measurements are given in millimetres (mm). The following measurements follow TUMBRINCK (2014):

EW	eye width (in frontal or dorsal view);
HFL	hind femur length (from the base to the tip of the knee);
HFW	hind femur width (in its widest part);
PH	pronotum height (from the lowest part of the lateral lobes to the highest part of dorsum);
PL	pronotum length [from the anterior margin (FM included if present) to the tip];

PW	pronotum width (in its widest parts);
SW	scutellum (or frontal ridge) width (between the facial carinae);
VW	vertex width (in frontal view between the eyes, or in dorsal view between the place of the supraocular lobes).

The following measurements follow TAN & ARTCHAWAKOM (2015):

BL	body length (length from the vertex of head to the apical margin of subgenital plate);
HTL	hind tibia length (from knee to the base of the apical spine);
FFL	fore femur length;
FFW	fore femur width (in the middle);
MAL	middle segment of antenna length (7th or 8th segment);
MFL	middle femur length;
MFW	middle femur width (in the middle);
n(HTIS)	number of inner spines on hind tibia;
n(HTOS)	number of outer spines on hind tibia;
OVDL	ovipositor dorsal valve length;
OVDW	ovipositor dorsal valve width (maximum, including denticle);
PAW	prozona width at anterior margin;
PPW	prozona width at posterior margin;
SGPL	subgenital plate length;
SGPW	subgenital plate width;
1stAW	first antennal segment width (in the middle of the segment) = scapus width;
1stTL	first tarsal segment (basal) length;
3rdTL	third tarsal segment (apical) length (without claws).

Type specimens depository. The specimens examined in this study, including all holotypes and paratypes, have been deposited in the following institutions:

BMSYU Biology Museum of Sun Yat-sen University, Guangzhou, China;

EMHU Entomological Museum of Hechi University, Yizhou, China.

Taxonomy and nomenclature. *Xistrella* nomenclature and taxonomy follows OSF (Orthoptera Species File) (CIGLIANO et al, 2019).

Taxonomy

Xistrella Bolívar, 1909

Xistrella Bolívar, 1909: 400. Type species: *Xistrella dromadaria* Bolívar, 1909, by original monotypy.

Xistrella: GÜNTHER (1939: 145); SHISHODIA (1991: 94); BLACKITH (1992: 198); OTTE (1997: 67); JIANG & ZHENG (1998: 305); LIANG & ZHENG (1998: 105); WANG (1999: 200); ZHENG (2005: 131); DENG et al. (2007: 122); STOROZHENKO (2014: 47); DENG (2016: 119).

Redescription. General characters and coloration. Body generally moderately elongate, narrow and smooth. Colouration uniformly dark brown or yellow.

Head not exerted or exerted above pronotal surface. In dorsal view, fastigium of vertex between eyes of variable width – either 1) narrower than or 2) equal to or 3) wider than width of compound eye; anterior margin of fastigium truncate, not surpassing anterior margin of eye; median carina of vertex visible anteriorly; fossulae slightly deep or not; lateral margins of vertex slightly raised above dorsal margin of eyes as horns or not. In frontal view, frontal costa bifurcated between compound eyes, just behind paired ocelli, scutellum (longitudinal furrow) either 1) narrower than or 2) equal to or 3) slightly wider than antennal groove (AG) diameter. In lateral view, frontal ridge concave and invisible between eyes, protruding anteriorly and broadly rounded between antennal grooves; lateral (paired) ocelli

Table 1. Distribution of the species of the genus *Xistrella* Bolívar, 1909 (CIGLIANO et al. 2019).

Species	Distribution
<i>X. arorai</i> Shishodia, 1991	India (Arunachal Pradesh, Meghalaya, Manipur, Sikkim, West Bengal)
<i>X. aruna</i> Ingrisch, 2001	Nepal (Sankhua Sabha)
<i>X. cliva</i> Zheng, 1991	China (Guangxi, Jiangxi)
<i>X. dohrni</i> Günther, 1939	India, Indonesia, Myanmar, Philippines
<i>X. dromadaria</i> Bolívar, 1909	India (Sikkim, West Bengal)
<i>X. dubia</i> (Brunner von Wattenwyl, 1893)	China (Guangxi, Guizhou), Myanmar
<i>X. emeiensis</i> (Zheng, 1995)	China (Sichuan)
<i>X. guandongensis</i> (Liang, 1990)	China (Guangdong)
<i>X. hunanensis</i> Wang, 1999	China (Guangxi, Hunan)
<i>X. javanensis</i> (Günther, 1937)	Indonesia (Java, Sulawesi)
<i>X. motuoensis</i> (Yin, 1984)	China (Xizang, Sichuan)
<i>X. ophthalmica</i> (Bolívar, 1909)	India (Assam), Malaysia
<i>X. siangensis</i> Shishodia, 1991	India (Arunachal Pradesh)
<i>X. stylata</i> (Hancock, 1907)	India (Tamil Nadu), Sri Lanka
<i>X. wuyishana</i> Zheng, 1991	China (Fujian, Zhejiang, Guangdong)

located from lowest third of compound eye height to between lower margins of eyes. Antennae long, filiform, antennal grooves (AG) inserted far below or slightly below inferior margin of compound eyes. Eyes globose.

Pronotum smooth and finely granulated, in dorsal view AMP truncated, small FL1, FM; pronotal discus subulate posteriorly and extending beyond apex of hind femora; dorsum elevated behind shoulders like a hump or flat; pronotal MC of variable shape – either 1) MC of pronotum compresso-elevated, upper margin of pronotum in profile with one to two swellings anterior of shoulders, MM1 like a hump and large, PM small (e.g. *X. stylata*, *X. motuoensis*, *X. hunanensis*, *X. dromadaria* and *X. cliva*) or 2) MC of pronotum straight (e.g. *X. aruna*, *X. dohrni* and *X. ophthalmica*) in profile. PML of pronotum with tegminal and ventral sinus, PML of pronotum produced outwards (e.g. *X. dubia*) or turned downwards (e.g. *X. dromadaria*), or obliquely truncate behind and right angled (VL). Tegmina long oval, apex round. Wings generally extending to apex of pronotal process.

Legs. Fore and middle femora slightly compressed, margins finely serrated, with carinated and straight or undulated dorsal and ventral margins. Hind femora elongate, MC finely serrated; 1stTL and 3rdTL equal in length; all pulvilli of PT1 equal in length.

Differential diagnosis. *Xistrella* can be easily distinguished from other genera of the subfamily Metrodorinae by a vertex not narrowly truncate in frontal view, depressed between the eyes, vertex horn drawn out or not; antennae clearly inserted below the inferior margin of eyes and considerably long; pronotum between the shoulders strongly elevated to an obtuse gibbosity or slightly elevated in the posterior part of shoulders.

Xistrella Bolívar, 1909 is morphologically similar to the genera *Xistra* Bolívar, 1887 and *Mazarredia* Bolívar, 1887, as well as to the genera *Paraphyllum* Hancock, 1913 and *Bermania* Storozhenko, 2012. In *Xistra*, the vertex horn is distinctly raised above the dorsal margin of eyes and the vertex is deeply depressed between eyes in frontal view; pronotum between the shoulders is not elevated to an obtuse gibbosity (in frontal view, the vertex

horn slightly raised above the dorsal margin of eyes or not and the vertex slightly depressed or not depressed between eyes; pronotum between the shoulders generally strongly elevated to an obtuse gibbosity in *Xistrella*). In *Mazarredia*, head is distinctly exerted above the pronotal surface; antennae short, antennal grooves inserted between the ventral margins of the compound eyes (head not exerted or a little exerted above the pronotal surface; antennae long, antennal groove inserted below the ventral margin of eye in *Xistrella*). In *Paraphyllum*, pronotum has strongly raised median carina, usually with leaf-like depression; the anterior margin is produced over the head in profile (pronotum never evenly depressed in a leaf-like pattern, the anterior margin truncated and not produced over the posterior margin of the compound eyes in *Xistrella*). In *Bermania*, pronotum has strongly angularly projecting FM in dorsal view; FM almost reaches the anterior edge of eyes (pronotum in dorsal view with truncated anterior margin; FM is not produced over the posterior edge of eyes).

Species composition. There are 15 species distributed in the tropics and subtropics of China, India, Indonesia (Java, Sulawesi, Sumatra), Sri Lanka, Myanmar, Nepal, Malaysia, and the Philippines (Table 1) (CIGLIANO et al. 2019).

Key to species of *Xistrella* Bolívar, 1909

The following identification key is based upon the keys of GÜNTHER (1939), SHISHODIA (1991), and DENG et al. (2007). *Xistrella emeiensis* (Zheng, 1995) and *X. guandongensis* (Liang, 1990) were described based on larvae; identity of both species is questionable and requires revision. Therefore, these two species are excluded from the identification key.

- 1 Pronotum slightly elevated between or behind shoulders like hump, but not compresso-elevated. 2
- Pronotum flat; in profile upper margin of pronotum straight or undulate or compresso-elevated in form of hump between shoulders. 3
- 2 Vertex as broad as eye; humeral angle obtusely produced; dorsum of pronotum smooth or finely gran-

- ulose; pronotum slightly elevated between shoulders like hump. *X. arorai* Shishodia, 1991
- Vertex slightly narrower than eye; humeral angle roundly produced; dorsum of pronotum granulose and rugulose; pronotum slightly elevated behind shoulders like hump.
..... *X. siangensis* Shishodia, 1991
- 3 In profile upper margin of pronotum straight (see <http://orthoptera.speciesfile.org/Common/basic/ShowImage.aspx?TaxonNameID=1101091&ImageID=151020>). 4
- In profile upper margin of pronotum undulate (Fig. 2C) or compresso-elevated in form of hump between shoulders (Figs 1a-d). 8
- 4 Lateral margins of vertex elevated above upper margin of compound eye (see <http://orthoptera.speciesfile.org/Common/basic/ShowImage.aspx?TaxonNameID=1101091&ImageID=151018>); promedial conspicuous. *X. aruna* Ingrisch, 2001
- Lateral margins of vertex not elevated above level of upper margin of compound eye (see <http://orthoptera.speciesfile.org/Common/basic/ShowImage.aspx?TaxonNameID=1101084&ImageID=213619>); promedial inconspicuous. 5
- 5 Midfemur wider than tegmina, lower margins of middle femora undulate.
..... *X. javanensis* (Günther, 1937)
- Midfemur narrower than or equal in width to tegmina, lower margins of middle femora straight.
..... 6
- 6 Width of vertex equal to width of eye; width of scutellum narrower than diameter of antennal grooves (see <http://orthoptera.speciesfile.org/Common/basic/ShowImage.aspx?TaxonNameID=1101085&ImageID=230732>). *X. ophthalmica* (Bolívar, 1909)
- Width of vertex narrower than width of eye; width of scutellum equal to diameter of antennal grooves (see <http://orthoptera.speciesfile.org/Common/basic/ShowImage.aspx?TaxonNameID=1101089&ImageID=230688>). 7
- 7 Lateral margins of vertex reaching upper margin of eye; hind wings reaching apex of pronotal process.
..... *X. dohrni palawanica* Günther, 1939
- Lateral margins of vertex reaching middle of eye; hind wings far surpassing apex of pronotal process.
..... *X. dohrni dohrni* Günther, 1939
- 8 In profile upper margin of pronotum undulate. 9
- In profile upper margin of pronotum compresso-elevated in form of a hump between shoulders. 10
- 9 Upper margin of pronotum before shoulders with two swellings and undulate in profile, promedial and first metamedial are connected (Fig. 2C); antennae inserted far below inferior margin of eye (Figs 2C,H); lower margins of middle femora undulate.
..... *X. dubia* (Brunner von Wattenwyl, 1893)
- Upper margins of pronotum each with hump before shoulders and hind shoulders in profile, promedial and first metamedial are not connected (Fig. 4B); antennae inserted slightly below inferior margin of eye (Fig. 4C);

- lower margins of middle femora straight.
..... *X. hainanensis* Deng sp. nov.
- 10 Lateral margins of vertex slightly elevated above upper margin of compound eye; lower margins of fore and middle femora undulate. .. *X. stylata* (Hancock, 1907)
- Lateral margins of vertex not elevated above level of upper margin of compound eye; lower margins of fore and middle femora straight. 11
- 11 Vertex narrower than eye; median carina of pronotum compresso-elevated in form of triangular hump between shoulders (Figs 1a-b). 12
- Vertex as broad as eye; median carina of pronotum compresso-elevated in form of arched hump between shoulders (Figs 1c-d). 13
- 12 VL right angle; width of basal part of hump equal to length of tegmina in profile.
..... *X. motuoensis* (Yin, 1984)
- VL obtuse-rounded; width of basal part of hump bigger than length of tegmina in profile.
..... *X. hunanensis* Wang, 1999
- 13 Height of pronotal hump (first metamedial) smaller than width of tegmina; upper margin of pronotum between shoulders slightly arched elevated in profile.
..... *X. wuyishana* Zheng, 1991

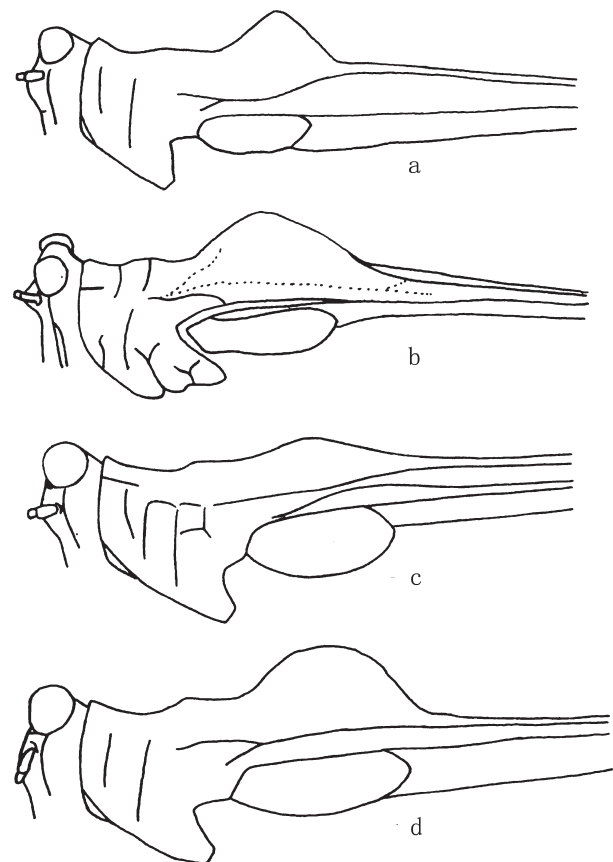


Fig. 1. Morphology of *Xistrella* species. a – *X. motuoensis* Yin, 1984, body, lateral view; b – *X. hunanensis* Wang, 1999, body, lateral view; c – *X. wuyishana* Liang, 1991, body, lateral view; d – *X. cliva* Liang, 1991, body, lateral view. Drawings according to: a – YIN (1984); b – WANG (1999); c, d – ZHENG (1991).

- Height of pronotal hump (first metamedial) larger than or equal to width of tegmina; upper margin of pronotum between shoulders distinctly elevated in form of hump in profile. 14
- 14 PM not distinct; height of pronotal hump (first metamedial) equal to width of tegmina.
..... *X. dromadaria* Bolívar, 1909
- PM distinct; height of pronotal hump (first metamedial) larger than width of tegmina.
..... *X. cliva* Zheng, 1991

***Xistrella dubia* (Brunner von Wattenwyl, 1893)**

(Figs 2–3)

Xistrella dubia Brunner von Wattenwyl, 1893: 108; KIRBY (1910: 27), KIRBY (1914: 56); HANCOCK (1915: 102).

Xistrella dubia: GÜNTHER (1939: 150); OTTE (1997: 67).

Material examined. P. R. CHINA: GUANGXI: 2 ♂♂ 2 ♀♀, Huanjiang (Mulun), 2013-VI-04 (EMHU); 1 ♂ 1 ♀, Rongshui (Yangmeiao), 2015-VIII-13 (EMHU). GUIZHOU: 1 ♂ 2 ♀♀, Libo (Banzhai), 2017-VII-22 (EMHU); 1 ♀, Libo (Maolan), 2015-VII-19 (EMHU).

Redescription. Female. Medium and small size, slender.

Head not exerted above pronotal surface. In dorsal view, fastigium of vertex between eyes 1.4–1.7 times width of an eye, anterior margin of fastigium truncate, not surpassing anterior margin of eye; MC of vertex visible anteriorly; fossula deep; lateral margins of vertex produced upwards. In frontal view, vertex forming U-shaped concavity, lateral margins slightly elevated above upper margin of compound eye, scutellum narrower than diameter of AG. In lateral view, frontal costa straight and invisible between eyes, protruded anteriorly and broadly rounded between AG; lateral ocelli located between or slightly below lower margins of eyes. Antennae long, filiform, inserted far below inferior margin of eye, 14-segmented, MAL about 11–12 times longer than its width. Eyes globose.

Pronotum smooth, in dorsal view AMP truncate or slightly arcuately protruding, FL1 and FM small; MC

entire; subulate posteriorly and extending to middle or to apex of hind tibia; upper margin of pronotum in profile with two swellings anteriorly of shoulders and undulate, PM and MM1 connected, straight behind shoulders; PC parallel, HA arched; interhumeral carinae long and constricted backwards. PML of pronotum with tegminal and ventral sinus, tegminal (upper) sinus very small; PML of pronotum slightly produced outwards, obliquely truncate behind. Tegmina elongate oval, apex round. Hind wings reaching slightly below or reaching or slightly surpassing apex of PP.

Legs. Fore and middle femora compressed and wide; upper and lower MC of fore femora straight, lower MC of middle femora sinuate; midfemur distinctly wider than tegmina. Hind femur stout, its length 2.7 times its wide; margins finely serrated, AT and GT acute. Outer side of hind tibia with five to six ST and inner side with four to five ST. PT1 equal to PT3 in length, three pulvilli of PT1 nearly equal in length, apex obtuse.

Abdomen. Ovipositor narrow and long, length of upper valvulae four times their width, upper and lower valvulae with slender saw-like teeth. SGPL equal to SGPW, middle of posterior margin of subgenital plate triangularly projecting.

Coloration. Body dark brown; antennae dark brown, terminal segment light. Tegmina black, apex white. Hind wing and hind femur dark brown. Hind tibia black, its base and end brown.

Male. Similar to female, but smaller and narrower. Width of vertex 1.3–1.5 times width of eye; AMP slightly arcuately protruding, hind process of pronotum reaching apex of hind tibia. Subgenital plate short, cone-shaped, apex bifurcated.

Measurements (mm). Length of body: ♂ 11.0–11.5, ♀ 13.0–13.5; length of pronotum: ♂ 14.0–14.5, ♀ 14.0–15.5; length of hind femur: ♂ 6.5–7.0, ♀ 8.0–8.5.

Distribution. Myanmar (BRUNNER VON WATTENWYL 1893). **New record from China** (Fig.5).

Table 2. Comparison between *Xistrella hainanensis* sp. nov. and *X. dubia* (Brunner von Wattenwyl, 1893).

<i>Xistrella dubia</i>	<i>Xistrella hainanensis</i> sp.nov.
Head not exerted above pronotal surface.	Head slightly exerted above pronotal surface
VW 1.4–1.7 times EW in female.	VW 1.8 times EW in female
AG inserted far below inferior margin of compound eyes.	AG inserted slightly below inferior margin of compound eyes
MAL about 11–12 times longer than its width.	MAL about 7–8 times longer than its width
LO located between lower margins of eyes.	LO located in lower third of anterior margins of eyes
Upper margin of pronotum before shoulders with two swellings and undulate in profile, PM and MM1 connected.	Upper margin of pronotum with hump before shoulders and hump before hind shoulders in profile, PM and MM1 not connected
Prozonal carina parallel.	Prozonal carina slightly constricted backwards
Interhumeral carinae long and constricted backwards.	Interhumeral carinae short and parallel
Fore and middle femora with undulated ventral margins.	Fore and middle femora with straight ventral margins
MFW wider than tegmina.	MFW narrower than tegmina
1stTL equal to 3rdTL.	1stTL longer than 3rdTL
Tegmina black, apex white.	Tegmina brown
Hind tibia black, base and apex brown.	Hind tibia dark brown
BL: ♀ 13.0–13.5 mm.	BL: ♀ 11.1–11.3 mm
HFL: ♀ 8.0–8.5 mm.	HFL: ♀ 6.5–6.8 mm

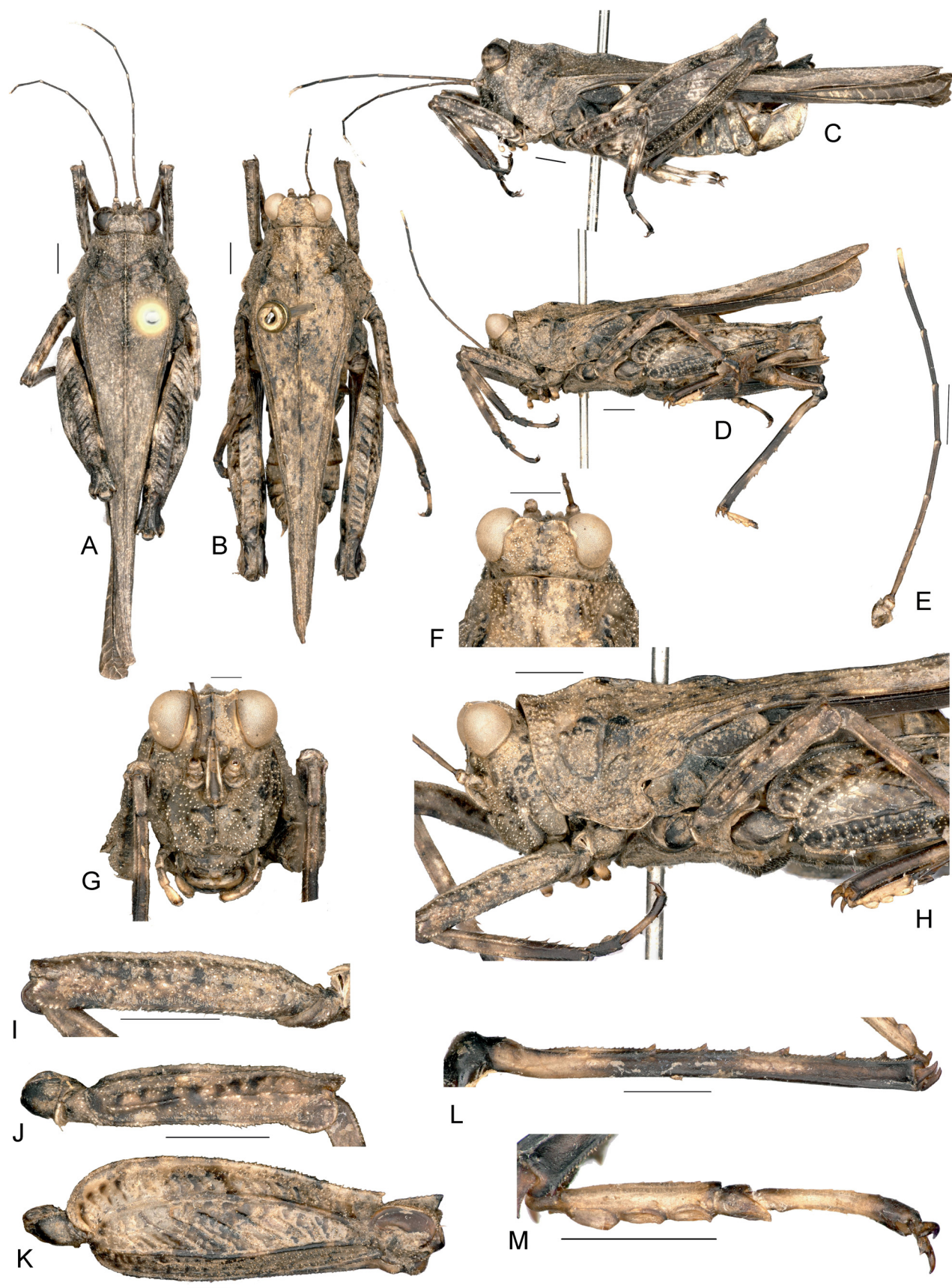


Fig. 2. *Xistrella dubia* (Brunner von Wattenwyl, 1893). A – body of male, dorsal view; B – body of female, dorsal view; C – body of male, lateral view; D – body of female, lateral view; E – right antenna; F – head, dorsal view; G – head, frontal view; H – head and pronotum, lateral view; I – left fore femur, lateral view; J – left middle femur, lateral view; K – left hind femur, lateral view; L – left hind tibia, dorsal view; M – left posterior tarsi, lateral view. Scale bar = 1 mm.

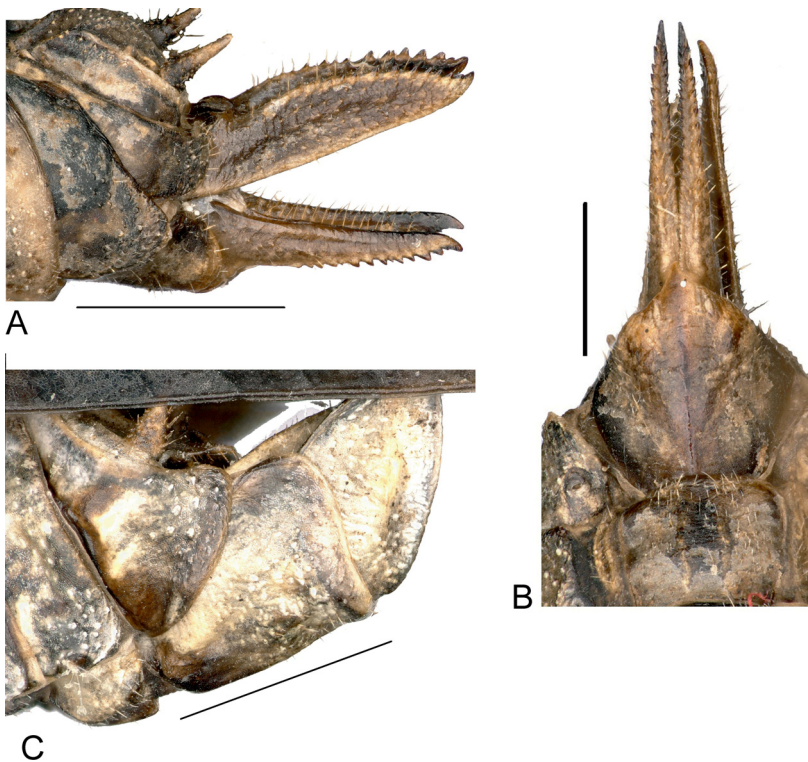


Fig. 3. *Xistrella dubia* (Brunner von Wattenwyl, 1893). A – ovipositor of female, lateral view; B – female subgenital plate, ventral view; C – male subgenital plate, lateral view. Scale bar = 1 mm.

Xistrella hainanensis Deng, sp. nov.

(Fig. 4)

Type material. HOLOTYPE: ♀, P. R. CHINA: HAINAN: Changjiang, 13 November 1964, collected by Ji-Cai LI (BMSYU). PARATYPES. P. R. CHINA: HAINAN: 1 ♀, same data, type locality (BMSYU); 2 ♀♀, Lingshui, 29 December 1963, collected by Ji-Cai LI (BMSYU).

Description. Female. Medium or small size, slender.

Head slightly exerted above pronotal surface. Fastigium of vertex between eyes 1.8 times width of eye in dorsal view, anterior margin of fastigium truncate, not surpassing anterior margin of eye; MC of vertex visible anteriorly; fossula deep; lateral margins elevated up to level of upper margin of compound eye as horns, scutellum narrower than diameter of antennal groove (AG). In lateral view, frontal costa concave and invisible between eyes, protruded anteriorly and broadly rounded between AG; lateral ocelli located between lowest thirds of inner anterior margins of eyes. Antennae long, filiform, inserted slightly below inferior margin of eye, upper margin of AG at level of lower margin of compound eye; 14-segmented; MAL about 7–8 times longer than MAW. Eyes globose, slightly exerted above pronotal surface.

Pronotum very long (macropronotal state), surpassing abdominal apex and extending up to apex of hind tibia. Pronotum smooth, finely granulated; in dorsal view anterior margin truncate; MC entire; subulate posteriorly; in profile, upper margin of pronotum with two humps: one before shoulders and the other one before hind shoulders, PM and MM1 not connected, then straight; PC slightly constricted backwards, HA arched; interhumeral carinae short and parallel. PML of pronotum with tegminal and ventral sinus, PML of pronotum produced outwards, with truncated apex. Tegmina elongate oval, apex round. Hind wings slightly surpassing apex of PP.

Legs. Fore and middle femora compressed and wide. Upper and lower carinae of fore and middle femora straight; middle femur narrower than tegmina. Hind femur stout, length 3.3 times its width; margins finely serrated, AT and GT in right angle. Outer side of hind tibia with six to seven ST and inner side with four to five ST. 1stTL longer than 3rdTL, three pulvilli of PT1 equal in length, apex obtuse.

Abdomen. Ovipositor narrow and long, length of upper valvulae four times their width, upper and lower valvulae with slender saw-like teeth. SGPL equal to SGPW, middle of posterior margin of subgenital plate triangularly projecting.

Coloration. Body dark brown. Hind wing and hind femur dark brown. Hind tibia dark brown.

Male. Unknown.

Measurements (mm). Length of body: 11.1–11.3; length of pronotum 14.5–14.7; length of hind femur 6.5–6.8.

Differential diagnosis. *Xistrella hainanensis* can be easily distinguished from other species of the genus by upper margin of pronotum with a hump both anterior and posterior of shoulders; PM and MM1 are not connected. The species appears to be related to *X. dubia*, but is easily distinguished by morphological characters shown in Table 2.

Etymology. The new species was named after the type locality, Hainan, China; adjective.

Distribution. China (Hainan) (Fig. 5).

Note. *Xistrella hainanensis* Deng was proposed in DENG's (2016) PhD Dissertation, which has not been published according to the criteria of availability (ICZN 1999: Art. 8.1). The name *X. hainanensis* Deng is made available in this paper.

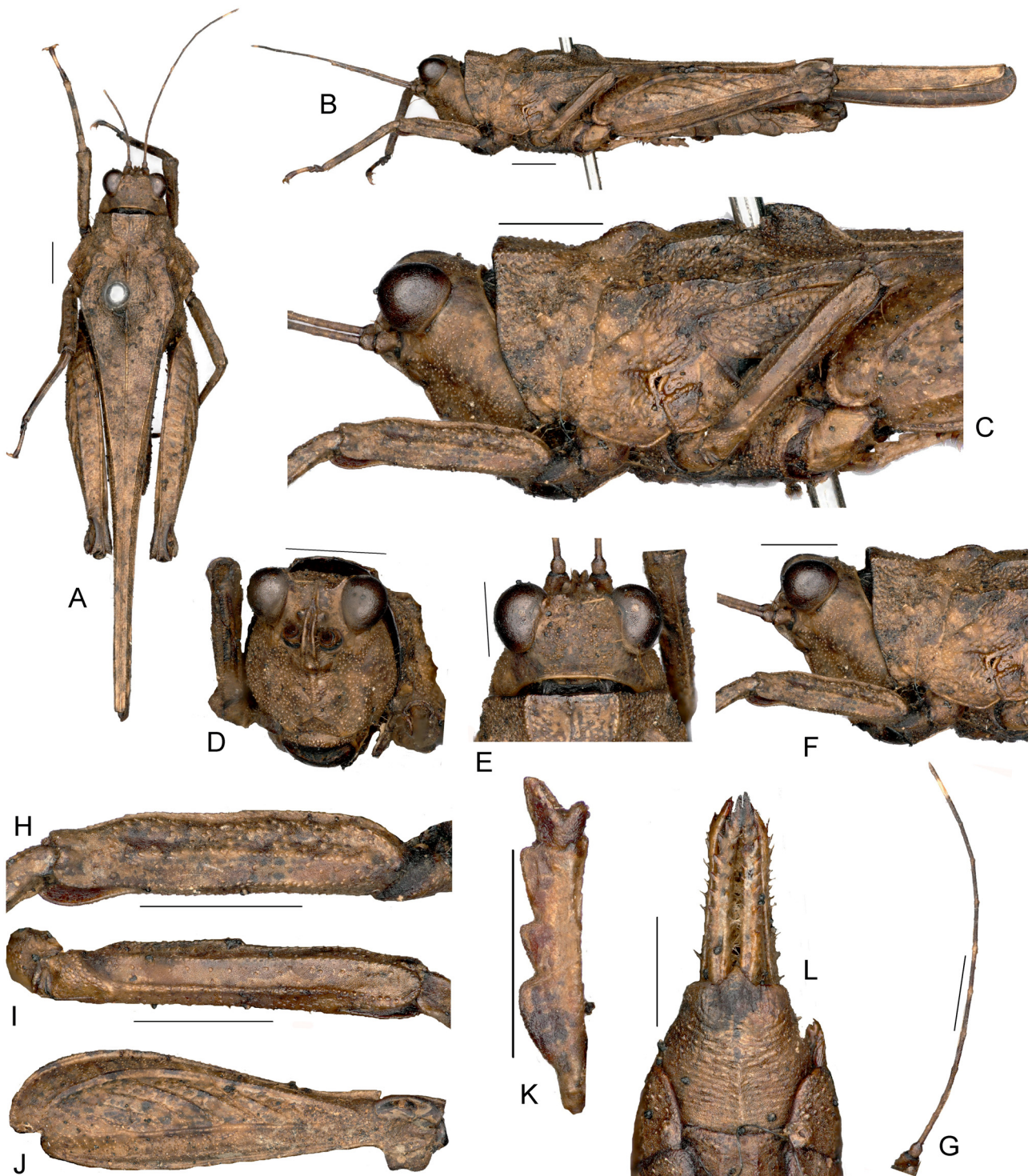


Fig. 4. *Xistrella hainanensis* Deng, sp. nov., female, holotype: A – body, dorsal view; B – body, lateral view; C – head and pronotum, lateral view; D – head, frontal view; E – head, dorsal view; F – head, lateral view; G – right antenna; H – left fore femur, lateral view; I – left middle femur, lateral view; J – left hind femur, lateral view; K – left posterior tarsi, lateral view; L – subgenital plate, ventral view. Scale bar = 1 mm

Discussion

The morphology of Metrodorinae is not homogeneous. The subfamily Metrodorinae is probably a polyphyletic family and is in need of revision. The genus *Xistrella* can be easily recognised from other genera in SE Asia, and especially in the People's Republic of China. It is distinctive by antennae inserted far below the inferior margin of eye and median carina of pronotum generally compresso-elevated

in the form of a hump between shoulders in profile. Shape of the median carina of the pronotum is characteristic and differs among species. Some species do not have highly elevated median carina or other parts of the pronotum (e.g. *X. javanensis*), while other species have this carina highly elevated (e.g. *X. cliva*, *X. humanensis*, *X. dromadaria*).

Xistrella species are usually characterized by the antennae inserted far below the inferior margin of eye, but

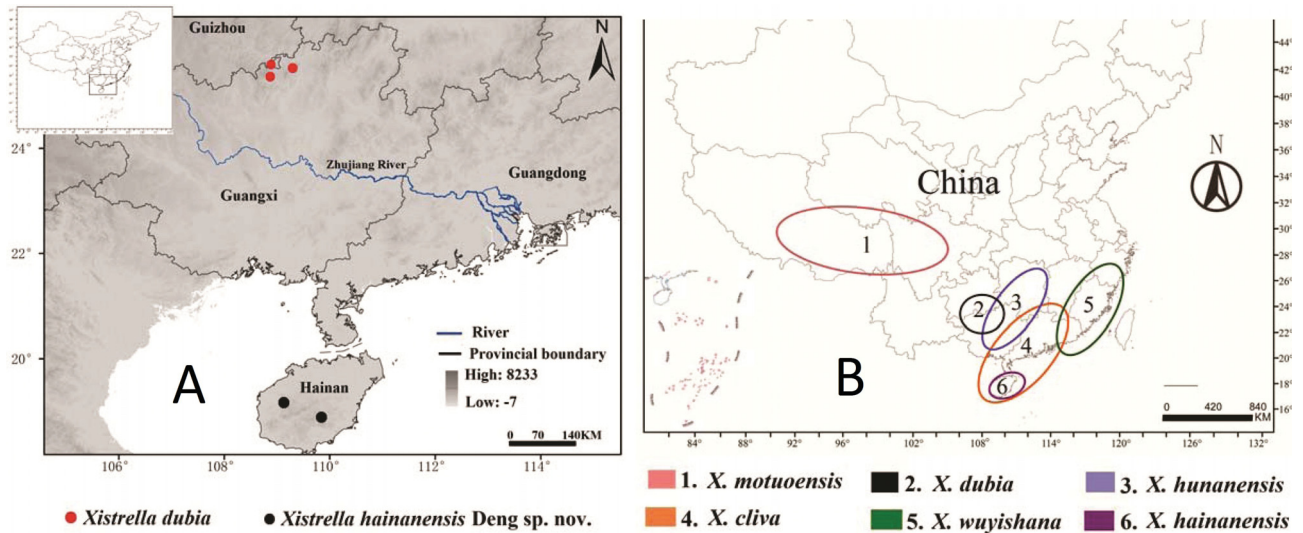


Fig. 5. Geographic information of *Xistrella* in China. A – localities of *X. dubia* (Brunner von Wattenwyl, 1893) and *X. hainanensis* Deng sp. nov.; B – geographic distribution of *Xistrella* species in China.



Fig. 6. Habitats of *Xistrella* species in China. A–B – *X. cliva* Liang, 1991 (Hainan, Qiongzong, Limushan). C–D – *X. dubia* (Brunner von Wattenwyl, 1893) (Guangxi, Huanjian, Mulun). E–F – *X. hunanensis* Wang, 1999 (Guangxi, Longsheng, Huaping).

antennae are inserted slightly below the inferior margin of eye in *Xistrella hainanensis* sp. nov. Although the antennal position of *X. hainanensis* is not the same as that of other species of the genus *Xistrella*, we place this new species in *Xistrella* based on its great similarity to *X. dubia*. Additional characteristics support this placement: frontal costa is concave and invisible between eyes in lateral view; upper margin of pronotum has a hump both anteriorly and posteriorly of shoulders.

There are six species of this genus that have been found in China and distributed mainly in Xizang, Sichuan, Guangxi, Guizhou, Hunan, Jiangxi, Fujian, Zhejiang, Guangdong, and Hainan (see Fig. 5). They like to live in tropical forests or karst rain forest sands, often being found in grass or rotten wood (Fig. 6).

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