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Revision of subfamily Mesitiinae (Hymenoptera, Bethylidae) from China

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Abstract. The species of Mesitiinae (Bethylidae) from China are revised and 20 species belonging to five genera are recognized. The following eleven new species are described: *Heterocoelia curtisulcus* sp. nov., *H. unicolor* sp. nov., *H. varicolor* sp. nov., *H. remota* sp. nov., *Incertosulcus afoveatus* sp. nov., *I. exilisulcus* sp. nov., *Sulcomesitius angustifrons* sp. nov., *S. latibilobatus* sp. nov., *S. sparsulus* sp. nov., *Zimankos acutulus* sp. nov. and *Z. hamulosus* sp. nov. Two new synonymies are proposed: *Heterocoelia sinensis* Xu & He, 2006 is synonymized with *H. zhaoi* Xu & He, 2006, and *Sulcomesitius rectus* Xu, He & Terayama, 2003 with *Zimankos cambodianus* (Móczár, 1976). Two species are transferred from *Sulcomesitius* to *Heterocoelia*, resulting in *H. punctulata* (Xu, He & Terayama, 2003) comb. nov. and *H. neomoczari* (Barbosa & Azevedo, 2018) comb. nov. Two species are transferred from *Heterocoelia* to *Sulcomesitius,* resulting in *S. zhaoi* (Xu & He, 2006) comb. nov. and *S. breviculus* (Xu & He, 2003) comb. nov. Furthermore, *Zimankos mahunkai* (Móczár, 1981) is recorded from China for the first time.

Keywords. China, Chrysidoidea, Mesitiinae, new species, new combination, new synonym, key.

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Introduction

Specimens of Mesitiinae Kieffer, 1914 are the least collected of all Bethylidae Haliday, 1839 (Hymenoptera, Chrysidoidea) and the subfamily contains nearly 200 species in 19 genera (Azevedo

et al. 2018; Barbosa & Azevedo 2019; Barbosa *et al*. 2022; Móczár 1984). This subfamily is mainly distributed in the Old World, with the exception of *Australomesitius* which is distributed in the Australian Region.

The Mesitiinae can be distinguished from other subfamilies within Bethylidae by having the metasomal segment II distinctly longer than subsequent segments, the dorsal pronotal area usually with a median pronotal sulcus and the metapectal-propodeal complex (MPC) usually with posterior propodeal projections (Azevedo *et al.* 2018). During the 20th century, the classification of mesitiine genera was mainly based on female characteristics. However, because of the sexual dimorphism in this subfamily, especially in some important diagnostic characters for recognizing genera, e.g., the shape of the antenna, and the sculpture of the pronotum and mesonotum, the males are hard to identify to genus. Argaman (2003) reviewed this subfamily and argued that the setae covering the male flagellomeres, the general shape of the hypopygium and the placement of the anterior ocellus could be unambiguous characters for classifying males to genus. Argaman's redefinitions of mesitiine genera are partly accepted by contemporary researchers (Azevedo *et al.* 2018), despite the fact that creating genera for the different sexes is problematic. The Chinese members of Mesitiinae were revised by Xu *et al*. (2003) and Xu & He (2006) based on a limited number of specimens and without accounting for the differences in male hypopygia and genitalia. Considering both limitations mentioned above, a new revision of the species of this subfamily from China is needed. For the present study, the types of species known from China, as well as additional mesitiine specimens throughout China, were examined as the basis of an updated taxonomic treatment of Chinese mesitiine species. This paper includes descriptions of new species, re-descriptions of the known species, keys for genera and species known from China, and a brief discussion on the variation of male genitalia within genera as well as the distribution of Mesitiinae in China.

Material and methods

Specimens

The specimens examined in this study were collected using a sweep net, Malaise traps, and flight interception traps. The material examined is deposited in the following collections:

IZCAS = Institute of Zoology, Chinese Academy of Sciences, Beijing, China
ZJUH = Parasitic Hymenoptera Collection of Zhejiang University, Hangzhou, China

Dissections and measurements

Male genitalia were dissected using an apically curved micro insect pin, and subsequent cleaning of hypopygium and genitalia was done according to the method of Martinelli *et al*. (2017). The dissected hypopygium and genitalia were transferred to a microtube with glycerin.

The abbreviations used for morphological terms and biometric measurements are as follows:

AOL = width between anterior and posterior ocellus, measured as minimum length in antero-dorsal view
Cu_2v = cubital vein of fore wing
DAO = diameter of anterior ocellus, measured in antero-dorsal view
DEV = distance between imaginary top line of eyes and vertex crest in antero-dorsal view
DPV = distance between posterior ocelli and vertex crest in antero-dorsal view
LE = maximum length of eye in antero-dorsal view
LH = length of head, measured in lateral view, from apex of clypeus to vertex
MPC = metapectal-propodeal complex

OOL	=	shortest distance from a posterior ocellus to nearest eye margin
POL	=	posterior ocellus line, measured as minimum width between posterior ocelli in antero-dorsal view
PPP	=	posterior propodeal projection
Sc+R_2v	=	subcostal + radial vein of fore wing
S1, S2, etc.	=	metasomal sternum 1, 2, etc.
T1, T2, etc.	=	metasomal tergum 1, 2, etc.
WF	=	minimum width of frons, measured in antero-dorsal view
WH	=	maximum width of head including eyes, measured in antero-dorsal view
WOT	=	maximum width of ocellar triangle including ocelli, measured in antero-dorsal view
2r-rs&Rs_2v	=	second radial across vein & radial sector vein of fore wing

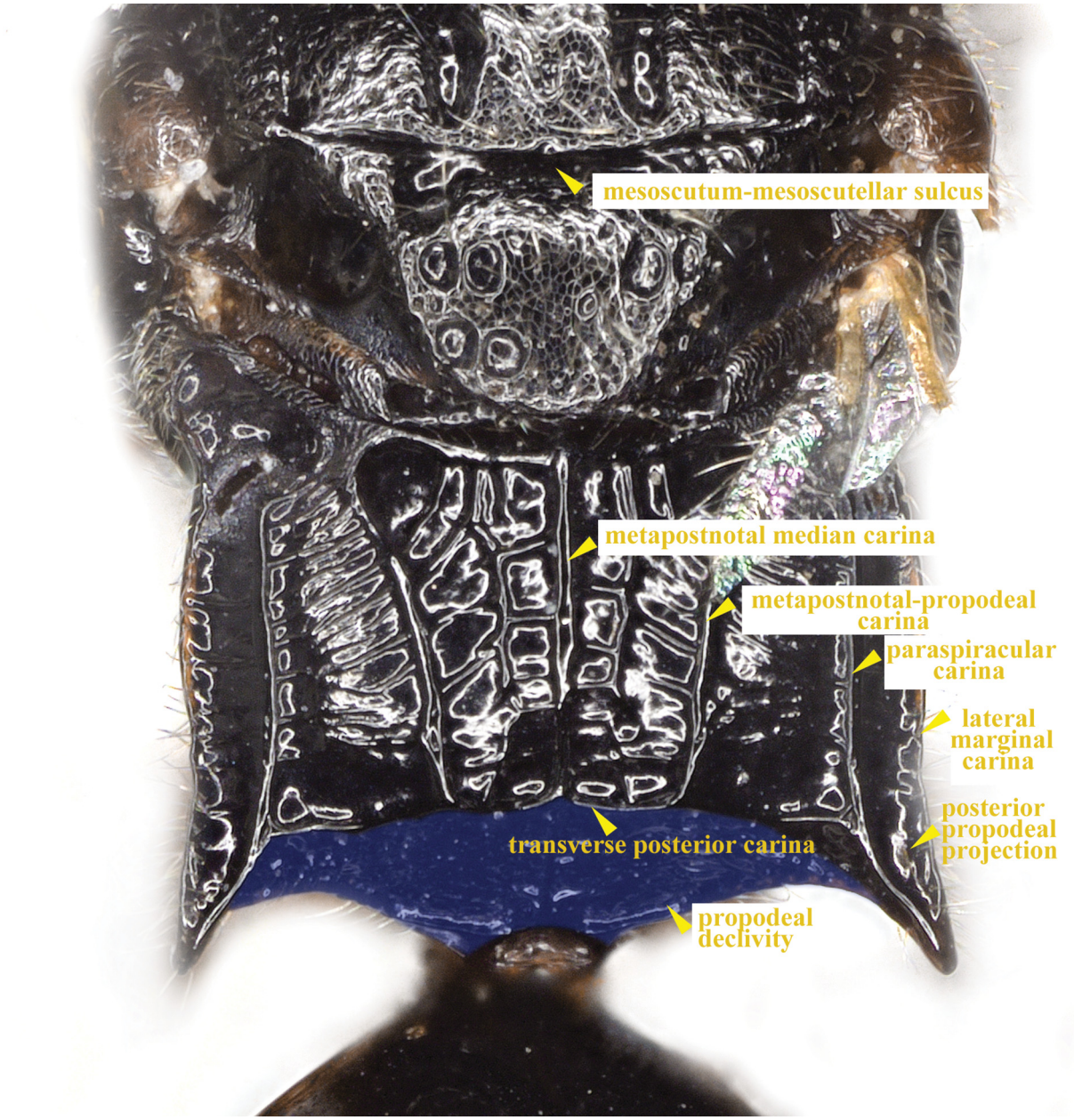

Fig. 1. Mesoscutellum and MPC.

Images and processing

A Nikon stereo microscope (SMZ800N) was used for morphological examination. The biometric measurements and the photos of external and genitalia characters were taken through a Keyence (VHX-7000) digital microscope. The photos were partly enhanced and laid out on a plate using Adobe Photoshop 2023.

Terminology

Morphological terminology and part of the abbreviations for morphological terms follow Lanes *et al.* (2020). Some of the terminologies used for the features of the MPC are shown in Fig. 1.

Taxonomic results

Class Insecta Linnaeus, 1758
Oder Hymenoptera Linnaeus, 1758
Superfamily Chrysidoidea Latreille, 1802
Family Bethylidae Haliday, 1839

Subfamily **Mesitiinae** Kieffer, 1914

Mesitiini Kieffer, 1914: 288.
Mesitiinae Berland, 1928: 108. Type genus: *Mesitius* Spinola, 1851.

Diagnosis

Head and mesosoma usually densely foveolate; malar space projected; contour of eye protruding; presence of anterior depression of occiput; ventral half of mesoccipital carina angled. Median pronotal sulcus usually present. Presence of space between tegula and mesoscutum; notauli developed, usually converging posteriorly. Presence of metapostnotal depression; metapostnotal-propodeal carina usually present and converging posteriorly; paraspiracular carina usually present, when absent then also PPP absent. Second metasomal segment distinctly longer than other segments and at least half as long as metasoma in dorsal view. Male genitalia with: genital ring projected; gonostipes and basivolsella fused; harpe bilobate apically.

Key to the genera of the subfamily Mesitiinae from China (modified after Azevedo *et al.* 2018)

1. Female 2
– Male 3

2. Median mesonotal sulcus well developed on apical half of mesoscutum (Fig. 12E); anterior ocellus usually entirely anterior to imaginary top line of eyes in antero-dorsal view (Fig. 10B) ..... ***Sulcomesitius*** Móczár, 1970
– Median mesonotal sulcus absent, mesoscutum broadly impressed in middle of apical half (Figs 6E, 7E); anterior ocellus usually crossing imaginary top line of eyes in antero-dorsal view (Fig. 5B) ..... ***Heterocoelia*** Dahlbom, 1854

3. PPP absent ..... ***Metrionotus*** Móczár, 1970
– PPP present 4

4. Posterior margin of hypopygium incurved with branches broad and short, less than 0.3 × length of hypopygium (Figs 3H, 8G, 9H) 5
– Posterior margin of hypopygium deeply incurved with branches narrow and long, usually more than 0.4 × length of hypopygium (Figs 11H, 13H, 14H) 6

5. Antennal setae long, longer than width of flagellomere (Figs 8B, 9C); aedeagus usually with apical sickle process ..... ***Incertosulcus*** Móczár, 1970
– Antennal setae short, about one-third width of flagellomere (Fig. 3C); aedeagus without apical sickle process ..... ***Heterocoelia*** Dahlbom, 1854

6. Dorsal pronotal area usually with anterolateral corner distinctly projected (Fig. 16D); basal part of hypopygium with lateral margin distinctly incurved and posterior branches of hypopygium usually filamentary (Figs 17I, 18I) ..... ***Zimankos*** Argaman, 2003
– Dorsal pronotal area usually with anterolateral corner weakly projected (Fig. 11D); basal part of hypopygium with lateral margin usually parallel and posterior branches of hypopygium lobose (Fig. 15H) ..... ***Sulcomesitius*** Móczár, 1970

Genus ***Heterocoelia*** Dahlbom, 1854

Heterocoelia Dahlbom, 1854: 21. Type species: *Cleptes nigriventris* Dahlbom, 1845 (subsequent designation in Bodenstein 1939: 127).
Codorcas Nagy, 1972: 10–12. Type species: *Mesitius cursor* Kieffer, 1906. Synonymized with *Heterocoelia* in Azevedo *et al.* 2018: 191.
Hamusmus Argaman, 2003: 72. Type species: *Mesitius punctatus* Kieffer, 1906. Synonymized with *Heterocoelia* in Azevedo *et al.* 2018: 191.
Ukayakos Argaman, 2003: 68. Type species: *Mesitius carcelli obscurus* Kieffer, 1906 (in Kieffer & Marshall, 1904–1906). Synonymized with *Heterocoelia* in Azevedo *et al.* 2018: 191.

Diagnosis

Flagellomeres with setae dense and short (shorter than half-width of flagellomere); frons and dorsal area of pronotum densely foveolate. Median pronotal sulcus present. Median mesonotal sulcus usually absent (♀). Male hypopygium longer than wide with posterior branches broad and short; basal part of hypopygium with lateral and anterior margin incurved. Male genitalia with dorsal harpe S-shaped.

Host

Larva of *Cryptocephalus sinaita moricei* Pic, 1908 (Coleoptera, Chrysomelidae) (Argaman 2003).

Distribution

Afrotropical, Oriental and Palaearctic Regions.

Key to the Chinese species of the genus *Heterocoelia* Dahlbom, 1854

1. Male: flagellomeres not thickened, at least 1.50 × as long as wide (Fig. 2C) 2
– Female: antenna usually thickened and shorter (Fig. 4C) 3

2. Mesoscutum with median mesonotal sulcus on apical half ..... ***H. curtisulcus*** sp. nov.
– Mesoscutum without median mesonotal sulcus .....
..... ***H. neomoczari*** (Barbosa & Azevedo, 2018) comb. nov.

3. PPP with apical margin acute in lateral view; T4–5 entirely yellowish brown .....
..... ***H. punctulata*** (Xu, He & Terayama, 2003) comb. nov.
– PPP with apical margin truncate in lateral view; T4–5 mostly dark brown 4

4. Legs reddish brown ..... ***H. unicolor*** sp. nov.
– Legs dark brown, tibiae basally and tarsi yellowish brown 5

5. Distance between 1st and 2nd hamuli 2.0 × distance between 2nd and 3rd hamuli of hind wing; apex of PPP rounded in lateral view ..... ***H. remota*** sp. nov.
– Distance between 1st and 2nd hamuli equal to distance between 2nd and 3rd hamuli of hind wing; apex of PPP truncate in lateral view ..... ***H. varicolor*** sp. nov.

Heterocoelia curtisulcus sp. nov.
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Fig. 2

Diagnosis

This new species can be recognized by its having flagellomeres with dense setae shorter than one-third of width of flagellomere; median pronotal sulcus present and not foveolate; median mesonotal sulcus present near posterior margin of mesoscutum; PPP equal to or slightly longer than its width at base; hypopygium longer than wide with anterior margin broad and posterior branches short; genitalia with dorsal harpe narrower than ventral harpe.

This new species is similar to *H. neomoczari* (Barbosa & Azevedo, 2018) in having flagellomere I less than 2.0 × length of flagellomere II. However, it can be distinguished by having median pronotal sulcus not foveolate (distinctly foveolate in *H. neomoczari*); median mesonotal sulcus present (absent in *H. neomoczari*); PPP with apical margin rounded in lateral view (acute in *H. neomoczari*).

Etymology

The specific epithet '*curtisulcus*' is a combination of the Latin words '*curtus*' ('short') and '*sulcus*'('groove') referring to the median mesonotal sulcus of this species present on the posterior third of the mesoscutum.

Material examined

Holotype
CHINA – **Shandong** • ♂; Laoshan; 3 Aug. 1995; Ping Cai leg.; ZJUH 958281.

Paratype (1 ♂)
CHINA – **Shandong** •1 ♂; Laoshan; 4 Aug. 1995; Junhua He leg.; ZJUH 955913.

Description

Male

Measurements (n = 2). Body length 4.66–5.02 mm; fore wing length 2.65–3.15 mm; LH 1.07–1.09 × WH; WF 1.67–1.74 × LE; LE 0.99–1.02 × DEV; POL 1.62–1.70 × AOL; OOL 0.95–1.01 × WOT; DPV 1.90–2.14 × DAO; median length of pronotum 0.53–0.54 × its width along posterior margin; length of hypopygium 1.73–1.79 × its width; length of posterior branches of hypopygium 0.13–0.16 × length of hypopygium.

Colouration. Black. Mandible dark brown, teeth brown; maxillary and labial palpi brown. Antenna brown, scape blackish brown. Legs brown, coxae and femora dark brown, tarsi yellowish brown. Fore wing hyaline, light brown; veins and pterostigma brown. Trochanters, tibiae apically and tarsi yellowish brown. Mesosoma blackish brown. Metasomal segments brown apically.

Pubescence. Body with short setae, denser on ventral surface. Antenna with short appressed setae, 0.25 × width of flagellomere (Fig. 2C). Eye with sparse short setae, nearly 4.0 × diameter of an ommatidium.

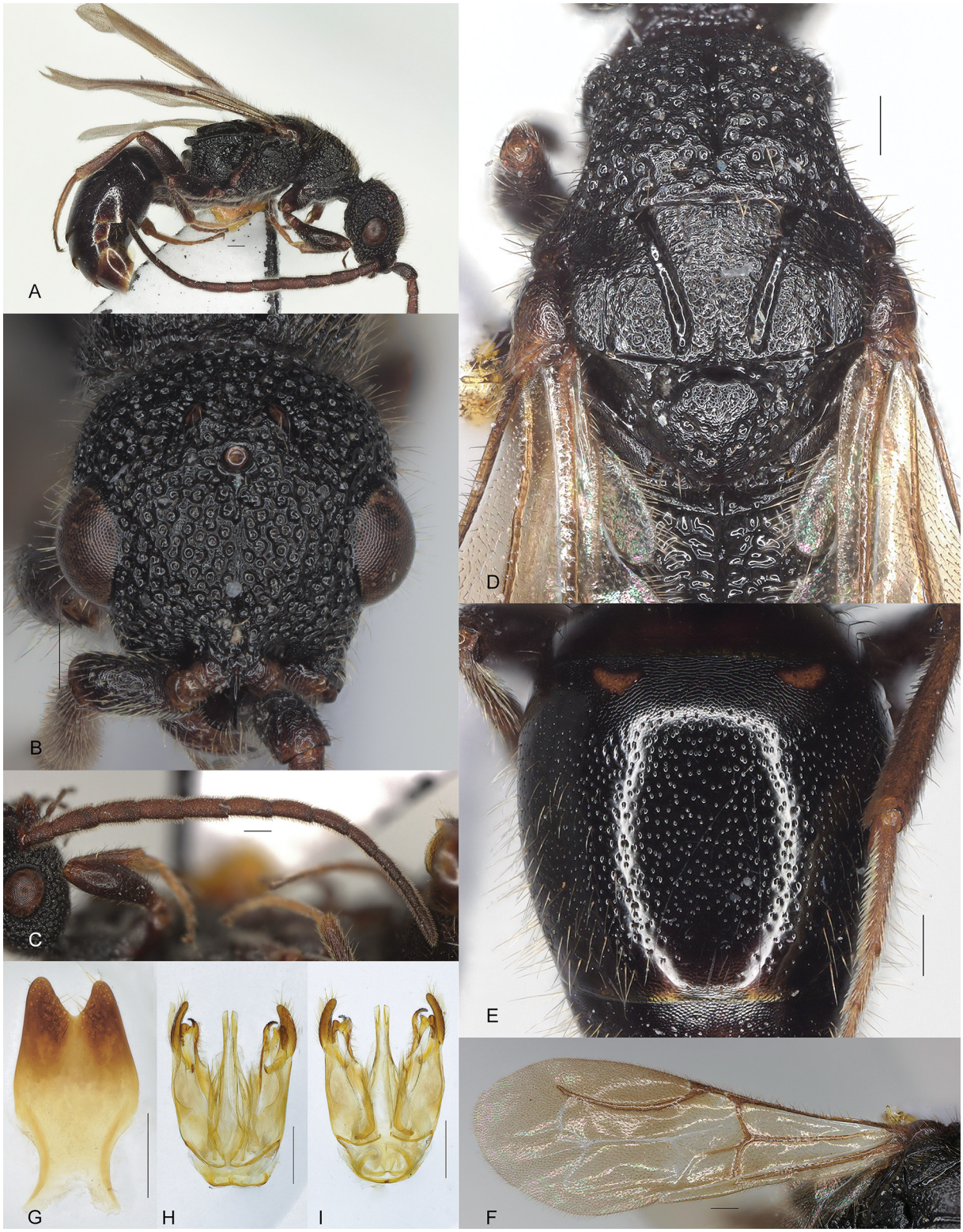


Fig. 2. *Heterocoelia curtisulcus* sp. nov., holotype, ♂ (ZJUH 958281). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum and mesonotum, dorsal view. **E**. T2, dorsal view. **F**. Fore wing. **G**. Hypopygium. **H**. Genitalia, dorsal view. **I**. Genitalia, ventral view. Scale bars: 0.20 mm.

Wings with short, dense brown setae. Legs with dense, short setae. Metasoma with setae longer than setae on head and mesosoma; T1 with setae laterally, T2 with basal glabrous triangular area dorsally.

Head. Longer than wide, LH 1.07× WH. Mandible with four apical teeth, ventralmost one longest. Clypeus trilobite, medio-clypeal lobe with anterior margin rounded (Fig. 2B); medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna thin, flagellomeres cylindrical, length of flagellomere III 1.48× length of flagellomere II. Frons coriaceous and densely foveolate (Fig. 2B); WF 1.74× LE. Contour of eye distinctly protruding in antero-dorsal view (Fig. 2B); LE 1.02× DEV. Anterior ocellus partly anterior to imaginary top line of eyes in antero-dorsal view; POL 1.62× AOL, OOL 1.01× WOT, DPV 1.90× DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes rounded, vertex crest protruding. Gena coriaceous and densely foveolate, ventral surface with shallower and sparser foveae, medioccipito-genal suture present. Occipital carina present, occiput coriaceous.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.54× width along posterior pronotal margin; anterolateral corner rounded; median pronotal sulcus complete, not foveolate (Fig. 2D); lateral pronotal area areolate; cervical pronotal area coarse. Mesoscutum coriaceous with dense punctures, elevated posteriorly; median mesonotal sulcus present on posterior third of mesonotum (Fig. 2D); notauli complete and converging posteriorly (Fig. 2D); parapsidal signum shallow and absent near anterior margin. Mesoscutellum coriaceous and foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 2D); medio-longitudinal sulcus absent. Dorsal surface of MPC elevated; median length of dorsal surface of MPC equal to its half-width; metapostnotum strongly areolate, metapostnotal median carina complete; metapostnotal-propodeal carina complete, distinctly oblique anteriorly and converging posteriorly; dorsal propodeal area striate; paraspiracular and lateral marginal carinae of MPC complete; PPP present, 0.21× median length of dorsal surface of MPC, apical margin of PPP rounded in lateral view; transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; lateral surface of MPC areolate, sublateral carina of MPC not extending to PPP. Propleuron coriaceous and densely foveolate. Mesopleuron coriaceous, densely foveolate; subalar impression present; posterior oblique sulcus of mesopleuron foveolate; postepicnemial sulcus present; ventral surface foveolate, with short carina near mesocoxa, medio-longitudinal sulcus present on apical half.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight, prestigma absent (Fig. 2F); Cu_2v nebulous. Hind wing with three distal hamuli, distance between 1st and 2nd hamuli 1.43× distance between 2nd and 3rd hamuli.

Metasoma. Metasomal terga shiny, with punctures; T1 with tiny sparse punctures, medio-longitudinal sulcus present at basal third of T1; T2 with dense punctures, coriaceous basally (Fig. 2E); basal half of T3–4 coriaceous. Metasomal sterna shiny, with variably sized punctures; S1 with dense punctures. Length of hypopygium 1.79× its width; anterior margin incurved (Fig. 2G); posterior margin incurved, posterior branches broad and short, with long setae, length of branches 0.16× length of hypopygium.

Male genitalia. Harpe bilobate, dorsal harpe S-shaped (Fig. 2H); ventral harpe broader than dorsal harpe, with long setae apically (Fig. 2I). Cuspis bilobate, with long setae; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 2H).

Female

Unknown.

Distribution

China (Shandong) (Fig. 20).

Remarks

The type specimens of this species were identified as *Sulcomesitius borneoensis* Móczár, 1976 by Xu *et al.* (2003) because of the presence of a median mesonotal impression on the mesoscutum near the posterior margin. However, some males of the genus *Heterocoelia* also have a median mesonotal sulcus on the mesoscutum (Azevedo *et al*. 2018; Barbosa *et al*. 2022), and the shape of hypopygium is now used as an important character for the generic identification of the males. After an examination of the male hypopygium, we included these specimens in the genus *Heterocoelia* rather than *Sulcomesitius* because of the longer than wide hypopygium with posterior branches broad and short. In *Heterocoelia* they cannot be associated with a named species; therefore, the species is here described as *H. curtisulcus* sp. nov.

Heterocoelia neomoczari (Barbosa & Azevedo, 2018) comb. nov.
Fig. 3

Sulcomesitius moczari Xu, He & Terayama, 2003: 328–329.
Sulcomesitius neomoczari Barbosa & Azevedo, 2018: 206 (replacement name for *S. moczari* Xu, He & Terayama, 2003 nec Gorbatovsky, 1995).

Material examined

Holotype
CHINA – **Shandong** • ♂; Laoshan; 5 Aug. 1995; Ping Cai leg.; ZJUH 958428.

Re-description

Male
Measurements. Body length 3.61 mm. Fore wing length 2.22 mm.

Colouration. Black. Mandible brown, teeth yellowish brown; maxillary and labial palpi brown. Antenna brown, scape blackish brown. Wings hyaline; fore wing light brown, veins and pterostigma light brown. Legs dark brown, tarsi yellowish brown. Metasomal segments black with posterior margin brown.

Pubescence. Body with short setae, denser on ventral surface. Antenna with short suberect setae, length of setae one-third width of flagellomere (Fig. 3C). Eye with sparse, short setae, nearly 4.0× diameter of an ommatidium. Wings with short, dense brown setae. Legs with dense, short setae. Metasoma with sparse setae; T1 with setae laterally, T2 with basal glabrous triangular area dorsally.

Head. Length equal to width, LH 1.01× WH. Clypeus trilobite, medio-clypeal lobe with anterior margin slightly acute medially (Fig. 3B); medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna thin, flagellomeres cylindrical, length of flagellomere III 1.69× length of flagellomere II. Frons coriaceous and densely foveolate, frontal line shallow and extending to anterior ocellus (Fig. 3B); WF 1.69× LE. Contour of eye protruding in antero-dorsal view (Fig. 3B); LE 1.16× DEV. Anterior ocellus partly anterior to imaginary top line of eyes in antero-dorsal view; POL 1.57× AOL, OOL 1.03× WOT, DPV 1.63× DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes rounded, vertex crest protruding. Gena coriaceous and densely foveolate, ventral surface coriaceous; medioccipito-genal suture present. Occipital carina complete; occiput coriaceous.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.49× width along posterior pronotal margin; anterolateral corner rounded; median pronotal sulcus foveolate (Fig. 3D); lateral pronotal area areolate; cervical pronotal area coarse. Mesoscutum coriaceous with punctures,

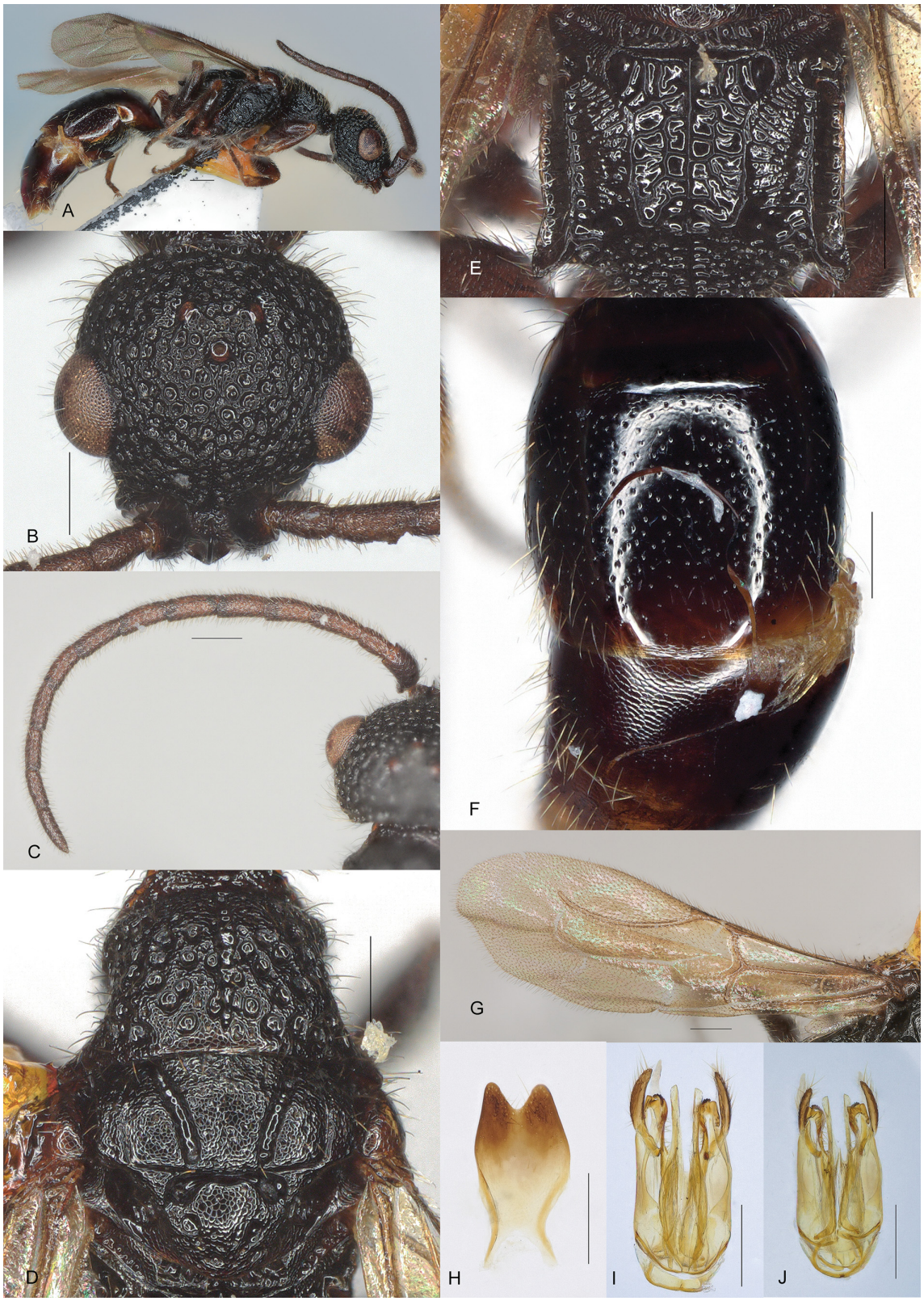


Fig. 3. *Heterocoelia neomoczari* (Barbosa & Azevedo, 2018), holotype, ♂ (ZJUH 958428). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum and mesonotum, dorsal view. **E**. MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: A, C–J = 0.20 mm; B = 0.10 mm.

elevated posteriorly; median mesonotal sulcus absent (Fig. 3D); notauli complete and converging posteriorly (Fig. 3D); parapsidal signum shallow, absent near anterior margin. Mesoscutellum coriaceous and sparsely foveolate (Fig. 3D); mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 3D); medio-longitudinal sulcus absent. Dorsal surface of MPC elevated; median length of dorsal surface of MPC 1.16× its half-width; metapostnotum strongly areolate, metapostnotal median carina complete (Fig. 3E); metapostnotal-propodeal carina complete, distinctly oblique anteriorly and converging posteriorly; dorsal propodeal area striate; paraspiracular and lateral marginal carinae of MPC complete; PPP present, 0.19× median length of dorsal surface of MPC (Fig. 3E); transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; lateral surface of MPC areolate. Propleuron coriaceous, propleural epicoxal sulcus foveolate. Mesopleuron coriaceous and densely foveolate, posterior area transversely striate; subalar impression present; posterior oblique sulcus of mesopleuron foveolate; postepicnemial sulcus present; ventral surface coriaceous, foveolate near mesocoxa; anterior mesofurcal pit present.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight (Fig. 3G); Cu_2v nebulous. Hind wing with three distal hamuli, distance between 1st and 2nd hamuli longer than distance between 2nd and 3rd hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with tiny sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with punctures (Fig. 3F); T3–4 coriaceous basally. Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak. Length of hypopygium 1.84× its width; anterior margin incurved (Fig. 3H); posterior margin bilobate, posterior branches broad and short with long setae, length of posterior branches 0.14× length of hypopygium.

Male genitalia. Harpe bilobate, dorsal harpe S-shaped (Fig. 3I); ventral harpe broader than dorsal harpe, with long setae apically (Fig. 3J). Cuspis bilobate with long setae; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 3I).

Female

Unknown.

Distribution

China (Shandong) (Fig. 20).

Remarks

This species was included in the genus *Sulcomesitius* by Xu *et al*. (2003) because it has the anterior corners of the clypeus obtuse laterally. However, the generic identification of the males is primarily based on the shape of the hypopygium (Argaman 2003; Azevedo *et al.* 2018). We examined the types of this species and transfer it from *Sulcomesitius* to *Heterocoelia* because it has the hypopygium longer than wide with the posterior branches 0.14× the length of the hypopygium, the dorsal harpe narrower than the ventral harpe and the antennal setae short.

Heterocoelia punctulata (Xu, He & Terayama, 2003) comb. nov.
Fig. 4

Sulcomesitius punctulata Xu, He & Terayama, 2003: 323, 326–328.

Material examined

Holotype

CHINA – **Fujian** • ♀; Zhangzhou; Apr. 1987; Naiquan Lin leg.; ZJUH 984787.

Other material (4 ♀♀)

CHINA – **Fujian** • 1 ♀; Fuzhou, Jinshan; Apr. 1987; Naiquan Lin leg.; ZJUH 202300001 • 1 ♀; Shouning; 14 Jul. 1987; Changming Liu leg.; ZJUH 9611394 • 1 ♀; Fuzhou; 13 Aug. 1989; Changming Liu leg.; ZJUH 966313 • 1 ♀; Fuzhou; 14 Aug. 1990; Changming Liu leg.; ZJUH 966320.

Re-description

Female

Measurements (n = 5). Body length 5.42–6.88 mm; fore wing length 2.85–3.20 mm; LH 1.06–1.08 × WH; WF 1.42–1.57 × LE; LE 1.35–1.43 × DEV; POL 1.22–1.34 × AOL; OOL 0.90–1.04 × WOT; median length of pronotum 0.48–0.53 × its width along posterior margin; median length of dorsal surface of MPC 0.71–0.83 × its half-width; length of PPP 0.68–0.72 × median length of dorsal surface of MPC.

Colouration. Black. Mandible brown; maxillary and labial palpi brown, lighter ventrally. Antenna black; scape, pedicel and flagellomeres I–II brown. Legs brown, procoxa partly dark brown. Fore wing hyaline, brown with longitudinal colourless band medially; veins yellowish brown to brown, pterostigma yellowish brown. Posterior margin of T1–2 and S2–3, apical half of T3 and metasomal segments 4–7 yellowish brown.

Pubescence. Body with short, dense light yellowish-brown setae. Antenna with dense appressed setae, sparser on scape (Fig. 4C). Eye with sparse erect setae, 3.0 × diameter of an ommatidium. Wings with short, dense brown setae. Setae of metasoma longer than setae on head and mesosoma; T1 with setae laterally, T2 with basal glabrous triangular area dorsally.

Head. Longer than wide, LH 1.06 × WH. Mandible with four apical teeth, ventralmost one longest. Clypeus trilobite; medio-clypeal lobe with anterior margin slightly acute medially (Fig. 4B); medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna thickened, ratio between length and width of flagellomeres IV–VII are 0.87, 0.71, 0.78 and 0.95 respectively; pedicel shorter than flagellomere I, length of pedicel 0.74 × length of flagellomere I. Frons coriaceous and densely foveolate; WF 1.57 × LE (Fig. 4B). Contour of eye protruding in antero-dorsal view (Fig. 4B); LE 0.36 × LH; LE 1.35 × DEV. Anterior ocellus crossing imaginary top line of eyes in antero-dorsal view; POL 1.23 × AOL, OOL 1.04 × WOT, DPV 2.73 × DAO. Vertex coriaceous and densely foveolate; sides of head behind eyes rounded, vertex crest protruding; occipital carina complete. Gena coriaceous and densely foveolate; medioccipito-genal suture and hypostomal sulcus present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.53 × width along posterior pronotal margin (Fig. 4D); anterolateral corner weakly angled; median pronotal sulcus foveolate; lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum distinctly elevated on apical two-thirds, coriaceous with dense punctures; median mesonotal sulcus absent, only impressed on apical half (Fig. 4E); notauli complete and converging posteriorly; parapsidal signum shallow, absent near anterior margin. Mesoscutellum coriaceous with dense punctures; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 4E); medio-longitudinal sulcus absent. Dorsal surface of MPC elevated; median length of dorsal surface of MPC 0.78 × its half-width; metapostnotum strongly areolate, metapostnotal median carina complete (Fig. 4E); metapostnotal-propodeal carina distinctly oblique anteriorly and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete, lateral marginal carina nearly straight; PPP long, 0.69 × median length of dorsal surface of MPC, not bent upward in dorsal view; transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; anterior metapleural area transversely striate; lateral surface of MPC irregularly striate, areolate near submarginal carina of MPC. Propleuron coriaceous. Mesopleuron coriaceous, densely foveolate; subalar impression present; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus weak.

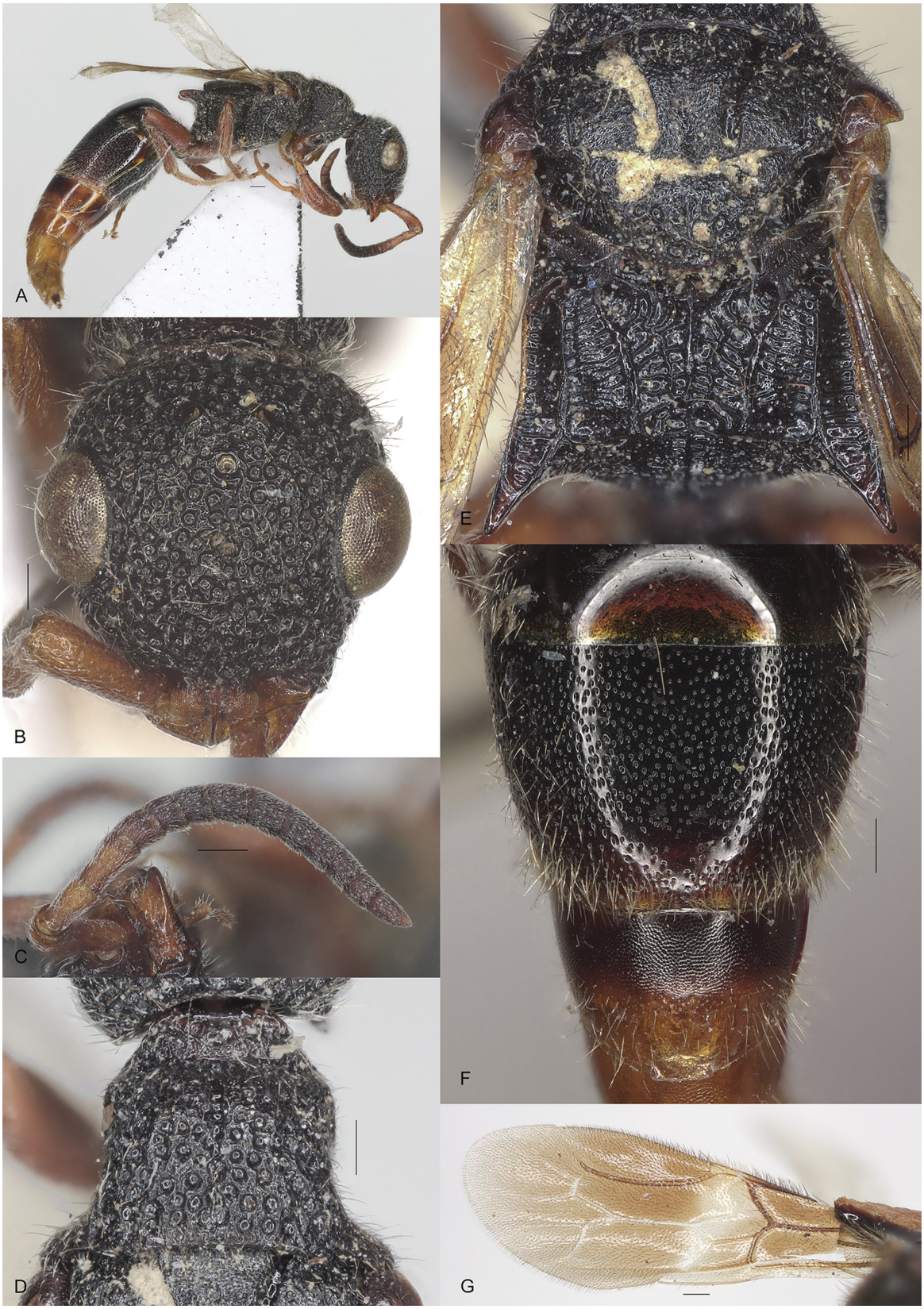


Fig. 4. *Heterocoelia punctulata* (Xu, He & Terayama, 2003), holotype, ♀ (ZJUH 984787). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum and MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. Scale bars: A, C–G = 0.20 mm; B = 0.15 mm.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight, prestigma absent (Fig. 4G); Cu_2v nebulous. Hind wing with three distal hamuli, distance between 1st and 2nd hamuli longer than distance between 2nd and 3rd hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with dense punctures, coriaceous basally (Fig. 4F); T3–4 basal half coriaceous. Metasomal sterna shiny with variably sized punctures; S1 irregularly striate.

Male

Unknown.

Distribution

China (Fujian) (Fig. 20).

Remarks

The examination of the holotype of *S. punctulata* Xu, He & Terayama, 2003 as well as other specimens showed that the mesoscutum is only impressed near the posterior margin rather than having a median mesonotal sulcus, and the antenna is sometimes remarkably thickened medially, which are the main diagnostic features of female *Sulcomesitius*. Females of *Heterocoelia*, however, have at most the mesoscutum shallowly and broadly impressed (Móczár 1984), the antenna slightly thickened and the pronotal median sulcus weak. Therefore, we transfer *S. punctulata* from the genus *Sulcomesitius* to the genus *Heterocoelia*.

Heterocoelia remota sp. nov.

urn:lsid:zoobank.org:act:0D4365A9-6ED5-4203-9104-A5702C7171AF

Fig. 5

Diagnosis

This new species can be recognized by having the antenna thickened, the median pronotal sulcus foveolate, the anterior margin of PPP rounded in lateral view and the hind wing with three dorsal hamuli. This species is similar to *H. varicolor* sp. nov. by having the legs partly dark brown. However, it can be distinguished from it because it has the following characteristics: distance between 1st and 2nd hamuli 2.0 × distance between 2nd and 3rd hamuli (1.5 × in *H. varicolor* sp. nov.); apical margin of PPP rounded in lateral view (truncate in *H. varicolor* sp. nov.).

Etymology

The specific epithet '*remota*'is Latin for 'removed', referring to the distance between the 1st and 2nd distal hamuli being distinctly longer than the distance between the 2nd and 3rd distal hamuli of the hind wing.

Material examined

Holotype

CHINA – **Yunnan** • ♀; Naban River Watershed National Nature Reserve, Naban Tea Factory; [22.15843˚ N, 100.66487˚ E]; alt. 732 m; Flight Interception Trap; 16 May 2009; Lingzeng Meng leg.; IZCAS IOZ(E) 2059129.

Description

Female

Measurements. Body length 6.09 mm. Fore wing length 2.67 mm.

Colouration. Black. Mandible yellowish brown. Antenna dark brown, yellowish brown ventrally; scape, pedicel and flagellomere I reddish brown. Fore wing hyaline, brown with longitudinal light yellowish-brown band near pterostigma; veins yellowish brown to brown, pterostigma yellowish brown. Legs dark brown, trochanters, femora apically, tibiae and tarsi reddish brown. T5 brown, T6–7 yellowish brown.

Pubescence. Body with short, dense light yellowish-brown setae. Antenna with dense appressed setae, sparser on scape. Eye with sparse erect setae, 3.0× diameter of an ommatidium. Wings with short, dense brown setae. Setae of metasoma longer than setae of head and mesosoma; T1 with setae laterally, T2 with basal glabrous triangular area dorsally.

Head. Longer than wide, LH 1.07× WH. Mandible with four apical teeth, ventralmost one longest. Clypeus trilobite, medio-clypeal lobe with anterior margin acute medially (Fig. 5B); medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna slightly thickened. Frons coriaceous and densely foveolate; frontal line weak (Fig. 5B); WF 1.36× LE. Contour of eye protruding in antero-dorsal view; LE 0.39× LH; LE 1.74× DEV. Anterior ocellus crossing imaginary top line of eyes in antero-dorsal view; POL 1.211× AOL, OOL 1.09× WOT, DPV 1.74× DAO. Vertex coriaceous and densely foveolate; sides of head behind eyes converging posteriorly, vertex crest protruding. Occipital carina complete, occiput coriaceous. Gena coriaceous and densely foveolate, shallower foveolate ventrally; medioccipito-genal suture and hypostomal sulcus present.

Mesosoma. Dorsal pronotal area coriaceous, densely foveolate; median length 0.43× width along posterior margin; anterolateral corner rounded; median pronotal sulcus foveolate (Fig. 5C); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum distinctly elevated on apical two-thirds, coriaceous with dense punctures; notauli complete and converging posteriorly; parapsidal signum shallow, absent near anterior margin. Mesoscutellum coriaceous and foveolate with punctures intermediately; mesoscutum-mesoscutellar sulcus present, laterally dilated; medio-longitudinal sulcus absent (Fig. 5D). Dorsal surface of MPC elevated; median length of dorsal surface of MPC 0.81× its half-width; metapostnotum strongly areolate, metapostnotal median carina complete (Fig. 5D); metapostnotal-propodeal carina complete, distinctly oblique anteriorly and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete, lateral marginal carina nearly straight (Fig. 5D); PPP long, 0.48× median length of dorsal surface of MPC, apex rounded in lateral view; transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; anterior metapleural area transversely striate; lateral surface of MPC transversely striate. Propleuron coriaceous, foveolate near procoxa. Mesopleuron coriaceous, densely foveolate; subalar impression present; posterior oblique sulcus of mesopleuron present and foveolate; anterior mesofurcal pit present.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight, prestigma absent (Fig. 5F); Cu_2v nebulous. Hind wing with three distal hamuli, distance between 1st and 2nd distal hamuli 2.0× distance between 2nd and 3rd distal hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with sparse punctures, medio-longitudinal sulcus present on basal one-fourth; T2 with dense punctures, coriaceous basally (Fig. 5E); T3–4 basal half coriaceous. Metasomal sterna shiny, with variably sized punctures.

Male

Unknown.

Distribution

China (Yunnan) (Fig. 20).

Fig. 5. *Heterocoelia remota* sp. nov., holotype, ♀ (IZCAS IOZ(E) 2059129). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Pronotum, dorsal view. **D**. MPC, dorsal view. **E**. T2, dorsal view. **F**. Fore wing. Scale bars: A, C–F = 0.20 mm; B = 0.25 mm.

Heterocoelia unicolor sp. nov.
urn:lsid:zoobank.org:act:8F078314-F9E1-4FAC-8E57-6FA509C0869A
Fig. 6

Diagnosis

This new species can be recognized from other species of this genus by having the foveae on the dorsal pronotal area sparser and shallower than those on the head, the length of the PPP slightly longer than its width at the base, the anterior margin of the PPP rounded in lateral view, the legs reddish brown and the hind wing with three distal hamuli.

Etymology

The specific epithet '*unicolor*' is a combination of the Latin words '*uni-*' and '*color*' which refers to the unicoloured reddish-brown legs of this species.

Material examined

Holotype

CHINA – **Yunnan** • ♀; Naban River Watershed National Nature Reserve, Mandian; 26 Apr. 2009; Lingzeng Meng leg.; IZCAS IOZ(E) 2059143.

Description

Female

Measurements. Body length 6.80 mm. Fore wing length 2.78 mm.

Colouration. Black. Mandible light brown, teeth brown; maxillary and labial palpi brown, lighter ventrally. Antenna black; scape light brown, pedicel and flagellomere I brown. Fore wing hyaline, brown with longitudinal colourless band medially; veins dark brown, pterostigma yellowish brown. Legs light brown. T4–7 brown or light brown.

Pubescence. Body with short, dense light yellowish-brown setae. Antenna with dense appressed setae, sparser on scape. Eye with sparse erect setae, 3.0× diameter of an ommatidium. Wings with short dense brown setae. Setae of metasoma longer than setae of head and mesosoma; T1 with setae laterally, T2 with basal glabrous triangular area dorsally.

Head. Longer than wide, LH 1.08× WH. Mandible with four sharp teeth, ventralmost one longest. Clypeus trilobite; medio-clypeal lobe with anterior margin rounded (Fig. 6B); medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna thickened, ratio between length and width of flagellomeres II–V 0.92, 0.87, 0.92 and 1.04, respectively; pedicel longer than flagellomere I, length of pedicel 1.06× length of flagellomere I. Frons coriaceous and densely foveolate; WF 1.39× LE. Contour of eye protruding in antero-dorsal view (Fig. 6B); LE 0.39× LH; LE 1.46× DEV. Anterior ocellus crossing imaginary top line of eyes in antero-dorsal view; POL 1.32× AOL, OOL 0.84× WOT, DPV 2.73× DAO. Vertex coriaceous and densely foveolate; sides of head behind eyes rounded, vertex crest protruding. Occipital carina complete, occiput coriaceous. Gena coriaceous and densely foveolate, shallower foveolate ventrally; medioccipito-genal suture and hypostomal sulcus present.

Mesosoma. Dorsal pronotal area coriaceous and shallowly foveolate, median length 0.52× width along posterior pronotal margin; anterolateral corner weakly angled (Fig. 6B); median pronotal sulcus foveolate; lateral pronotal area areolate; cervical pronotal area coarse. Mesoscutum distinctly elevated on apical two-thirds, coriaceous with dense punctures; median mesonotal sulcus absent, only impressed in middle of apical half (Fig. 6E); notauli complete and converging posteriorly; parapsidal signum shallow, absent near anterior margin. Mesoscutellum coriaceous and foveolate, with punctures intermediately;

Fig. 6. *Heterocoelia unicolor* sp. nov., holotype, ♀ (IZCAS IOZ(E) 2059143). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum, dorsal view. **F**. MPC, dorsal view. **G**. T2, dorsal view. **H**. Fore wing. Scale bars: A, C–H = 0.20 mm; B = 0.25 mm.

mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 6E); medio-longitudinal sulcus absent. Dorsal surface of MPC elevated; median length of dorsal surface of MPC 0.74 × its half-width; metapostnotum strongly areolate, metapostnotal median carina complete (Fig. 6F); metapostnotal-propodeal carina complete, distinctly oblique anteriorly and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete, lateral marginal carinae nearly straight; PPP long, length of PPP 0.45 × median length of dorsal surface of MPC, apical margin of PPP rounded in lateral view (Fig. 6F); transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; anterior metapleural area transversely striate; lateral surface of MPC irregularly striate, areolate near submarginal carina of MPC. Propleuron coriaceous. Mesopleuron coriaceous, densely foveolate; subalar impression present; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus weak.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight, prestigma absent (Fig. 6H); Cu_2v nebulous. Hind wing with three dorsal hamuli, distance between 1st and 2nd distal hamuli 1.54 × distance between 2nd and 3rd distal hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with sparse punctures, medio-longitudinal sulcus present on basal third of T1; T2 with dense punctures, coriaceous basally (Fig. 6G); basal half of T3–4 coriaceous. Metasomal sterna shiny with variably sized punctures; S1 irregularly striate.

Male

Unknown.

Distribution

China (Yunnan) (Fig. 20).

Heterocoelia varicolor sp. nov.

urn:lsid:zoobank.org:act:F083F8DC-6699-46AE-801B-FAFF42634300

Fig. 7

Diagnosis

This new species can be recognized by having the median pronotal sulcus foveolate, the anterior margin of the PPP truncate in lateral view and the hind wing with three distal hamuli. This species is similar to *H. remota* sp. nov. for having the legs partly dark brown. It can be distinguished from the latter by having the hind wing with the distance between the 1st and 2nd distal hamuli 1.5 × the distance between 2nd and 3rd distal hamuli (2.0 in *H. remota*) and the apex of the PPP is truncate in lateral view (rounded in *H. remota*).

Etymology

The specific epithet is a combination of '*varius*' (Latin for 'different') and '*color*' (Latin for 'tint'), and refers to the variably coloured legs of this species.

Material examined

Holotype

CHINA – **Yunnan** • ♀; Naban River Watershed National Nature Reserve, Mengsong Town, Benggangxinzhai Plantation; [22.18418˚ N, 100.64986˚ E]; alt. 797 m; 12 May 2008; Trap; Lingzeng Meng leg.; IZCAS IOZ(E) 2059142.

Description

Female

Measurements. Body length 6.19 mm. Fore wing length 3.04 mm.

Colouration. Black. Mandible reddish brown. Antenna dark brown, yellowish brown ventrally; scape, pedicel and flagellomere I reddish brown. Fore wing hyaline, brown with longitudinal light yellowish band medially; veins yellowish brown or brown, pterostigma yellowish brown. Legs dark brown, trochanters, femora apically, tibiae and tarsi reddish brown. T4 brown with posterior margin yellowish brown; T5–7 yellowish brown.

Pubescence. Body with short dense light yellowish-brown setae. Antenna with dense appressed setae, sparser on scape (Fig. 7C). Eye with sparse erect setae, 3.0× diameter of an ommatidium. Wings with short dense brown setae. Setae of metasoma longer than setae of head and mesosoma; T1 with setae laterally, T2 with basal glabrous triangular area dorsally.

Head. Longer than wide, LH 1.06× WH. Clypeus trilobite; medio-clypeal lobe with anterior margin slightly acute medially; medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna thickened. Frons coriaceous and densely foveolate (Fig. 7B); WF 1.36× LE. Contour of eye slightly protruding in antero-dorsal view; LE 0.40× LH; LE 1.56× DEV. Anterior ocellus crossing imaginary top line of eyes in antero-dorsal view; POL 0.96× AOL, OOL 0.97× WOT, DPV 2.21× DAO. Vertex coriaceous and densely foveolate; sides of head behind eyes nearly straight, converging posteriorly; vertex crest protruding. Gena coriaceous and densely foveolate. Occipital carina complete.

Mesosoma. Dorsal pronotal area coriaceous, densely foveolate; median length 0.44× width along posterior pronotal margin (Fig. 7D); anterolateral corner rounded; median pronotal sulcus incomplete; lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum distinctly elevated on apical two-thirds, coriaceous with dense punctures (Fig. 7E); median mesonotal sulcus absent, impressed in middle of apical half (Fig. 7E); notauli complete and converging posteriorly; parapsidal signum shallow, absent near anterior margin. Mesoscutellum coriaceous, foveolate with puncture intermediately; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 7E); medio-longitudinal sulcus absent. Dorsal surface of MPC elevated; median length of dorsal surface of MPC 0.89× its half-width; metapostnotum strongly areolate, metapostnotal median carina complete (Fig. 7F); metapostnotal-propodeal carina complete, distinctly oblique anteriorly and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete, lateral marginal carina nearly straight (Fig. 7G); PPP long, 0.47× median length of dorsal surface of MPC, apex truncate in lateral view; transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; anterior metapleural area transversely striate; lateral surface of MPC transversely striate, areolate near submarginal carina of MPC. Mesopleuron coriaceous, densely foveolate; subalar impression present; posterior oblique sulcus of mesopleuron present and foveolate.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight, prestigma absent (Fig. 7H); Cu_2v nebulous. Hind wing with three distal hamuli, distance between 1st and 2nd distal hamuli 1.50× distance between 2nd and 3rd distal hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with sparse punctures, medio-longitudinal sulcus present at basal one-fourth; T2 with dense punctures, coriaceous basally (Fig. 7G); T3–4 basal half coriaceous. Metasomal sterna shiny with variably sized punctures; S1 irregularly striate.

Male

Unknown.

Distribution

China (Yunnan) (Fig. 20).

Fig. 7. *Heterocoelia varicolor* sp. nov., holotype, ♀ (IZCAS IOZ(E) 2059142). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum, dorsal view. **F**. MPC, dorsal view. **G**. T2, dorsal view. **H**. Fore wing. Scale bars: A, C–H = 0.20 mm; B = 0.25 mm.

Genus ***Incertosulcus*** Móczár, 1970

Incertosulcus Móczár, 1970: 185. Type species: *Incertosulcus soikai* Móczár, 1970, by original designation.

Domonkos Argaman, 2003: 79. Type species: *Mesitius capensis* Kieffer, 1911. Synonymized with *Incertosulcus* in Azevedo *et al.* 2018: 194.

Diagnosis

Male antenna with erect setae longer than width of flagellomere. Head and pronotum foveolate. PPP present. Hypopygium with posterior branches broad and short, one-quarter length of hypopygium (Fig. 8G). Male genitalia with dorsal harpe filamentary (Fig. 8H), aedeagus usually with apical sickle process.

Host

Unknown.

Distribution

Afrotropical and Oriental Regions.

Key to the Chinese species of the genus *Incertosulcus* Móczár, 1970

1. Mesoscutum and mesoscutellum coriaceous, not foveolate; mesoscutellum without medio-longitudinal suture; T2 shiny with sparse punctures .....***I. afoveatus*** sp. nov.
– Mesoscutum and mesoscutellum coriaceous and foveolate; mesoscutellum with medio-longitudinal suture (Fig. 9D); T2 with punctures denser than above, basally coriaceous ....***I. exilisulcus*** sp. nov.

Incertosulcus afoveatus sp. nov.
urn:lsid:zoobank.org:act:7E226425-0DEA-43DE-A965-1663A167B2B1
Fig. 8

Diagnosis

This new species can be recognized by having the antennal setae longer than the width of the flagellomeres; median pronotal sulcus present and foveolate; median mesonotal sulcus absent, at most with a long fovea near the posterior margin; PPP short, basal width nearly equal to its length; the hypopygium longer than wide, with the posterior branches short (Fig. 8G); genitalia with dorsal harpe filamentary, and narrower than ventral harpe.

This species is similar to *I. exilisulcus* sp. nov. by sharing the simple aedeagus without a sickle-shaped process apically. However, *I. afoveatus* sp. nov. can be distinguished by having the mesoscutum and mesoscutellum not foveolate (more or less foveolate in *I. exilisulcus*); the mesoscutellum without a medio-longitudinal suture (present in *I. exilisulcus*); the basal width of PPP nearly equal to its length (two-thirds of length in *I. exilisulcus*); T2 with sparse punctures (denser in *I. exilisulcus*).

Etymology

The specific epithet '*afoveatus*' is a combination of the Latin words '*a*' (for 'without') and '*foveatus*' and refers to the absence of foveae on the mesoscutum and mesoscutellum.

Material examined

Holotype

CHINA – **Fujian** • ♂; Minqing, Xiongjiang Town; 13–17 Jul. 2005; Zaifu Xu leg.; ZJUH 200609178.

Paratype (1 ♂)
CHINA – **Hainan** • 1 ♂; Bawangling; 7–11 Jul. 2006; Liqiong Weng leg.; ZJUH 200700151.

Description

Male

Measurements (n = 2). WF 1.78–1.83 × LE; LE 0.99–1.05 × DEV; POL 1.27–1.55 × AOL; OOL 0.87–0.92 × WOT; DPV 1.51–1.56 × DAO; length of hypopygium 1.41–1.53 × its width; length of posterior branches of hypopygium 0.18–0.19 × length of hypopygium.

Colouration. Black, metasoma mainly brown, T3 yellowish brown. Mandible yellowish brown; maxillary and labial palpi brown. Antenna brown, scape dark brown. Legs brown, trochanters, femora apically, tibiae apically, and tarsi yellowish brown. Fore wing hyaline; veins and pterostigma pale yellowish brown.

Pubescence. Body with short sparse setae. Antenna with erect setae, nearly equal to width of flagellomere (Fig. 8B). Eye with sparse short setae, nearly 3.0 × diameter of an ommatidium. Wings with short, dense brown setae. T1 nearly glabrous; T2 with sparse setae laterally.

Head. Slightly shorter than wide, LH 0.98 × WH. Mandible with three apical teeth, ventralmost one largest. Clypeus trilobite; medio-clypeal lobe with apical margin acute medially; medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna thin, flagellomeres cylindrical. Frons coriaceous and densely foveolate, frontal line weak (Fig. 8A); WF 1.83 × LE. Eye small, LE 0.35 × LH; contour of eye distinctly protruding in antero-dorsal view (Fig. 8A); LE 0.99 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes in antero-dorsal view; POL 1.27 × AOL, OOL 0.87 × WOT, DPV 1.51 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes distinctly converging posteriorly (Fig. 8A). Occipital carina present, vertex crest nearly straight.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.33 × width of posterior pronotal margin, anterolateral corner rounded; median pronotal sulcus foveolate; lateral pronotal area obliquely striate; cervical pronotal area coarse (Fig. 8C). Mesoscutum coriaceous and sparsely foveolate; median mesonotal sulcus absent; notauli complete and converging posteriorly (Fig. 8C); parapsidal signum shallow and absent near anterior margin; lateral area of mesoscutum depressed anteriorly (Fig. 8C). Mesoscutellum weakly coriaceous with shallow punctures; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 8C). Dorsal surface of MPC elevated; median length of dorsal surface of MPC equal to its half-width (Fig. 8D); metapostnotum strongly areolate, metapostnotal median carina complete, slightly tortuous (Fig. 8D); metapostnotal-propodeal carina complete, slightly oblique anteriorly and converging posteriorly; dorsal propodeal area densely striate; paraspiracular carinae of MPC complete; lateral marginal carina of MPC complete and protruding (Fig. 8D); PPP short, 0.1 × median length of dorsal surface of MPC, apex acute and bent upward in lateral view; transverse posterior carina of MPC complete; propodeal declivity coriaceous, areolate near transverse posterior carina, median and lateral carinae complete; lateral surface of MPC sparsely striate, areolate near submarginal carina of the MPC. Propleuron coriaceous. Mesopleuron coriaceous, densely and shallowly foveolate; subalar impression present; posterior oblique sulcus of mesopleuron present and foveolate.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically (Fig. 8F); posterior margin of pterostigma nearly straight, prestigma absent; Cu_2v absent. Hind wing with three distal hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with sparse punctures, medio-longitudinal sulcus present on anterior third of T1; T2 with sparse punctures, weakly coriaceous basally (Fig. 8E).

Metasomal sterna shiny with variably sized punctures; S1 coriaceous. Length of hypopygium 1.4× its width; anterior stalk with anterior margin straight (Fig. 8G); posterior margin bilobate (Fig. 8G), posterior branches broad and short with long setae, 0.2× length of hypopygium.

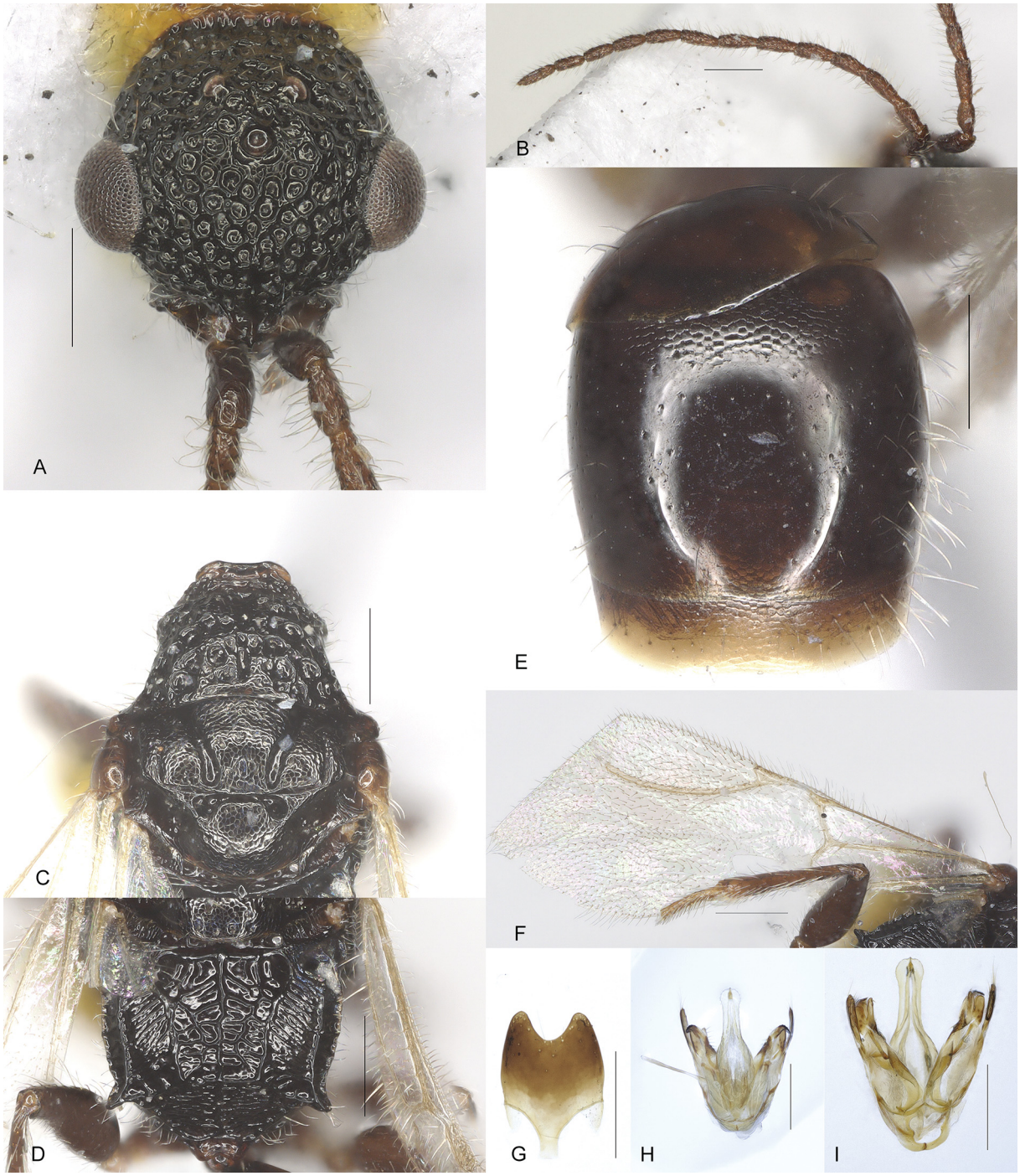


Fig. 8. *Incertosulcus afoveatus* sp. nov., holotype, ♂ (ZJUH 200609178). **A**. Head, antero-dorsal view. **B**. Antenna. **C**. Pronotum and mesonotum, dorsal view. **D**. MPC, dorsal view. **E**. T2, dorsal view. **F**. Fore wing. **G**. Hypopygium. **H**. Genitalia, dorsal view. **I**. Genitalia, ventral view. Scale bars: 0.20 mm.

Male genitalia. Harpe bilobate, dorsal harpe filamentary and straight (Fig. 8H); ventral harpe distinctly broader than dorsal harpe and with long setae apically (Fig. 8I). Cuspis bilobate with long setae; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped with apical margin rounded (Fig. 8H).

Female

Unknown.

Distribution

China (Fujian, Hainan) (Fig. 20).

Incertosulcus exilisulcus sp. nov.
urn:lsid:zoobank.org:act:233C0A49-2466-44BA-A7B9-433819F1EF0D
Fig. 9

Diagnosis

This new species can be recognized by having the antennal setae longer than the width of the flagellomere; median pronotal sulcus present and not distinctly foveolate; median mesonotal sulcus absent, at most with a fovea or foveolate sulcus near posterior margin; the length of PPP longer than its width at the base; the hypopygium longer than wide, with posterior branches short; the genitalia with the dorsal harpe filamentary and narrower than the ventral harpe.

This species is similar to *I. afoveatus* sp. nov. by sharing the simple aedeagus (without a sickle-shaped process apically). However, it can be distinguished as follows: the mesoscutellum has a medio-longitudinal suture, the PPP is longer than its width at the base and T2 has denser punctures than in *I. afoveatus*.

Etymology

The specific epithet '*exilisulcus*' is a combination of the Latin words '*exilis*' ('weak') and '*sulcus*' ('groove') and refers to the mesoscutellum of this species having a weak medio-longitudinal suture.

Material examined

Holotype

CHINA – **Hainan** • ♂; Bawangling; 7–11 Jul. 2006; Liqiong Weng leg.; ZJUH 200700110.

Paratypes (9 ♂♂)

CHINA – **Hainan**: 1 ♂; same collection data as holotype; ZJUH 200700135 • 6 ♂♂; Bawangling; 7–11 Jul. 2006; Jingxian Liu leg.; ZJUH 200700012, 200700028, 200700040, 200700041, 200700075, 200700084 • 1 ♂; Jianfengling; 12–15 Jul. 2006; Tianfei Chen leg.; ZJUH 200700786. – **Yunnan** • 1 ♂; Mt. Gaoligong; 20–21 Jul. 2006; Jie Zeng leg.; ZJUH 200701080.

Description

Male

Measurements (n = 10). Body length 2.85–4.01 mm; fore wing length 1.81–2.49 mm; LH 0.95–1.03 × WH; WF 1.75–1.91 × LE; LE 0.95–1.11 × DEV; POL 1.44–1.68 × AOL; OOL 0.86–0.99 × WOT; DPV 1.65–2.3 × DAO; median length of pronotum 0.42–0.48 × its width along posterior margin; length of MPC 0.93–1.12 × its half-width; length of PPP 0.19–0.27 × median length of dorsal surface of MPC; length of hypopygium 1.28–1.51 × its width; length of hypopygial posterior branches 0.21–0.26 × length of hypopygium.

Colouration. Black. Mandible brown, teeth yellowish brown; maxillary and labial palpi brown. Antenna yellowish brown, scape brown. Legs brown, trochanters, tibiae apically, and tarsi yellowish brown. Prothorax and mesothorax dark brown. Fore wing hyaline, light brown with longitudinal colourless band medially; veins and pterostigma pale light brown. Metasoma mainly brown, partly dark brown.

Pubescence. Body with short setae. Antenna with erect setae, nearly equal to width of flagellomere (Fig. 9C). Eye with short setae, nearly 4.0 × diameter of an ommatidium. Wings with short dense brown setae. T1 nearly glabrous, T2 with sparse setae laterally.

Head. Slightly shorter than wide, LH 0.95 × WH. Mandible with three apical teeth, ventral larger than upper two. Clypeus trilobite; medio-clypeal lobe with anterior margin acute medially; medio-clypeal carina present, not extending into frons, arched in lateral view. Antenna thin, flagellomeres cylindrical. Frons coriaceous and densely foveolate, frontal line weak (Fig. 9B); WF 1.79 × LE. Eye small, LE 0.35 × LH; contour of eye distinctly protruding in antero-dorsal view; LE 1.06 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes in antero-dorsal view (Fig. 9B); POL 1.60 × AOL, OOL 0.98 × WOT, DPV 2.23 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes distinctly converging posteriorly, vertex crest nearly straight. Gena coriaceous and densely foveolate, ventral surface with fovea shallower and sparser, medioccipito-genal suture present. Occipital carina present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.33 × width along posterior pronotal margin; anterolateral corner rounded; median pronotal sulcus nearly complete (Fig. 9D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous and shallowly foveolate; median mesonotal sulcus absent; notauli complete and converging posteriorly; parapsidal signum shallow and absent near anterior margin; lateral area of mesoscutum depressed anteriorly (Fig. 9D). Mesoscutellum coriaceous, distinctly foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated; medio-longitudinal suture present (Fig. 9D). Dorsal surface of MPC elevated; median length of dorsal surface of MPC equal to its half-width; metapostnotum strongly areolate, metapostnotal median carina complete; metapostnotal-propodeal carina complete, distinctly oblique anteriorly and converging posteriorly; dorsal propodeal area striate; paraspiracular and lateral marginal carinae of MPC complete, lateral marginal carina nearly straight; PPP present, 0.27 × median length of dorsal surface of MPC, apex acute and not bent upward in lateral view (Fig. 9E); transverse posterior carina of MPC complete; propodeal declivity weakly striate, areolate near transverse posterior carina, median and lateral carinae complete; lateral surface of MPC irregularly striate, areolate near submarginal carina of MPC. Propleuron coriaceous. Mesopleuron coriaceous, densely foveolate; subalar impression present; posterior oblique sulcus of mesopleuron present and foveolate; ventral surface without fovea, with short carina near mesocoxa; anterior mesofurcal pit and mesodiscrimen present.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight, prestigma absent; Cu_2v absent. Hind wing with three distal hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with punctures, coriaceous basally (Fig. 9F). Metasomal sterna shiny with variably sized punctures; S1 irregularly striate. Length of hypopygium 1.28 × width; anterior stalk narrowed with anterior margin straight (Fig. 9H); posterior margin bilobate, posterior branches broad and short with long setae, 0.23 × length of hypopygium.

Male genitalia. Harpe bilobate, dorsal harpe filamentary and straight (Fig. 9I); ventral harpe distinctly broader than dorsal harpe (Fig. 9J), with long setae apically. Cuspis bilobate with long setae; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped, apical margin acute medially (Fig. 9I).

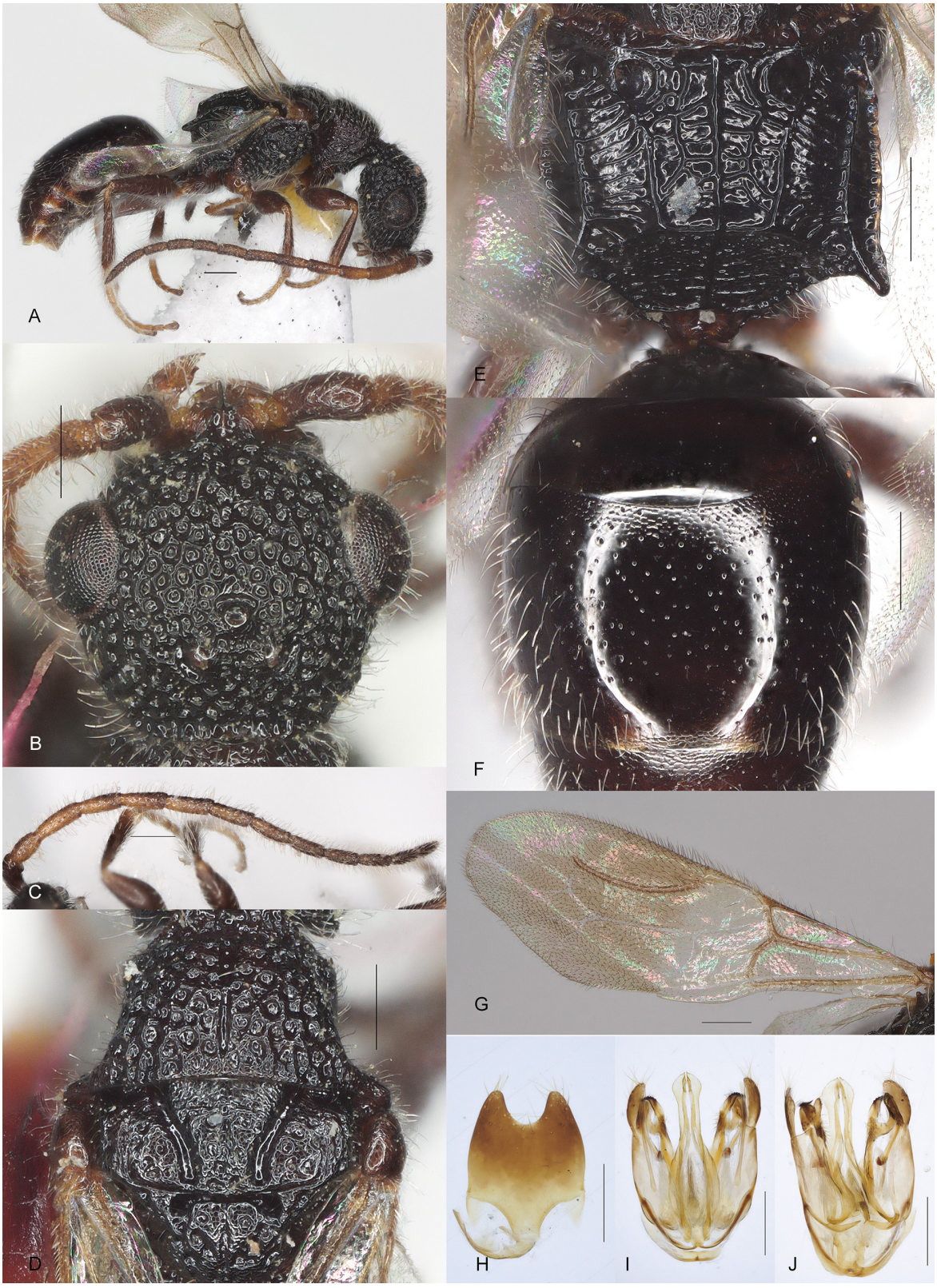


Fig. 9. *Incertosulcus exilisulcus* sp. nov., holotype, ♂ (ZJUH 200700110). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum and mesonotum, dorsal view. **E**. MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: 0.20 mm.

Female

Unknown.

Distribution

China (Hainan, Yunnan) (Fig. 20).

Genus ***Metrionotus*** Móczár, 1970

Metrionotus Móczár, 1970: 177, 201–202. Type species: *Metrionotus pappi* Móczár, 1970: 202.

Diagnosis

Malar space convergent anteriorly. Male antenna with flagellomeres short. Mesoscutum without median mesonotal sulcus. PPP weak. Male hypopygium wider than long, anterior median stalk of hypopygium acute apically, posterior branches short. Male genitalia with dorsal harpe club-shaped and as wide as ventral harpe.

Host

Unknown.

Distribution

Afrotropical, Oriental, and Palaearctic Regions.

Metrionotus hongkongensis Móczár, 1974

Metrionotus hongkongensis Móczár, 1974: 175–176.

Material examined

None in this study.

Distribution

China (Hong Kong) (Fig. 20).

Genus ***Sulcomesitius*** Móczár, 1970

Sulcomesitius Móczár, 1970: 177, 199. Type species: *Sulcomesitius longispinus* Móczár, 1970: 200–201.
Topcobius Nagy, 1972: 17. Type species: *Mesitius punctaticollis* Fouts, 1930: 2. Synonymized with *Sulcomesitius* in Móczár 1984: 119.

Diagnosis

Body foveolate. Anterior ocellus usually entirely anterior to imaginary top line of eyes in antero-dorsal view. Dorsal pronotal area with median pronotal sulcus; dorsal pronotal area usually with anterolateral corner weakly projected. Mesoscutum with median mesonotal sulcus usually developed. PPP usually robust. Male hypopygium longer than wide, basal part of hypopygium with lateral and anterior margin incurved; posterior branches lobose and long. Male genitalia with dorsal harpe usually S-shaped, ventral harpe narrower than dorsal one.

Host

Unknown.

Distribution

Afrotropical, Oriental, and Palaearctic Regions.

Key to the Chinese species of the genus *Sulcomesitius* Móczár, 1970

1. Female: antenna usually thickened 2
– Male: antenna usually slender 4

2. PPP as long as median length of dorsal surface of MPC ..... ***S. haemorrhoidalis*** (Maretti, 1897)
– PPP shorter, at most two-thirds as long as median length of dorsal surface of MPC 3

3. Legs reddish brown; length of eye shorter than width of frons, WF:LE = 1.33 .... ***S. impressus*** Xu, He & Terayama, 2003
– Legs partly dark brown; length of eye equal to width of frons, WF:LE = 1.01 ....***S. angustifrons*** sp. nov.

4. Hypopygium with posterior branches wider than median notch ..... ***S. latibilobatus*** sp. nov.
– Hypopygium with posterior branches narrower than median notch 5

5. Hind wing with four distal hamuli; basal part of hypopygium with lateral margin distinctly incurved, posterior branches with long setae on inner margin; dorsal harpe 8-shaped .....***S. breviculus*** (Xu, He & Terayama, 2003) comb. nov.
– Hind wing with three distal hamuli; basal part of hypopygium with lateral margin slightly incurved, posterior branches with long setae apically; dorsal harpe S-shaped 6

6. T2 with dense punctures, granulate basally; mesoscutum distinctly elevated; mesoscutellum densely foveolate; apical margin of PPP blunt in dorsal view ..... ***S. zhaoi*** (Xu & He, 2006) comb. nov.
– T2 with punctures separated by more than 2.0× their diameter; mesoscutum slightly elevated; mesoscutellum foveolate; apical margin of PPP acute in dorsal view .....***S. sparsulus*** sp. nov.

Sulcomesitius angustifrons sp. nov.
urn:lsid:zoobank.org:act:1E90D2B8-2938-4D0B-BEAA-5CE53006645D
Fig. 10

Diagnosis

This new species can be recognized by having the median pronotal sulcus developed, the PPP distinctly longer than its width at the base, the apical margin of the PPP distinctly acute in dorsal view and the hind wing with four distal hamuli. This species is similar to *S. impressus* Xu, He & Terayama, 2003. However, the new species can be distinguished by having the following characteristics: length of eye equal to width of frons (WF 1.33× LE in *S. impressus*), legs partly dark brown (reddish brown in *S. impressus*), and T4–5 dark brown (brown or reddish brown in *S. impressus*), punctures on lateral surface of T2 as dense as on dorsal surface (denser on lateral surface than on dorsal surface in *S. impressus*).

Etymology

The specific epithet is a combination of '*angustus*' (Latin for 'narrow') and '*frons*', referring to the comparatively narrow frons.

Material examined

Holotype

CHINA – **Yunnan** • ♀; Xishuangbanna, Naban River Watershed National Nature Reserve; [22.12961˚ N, 100.66612˚ E]; alt. 746 m; 6 Jun. 2008; A. Weigel leg.; IZCAS IOZ(E) 2059138.

Description

Female

Measurements (holotype, Fig. 10A). Body length 7.06 mm. Fore wing length 3.16 mm.

Colouration. Body black. Mandible brown; maxillary palp and labial palp brown. Antenna black, yellowish brown ventrally; scape, pedicel, and flagellomeres I–II brown. Fore wing bi-banded, veins brown or yellowish brown, pterostigma yellowish brown. Legs dark brown; trochanters, tibiae and tarsi yellowish brown. T1–3 with posterior margin yellowish brown, metasomal segments 3–5 dark brown with posterior margin yellowish brown, metasomal segments 6–7 yellowish brown.

Pubescence. Body with short setae; maxillary palp, labial palp and antenna with dense appressed setae (Fig. 10C). Metasomal segments with setae longer than setae of head and mesosoma; T1 with sparse setae posterolaterally; T2 densely setose posteriorly and laterally with basal triangular area glabrous. Wings with dense, short yellowish-brown setae.

Head. Longer than wide, LH 1.07× WH. Mandible with 4 apical teeth, ventralmost one sharp and largest. Clypeus trilobite; medio-clypeal lobe with anterior margin acute medially (Fig. 10B); medio-clypeal carina not extending into frons, arched in lateral view. Antenna distinctly thickened, at least flagellomeres II–IX shorter than wide. Frons coriaceous and densely foveolate (Fig. 10B); WF 1.01× LE. Contour of eye protruding in antero-dorsal view, LE 0.46× LH, LE 2.08× DEV. Anterior ocellus entirely anterior to imaginary top line of eyes; POL 1.33× AOL, OOL 0.93× WOT, DPV 2.36× DAO. Sides of head behind eyes rounded and slightly converging posteriorly. Vertex coriaceous and densely foveolate, vertex crest slightly protruding. Malar space 1.21× distance between posterior ocelli and vertex crest. Gena coriaceous, densely foveolate, with shallow foveolae ventrally. Occipital carina complete, occiput coriaceous with shallow punctures. Medioccipito-genal suture present. Hypostomal sulcus present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.51× width of posterior pronotal margin (Fig. 10D); median pronotal sulcus present; lateral pronotal area obliquely strigate; cervical pronotal area coarse. Mesoscutum with notauli complete, parapsidal signum shallow but complete; lateral area of mesoscutum coriaceous with shallow punctures and depressed anteriorly. Mesoscutellum coriaceous with punctures, densely foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated. Median length of dorsal surface of MPC 1.04× its half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete and parallel (Fig. 10E); length of PPP 0.32× median length of dorsal surface of MPC (Fig. 10E); propodeal declivity areolate, median and lateral carinae complete; lateral surface of MPC areolate, anterior metapleural area transversely striate. Propleuron coriaceous and shallowly foveolate. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 0.80× Sc+R_2v; posterior margin of pterostigma straight, prestigma absent (Fig. 10G); Cu_2v present as yellowish-brown trace. Hind wing with four distal hamuli.

Fig. 10. *Sulcomesitius angustifrons* sp. nov., holotype, ♀ (IZCAS IOZ(E) 2059138). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. Scale bars: A, C–G = 0.20 mm; B = 0.25 mm.

Metasoma. Metasomal terga shiny with punctures; T1 with tiny, sparse punctures; T2 with dense punctures separated by 1–5× their diameter, posterior margin without punctures (Fig. 10F); T3–5 with three semi-circular impressions on posterior margin. Metasomal sterna shiny with punctures; S1 irregularly striate, metapostnotal median carina weak; S2–3 with dense punctures separated by less than 2.0× their diameter.

Male

Unknown.

Distribution

China (Yunnan) (Fig. 20).

Sulcomesitius breviculus (Xu, He & Terayama, 2003) comb. nov.
Fig. 11

Heterocoelia brevicula Xu, He & Terayama, 2003: 320–322.

Diagnosis

Sulcomesitius breviculus (Xu, He & Terayama, 2003) can be distinguished from other species of the genus *Sulcomesitius* by having the anterolateral corner of the pronotum rounded, the length of PPP at most equal to its basal width, the hypopygium distinctly narrower anteriorly, and the dorsal harpe of the genitalia 8-shaped (Fig. 11I).

Material examined

Holotype

CHINA – **Zhejiang** • ♂; Kaihua County, Gutian Mountain; 22 Jul. 1992; Hong Wu leg.; ZJUH 949066.

Paratypes (2 ♂♂)

CHINA – **Zhejiang** • 1 ♂; same collection data as for holotype; ZJUH 949082 • 1 ♂; same collection data as for preceding but 17 Jul. 1992; Yun Ma leg.; ZJUH 923783.

Other material (18 ♂♂)

CHINA – **Zhejiang** • 1 ♂; same collection data as for holotype but 18 Jul. 1992; Yun Ma leg.; ZJUH 923914 • 3 ♂♂; same collection data as for preceding but Xuexin Chen leg.; ZJUH 923359, 923443, 923551 • 1 ♂; same collection data as for preceding but 19 Aug. 2003; Wuqing Fan leg.; ZJUH 20047497 • 2 ♂♂; same collection data as for preceding but 2 Jul. 2005; Min Shi leg.; ZJUH 200601769, 200601849 • 7 ♂♂; same collection data as for preceding but 3 Jul. 2005; Qiong Wu leg.; ZJUH 200602041, 200602046, 200602047, 200602048, 200602053, 200602065, 200602103 • 1 ♂; Longquan City, Fengyang Mountain; 7 Aug. 2003; Xiaoxia Yu leg.; ZJUH 20034610 • 1 ♂; Linan County, Qingliang Mountain; 10 Aug. 2005; Hongying Zhang leg.; ZJUH 200603355 • 1 ♂; Linan County, Qianmutian Glacier; 25 Jul. 2011; Shengnan Song leg.; ZJUH 201503630. – **Yunnan** • 1 ♂; Tengchong City, Gaoligong Mountain; 20–21 Jul. 2006; Jie Zeng leg.; ZJUH 200701076.

Re-description

Male

Measurements (n = 21). Body length 3.71–5.32 mm; length of fore wing 2.19–3.27 mm; LH 0.96–1.03× WH; WF 1.21–1.41× LE; LE 0.42–0.47× LH; LE 1.44–1.82× DEV; POL 1.54–2.0× AOL; OOL 0.76–0.93× WOT; DPV 0.99–1.66× DAO; malar space 0.86–1.73× distance between posterior ocelli and vertex crest; median length of pronotum 0.38–0.44× width of pronotum along posterior margin;

median length of dorsal surface of MPC 0.9–1.0 × its half-width; length of PPP 0.12–0.22 × median length of dorsal surface of MPC; length of 2r-rs&Rs_2v 0.85–1.08 × length of Sc+R_2v; length of posterior branches of hypopygium 0.42–0.53 × length of hypopygium.

Colouration. Body dark bronw to black. Antenna yellowish brown, darker apically. Fore wing light brown, slightly darker on apical half; veins brown or yellowish brown, pterostigma yellowish brown. Legs yellowish brown, coxae and femora brown. Metasoma brown to dark brown, anterior margin of T2 with pair of yellowish-brown semicircular spots.

Pubescence. Body with short setae. Maxillary and labial palpi with dense, short setae. Antenna with short suberect setae, length of setae 0.25 × width of flagellomere II (Fig. 11C). Eye with sparse short setae, nearly 5.0 × diameter of an ommatidium. Wings with short dense brown setae. Metasomal segments with setae longer than setae of head and mesosoma, T1 with sparse setae posterolaterally, T2 with basal triangular area glabrous.

Head. Slightly longer than wide, LH 1.04 × WH. Clypeus trilobite; medio-clypeal lobe with anterior margin acute medially; medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender, length of flagellomere II 1.88 × its width, 0.75 × length of flagellomere I. Frons coriaceous and densely foveolate (Fig. 11B); WF 1.34 × LE. Contour of eye protruding in antero-dorsal view; LE 0.43 × LH, LE 1.58 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes; POL 1.57 × AOL, OOL 0.93 × WOT, DPV 1.27 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes rounded and slightly converging posteriorly, vertex crest protruding. Malar space 0.89 × distance between posterior ocelli and vertex crest. Gena coriaceous, densely foveolate, with shallow foveolae ventrally. Occipital carina complete, occiput coriaceous with shallow punctures. Medioccipito-genal suture present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length of dorsal pronotal area 0.42 × width along posterior pronotal margin; anterolateral corner rounded; median pronotal sulcus present (Fig. 11D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous with shallow punctures; median mesonotal sulcus absent, with a fovea near posterior margin; basal half with medio-line carinate (Fig. 11D); notauli complete and converging posteriorly, parapsidal signum shallow and absent near anterior margin. Mesoscutellum slightly elevated, coriaceous, densely foveolate with punctures; mesoscutum-mesoscutellar sulcus present, laterally slightly dilated (Fig. 11E). Median length of dorsal surface of MPC 0.93 × its half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly (Fig. 11E); dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete; length of PPP 0.15 × median length of dorsal surface of MPC; transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; anterior metapleural area shiny, weakly striate; lateral surface of MPC with submarginal carina and posterior carina, areolate. Propleuron coriaceous, propleural epicoxal sulcus present. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous and irregularly foveolate, area between mesocoxa with three large foveae; anterior mesofurcal pit present and deep.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 1.12 × Sc+R_2v; posterior margin of pterostigma protruding, prestigma absent (Fig. 11G); Cu_2v present as yellowish-brown trace. Hind wing with four distal hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with tiny sparse punctures, medio-longitudinal sulcus present on basal one-third; T2 with sparse punctures separated by more than their own diameter;

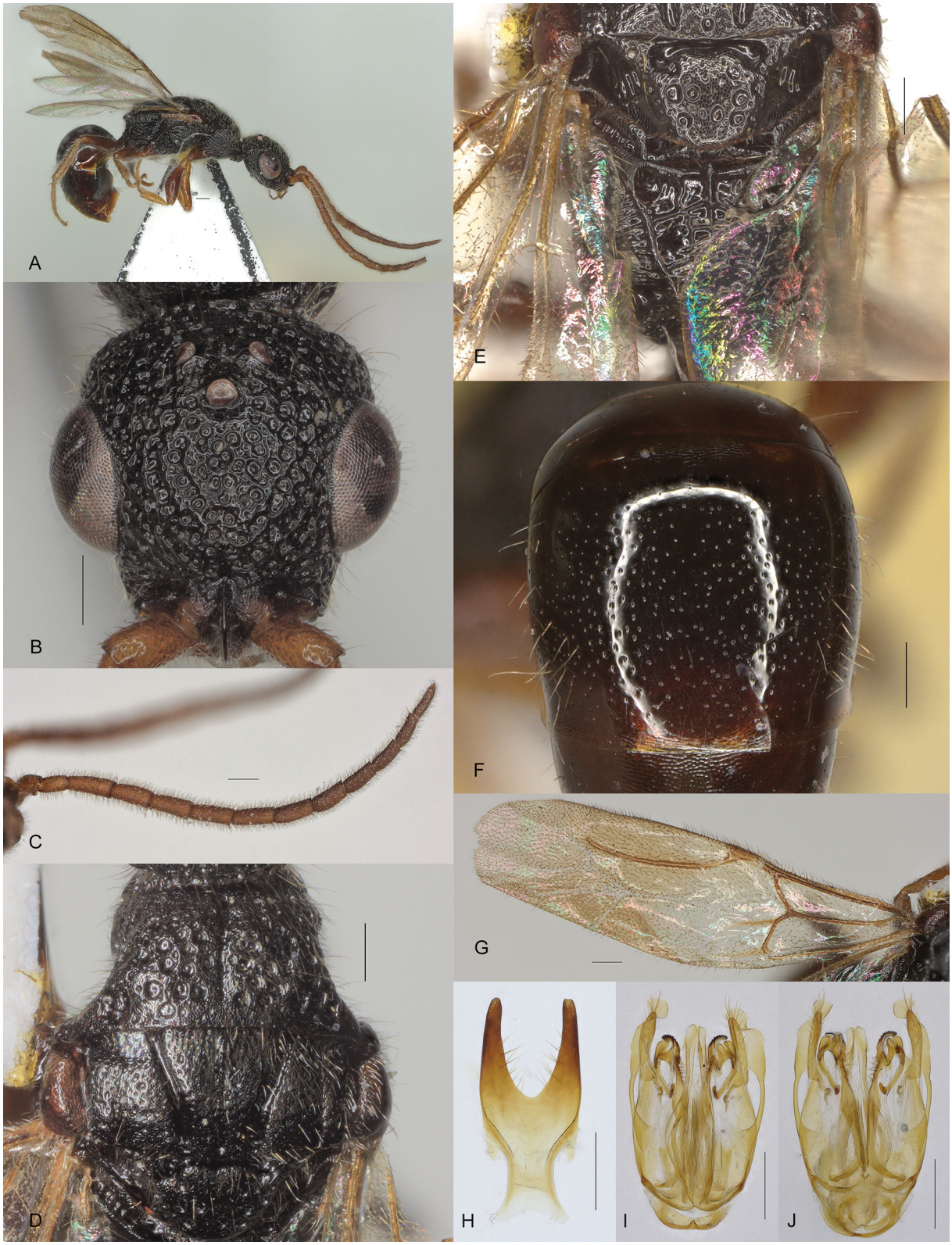


Fig. 11. *Sulcomesitius breviculus* (Xu, He & Terayama, 2003), holotype, ♂ (ZJUH 949066). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum and mesonotum, dorsal view. **E**. MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: 0.20 mm.

basal half of T3–4 weakly coriaceous with punctures posteriorly. Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak; S2 with dense, variably sized punctures. Hypopygium longer than wide; basal part of hypopygium with lateral margin distinctly incurved (Fig. 11H); posterior branches distinctly narrower than median notch, inner margin with long setae, length of posterior branches 0.45 × length of hypopygium.

Male genitalia. Harpe bilobate, basal half of dorsal harpe filamentary, apical half 8-shaped (Fig. 11I), longer than ventral harpe. Inner margin of gonostipe with series of sharp parallel carinae (Fig. 11J). Cuspis with apical margin incurved; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 11I).

Female

Unknown.

Distribution

China (Zhejiang, Yunnan) (Fig. 20).

Remarks

This species was included by Xu *et al*. (2003) in the genus *Heterocoelia* because it has the anterior corners of the clypeus rectangular laterally, the mesoscutum without a median mesonotal sulcus and the apex of the PPP rounded in lateral view. However, the generic identification of the males is mainly based on the shape of the hypopygium (Argaman 2003; Azevedo *et al.* 2018). After studying the males, we transfer *H. breviculus* from the genus *Heterocoelia* to the genus *Sulcomesitius* because the hypopygium of this species is longer than wide, with the posterior branches lobose and 0.45 × the length of the hypopygium (posterior branches short and broad in *Heterocoelia*); the head and pronotum densely foveolate; the pronotum with a median pronotal sulcus and PPP present (although comparatively short compared to other species of *Sulcomesitius*).

Sulcomesitius haemorrhoidalis (Magretti, 1897)

Mesitius carcell var. *haemorrhoidalis* Magretti, 1897: 321.

Sulcomesitius haemorrhoidalis – Móczár 1977: 425.

Material examined

None in this study.

Distribution

China (Hong Kong, Taiwan) (Fig. 20), Burma and Mediterranean Subregion.

Sulcomesitius impressus Xu, He & Terayama, 2003
Fig. 12

Sulcomesitius impressus Xu, He & Terayama, 2003: 324–325.

Material examined

Holotype

CHINA – **Guangxi** • ♀; Longsheng County, Huaping Nature Reserve; [25.39˚ N, 109.55˚ E]; 23 Jun. 1982; Junhua He leg.; ZJUH 823323.

Other material (1 ♀)

CHINA – **Guizhou** • 1 ♀; Leigong Mountain, Xiaodanjiang; 4–5 Jun. 2005; Jingxian Liu leg.; ZJUH 20059386.

Re-description

Female

Measurements (n = 2). Body length 6.35–6.38 mm; length of fore wing 3.02–3.57 mm; LH 1.03–1.04 × WH; WF 1.32–1.33 × LE; LE 1.63–1.77 × DEV; POL 1.32–1.34 × AOL; OOL 0.79–0.81 × WOT; DPV 2.02–2.11 × DAO; malar space 1.07–1.47 × distance between posterior ocelli and vertex crest; median length of dorsal surface of MPC 0.90–0.92 × its half-width; length of PPP 0.45–0.46 × median length of dorsal surface of MPC.

Colouration. Body black. Mandible brown, maxillary palpi and labial palpi brown. Antenna black, yellowish brown ventrally, scape, pedicel and flagellomeres I–II brown. Fore wing bi-banded, veins brown, pterostigma yellowish brown. Legs brown. T2 posteriorly and T3–4 yellowish brown.

Pubescence. Body with short setae; maxillary palp, labial palp and antenna with dense appressed setae (Fig. 12C). Eye with sparse erect setae, 5.0 × diameter of an ommatidium. Setae of metasoma longer than setae of head and mesosoma; T1 with sparse setae posterolaterally; T2 with dense setae, basal triangular area glabrous. Wings with dense short yellowish-brown setae.

Head. Length nearly equal to width, LH 1.03 × WH. Mandible with four apical teeth, ventralmost largest with apex sharp. Clypeus trilobite; medio-clypeal lobe with anterior margin acute medially; medio-clypeal carina not extending into frons, arched in lateral view. Antenna distinctly thickened, at least flagellomeres II–IX shorter than wide. Frons coriaceous and densely foveolate (Fig. 12B); WF 1.33 × LE. Contour of eye distinctly protruding in antero-dorsal view, LE 0.41 × LH, LE 1.63 × DEV. Anterior ocellus entirely anterior to imaginary top line of eyes; POL 1.34 × AOL, OOL 0.79 × WOT, DPV 2.11 × DAO. Sides of head behind eyes rounded and slightly converging posteriorly. Vertex coriaceous and densely foveolate, vertex crest slightly protruding. Malar space 1.2 × distance between posterior ocelli and vertex crest. Gena coriaceous, densely foveolate. Occipital carina complete, occiput coriaceous with shallow punctures. Medioccipito-genal suture present. Hypostomal sulcus present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.57 × width along posterior pronotal margin; median pronotal sulcus present (Fig. 12D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum distinctly elevated, coriaceous with dense punctures (Fig. 12E); median mesonotal sulcus incomplete, present on posterior one-third (Fig. 12E); notauli complete, incurved posteriorly (Fig. 12E); parapsidal signum incomplete, absent on anterior one-third; lateral area of mesoscutum depressed anteriorly. Mesoscutellum coriaceous, densely foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 12E). Median length of dorsal surface of MPC 0.90 × its half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carina of MPC complete, lateral marginal carinae straight (Fig. 12F); propodeal declivity areolate, median and lateral carinae complete; length of PPP 0.45 × median length of dorsal surface of MPC. Lateral surface of MPC areolate, anterior metapleural area transversely striate. Propleuron coriaceous and foveolate. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus weak; ventral surface of mesopleuron coriaceous and shallowly foveolate.

Fig. 12. *Sulcomesitius impressus* Xu, He & Terayama, 2003, holotype, ♀ (ZJUH 823323). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum, dorsal view. **F**. MPC, dorsal view. **G**. T2, dorsal view. **H**. Fore wing. Scale bars: A, C–H = 0.20 mm; B = 0.15 mm.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 0.79 × length of Sc+R_2v; posterior margin of pterostigma straight, prestigma absent (Fig. 12H); Cu_2v present as yellowish-brown trace. Hind wing with four distal hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with tiny sparse punctures; T2 with dense, variably sized punctures, posterior margin without punctures (Fig. 12G); T3–5 with three semi-circular impressions on posterior margin. Metasomal sterna shiny with punctures; S1 irregularly striate, metapostnotal median carina weak; S2–3 with dense punctures separated by less than 2.0 × their diameter.

Male

Unknown.

Distribution

China (Guangxi, Guizhou) (Fig. 20).

Sulcomesitius latibilobatus sp. nov.

urn:lsid:zoobank.org:act:5C37C810-F7CA-4185-ABC3-CF0D39400001

Fig. 13

Diagnosis

This new species can be recognized by its having the median pronotal sulcus present and not distinctly foveolate, the median mesonotal sulcus of the mesoscutum absent, the apex of the PPP acute in lateral view and the hypopygium of the male with the anterior margin broad and the posterior branches long and lobose.

This species can be separated from other species of the genus *Sulcomesitius* by having the antenna with short proclinate setae; dorsal pronotal area with anterolateral corner weakly projected; median mesonotal sulcus of mesoscutum absent; hypopygium with posterior branches wider than median notch.

Etymology

The specific epithet is a combination of '*latus*' (Latin for 'wide') and '*bilobatus*' (Latin for 'bilobed') because both posterior branches of the hypopygium are wider than its posterior median notch.

Material examined

Holotype

CHINA – **Yunnan** • ♂; Yingjiang, Tongbiguan; 23 Jun. 2005; Jingxian Liu leg.; ZJUH 200609145.

Description

Male

Measurements. Body length 4.4 mm. Fore wing length 2.8 mm.

Colouration. Body black. Mandible brown, apical half yellowish brown, teeth brown; maxillary and labial palpi yellowish brown. Antenna brown, yellowish brown ventrally. Fore wing light brown, veins brown or yellowish brown, pterostigma yellowish brown. Legs brown, trochanters, tibiae apically and tarsi yellowish brown. T1 partly dark brown, lateral and posterior margin of T2 dark brown, T3–4 brown with black basally, T5–6 brown; S1 black, S2–4 brown posteriorly, S5–6 brown.

Pubescence. Body with short setae. Maxillary palp and labial palp with dense, short setae. Antenna with short, proclinate setae, 0.25 × width of flagellomere II (Fig. 13C). Eye with sparse short setae, nearly

4.0 × diameter of an ommatidium. Wings with short, dense yellowish-brown setae. Setae of metasoma longer than setae of head and mesosoma, T1 with sparse setae posterolaterally, T2 with basal triangular area glabrous.

Head. Length equal to width, LH 1.0 × WH. Clypeus trilobite; medio-clypeal lobe with apical margin rounded; medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender, length of flagellomere III 1.85 × length of flagellomere II. Frons coriaceous and densely foveolate (Fig. 13B); LE 0.42 × LH, WF 1.31 × LE. Contour of eye distinctly protruding in antero-dorsal view (Fig. 13B); LE 1.46 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes; POL 1.36 × AOL, OOL 0.94 × WOT, DPV 1.38 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes rounded and slightly converging posteriorly, vertex crest slightly protruding. Malar space 1.0 × distance between posterior ocelli and vertex crest. Gena coriaceous, densely foveolate, with shallow foveolae ventrally. Occipital carina complete, occiput coriaceous with shallow punctures. Medioccipito-genal suture present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.36 × width along posterior pronotal margin, anterolateral corner weakly projected; median pronotal sulcus present (Fig. 13D); lateral pronotal area obliquely strigate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous with shallow punctures; median mesonotal sulcus absent (Fig. 13E); notauli complete and converging posteriorly, parapsidal signum shallow and absent near anterior margin. Mesoscutellum weakly coriaceous with shallow punctures, apical two-thirds foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 13E). Median length of dorsal surface of MPC 0.95 × its half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete; length of PPP 0.29 × median length of dorsal surface of MPC (Fig. 13E); transverse posterior carina of MPC complete; propodeal declivity weakly areolate, median and lateral carinae complete; anterior metapleural area transversely striate; lateral surface of MPC with submarginal carina and posterior carina, anterior half of lateral surface of MPC transversely striate, posterior half of lateral surface of MPC areolate. Propleuron coriaceous, foveolate near procoxa, propleural epicoxal sulcus present. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous with punctures, area between mesocoxa with large foveola; anterior mesofurcal pit present.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 0.85 × length of Sc+R_2v; posterior margin of pterostigma protruding, prestigma absent (Fig. 13G); Cu_2v present as yellowish-brown trace. Hind wing with three distal hamuli, distance between 1st and 2nd hamuli longer than distance between 2nd and 3rd hamuli.

Metasoma. Metasomal terga shiny with punctures; T1 with tiny sparse punctures, medio-longitudinal sulcus present on basal one-third; T2 with punctures denser than on T1, posterior margin with scattered punctures. Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak. Hypopygium longer than wide; lateral margin of basal part of hypopygium slightly incurved, anterior margin incurved (Fig. 13H); posterior branches wider than median notch, 0.41 × length of hypopygium, with long setae apically.

Male genitalia. Harpe bilobate, dorsal harpe S-shaped and longer than ventral harpe (Fig. 13I). Cuspis with apical margin incurved (Fig. 13J); digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 13I).

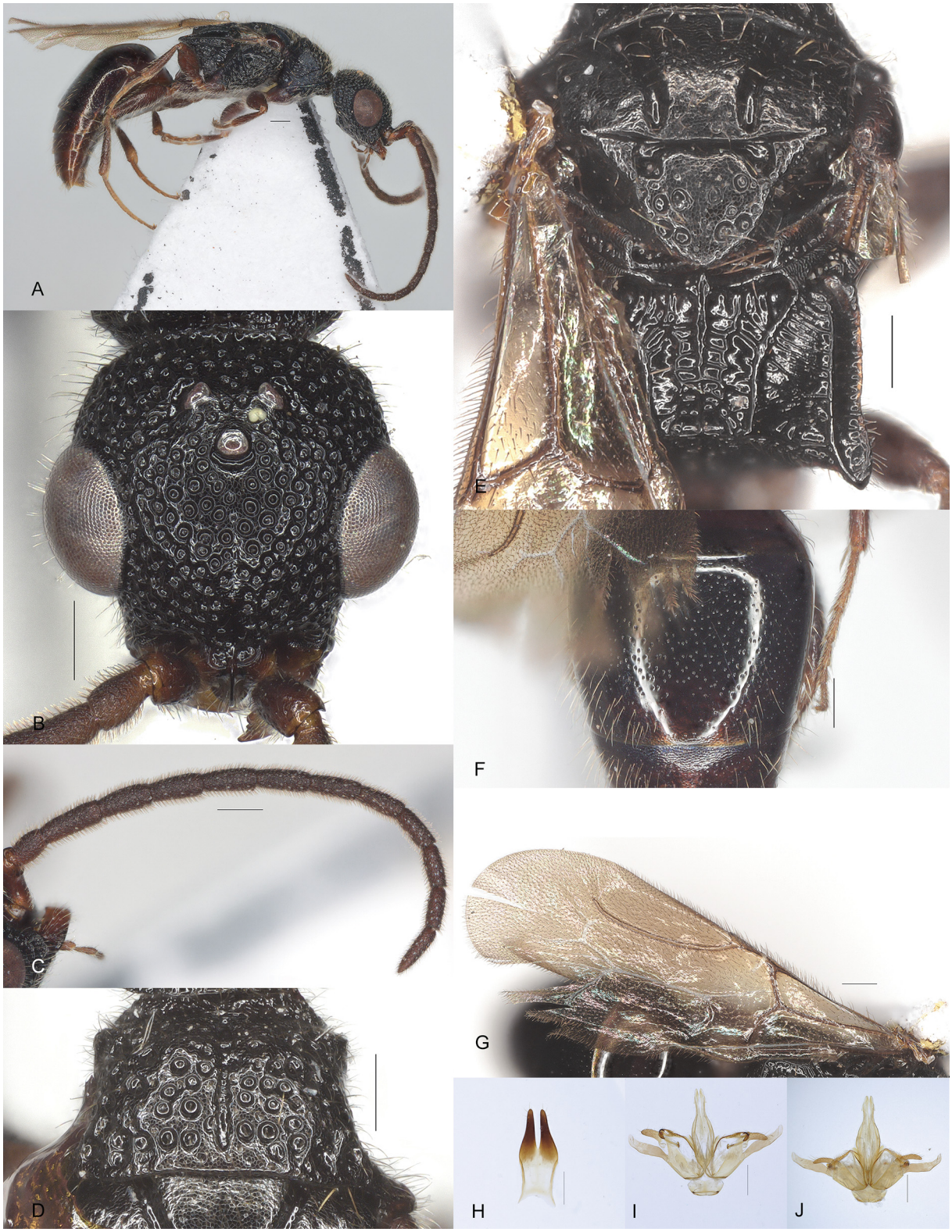


Fig. 13. *Sulcomesitius latibilobatus* sp. nov., holotype, ♂ (ZJUH 200609145). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum and MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: 0.20 mm.

Female

Unknown.

Distribution

China (Yunnan) (Fig. 20).

Sulcomesitius sparsulus sp. nov.

urn:lsid:zoobank.org:act:44B36209-219F-46AD-9526-3CA3F58AC114

Fig. 14

Diagnosis

This new species can be recognized by having the median pronotal sulcus weak, mesoscutum with median impression near posterior margin, PPP distinctly longer than its width at base with apex acute in lateral view, length of posterior branches of the male hypopygium 0.51 × length of hypopygium and dorsal harpe of genitalia longer than ventral harpe.

This species is similar to *S. zhaoi* (Xu & He, 2006). However, the new species can be distinguished by having the mesoscutum shallowly punctured (densely punctured in *S. zhaoi*), the PPP distinctly longer than its width at the base (nearly equal to its width at the base in *S. zhaoi*), the apex of the PPP acute in dorsal view (blunt in *S. zhaoi*), and T2 with shallower and sparser punctures than in *S. zhaoi*.

Etymology

The specific epithet is derived from '*sparsus*' (Latin for 'scattered'), referring to the sparse punctures of T2.

Material examined

Holotype

CHINA – **Hainan** • ♂; Baisha County, Yinggeling; 1–2 May 2008; Jingxian Liu leg.; ZJUH 200800040.

Paratypes (3 ♂♂)

CHINA – **Hainan** • 1 ♂; Bawangling; 7–11 Jul. 2006; Jingxian Liu leg.; ZJUH 200700063 • 1 ♂; Baisha, Nankai County; 29 Apr. 2008; Jingxian Liu leg.; ZJUH 200800018 • 1 ♂; Baisha County, Yinggeling; 1–2 May 2008; Jingxian Liu leg.; ZJUH 200800030.

Description

Male

Measurements (n = 4). Body length 3.42–3.81 mm; length of fore wing 2.02–2.47 mm; LH 1.0–1.01 × WH; WF 1.39–1.54 × LE; LE 0.39–0.41 × LH; LE 1.23–1.38 × DEV; POL 1.44–1.53 × AOL; OOL 0.83–1.0 × WOT; DPV 1.17–1.72 × DAO; malar space 1.11–1.25 × distance between posterior ocelli and vertex crest; median length of dorsal surface of MPC 0.92–0.95 × its half-width; length of PPP 0.38–0.42 × median length of dorsal surface of MPC; length of 2r-rs&Rs_2v 0.81–0.91 × length of Sc+R_2v; length of posterior branches 0.5–0.53 × length of hypopygium.

Colouration. Body black or dark brown. Mandible yellowish brown, teeth brown; maxillary and labial palpi brown. Antenna brown, darker apically and lighter ventrally. Eye brown or dark brown. MPC with lateral margin brown, posterior projection brown apically. Fore wing light brown, darker on apical half; veins dark brown or brown, pterostigma brown. Legs dark brown, trochanters, femora apically, tibiae apically and tarsi brown, protarsus yellowish brown. T1 with posterior and lateral margin dark brown,

posterior margin of T2 and T3 brown, T4 brown, posterior margin of T4 and T5 yellowish brown; S2–4 yellowish brown apically.

Pubescence. Body with short setae. Maxillary and labial palpi with dense, short setae. Antenna with short, suberect yellowish-brown setae, 0.35 × width of flagellomere II (Fig. 14C). Eye with sparse, short setae, nearly 5.0 × diameter of an ommatidium. Wings with short, dense yellowish-brown setae. Setae of metasoma longer than setae of head and mesosoma, T1 with sparse setae posterolaterally, T2 with basal triangular area glabrous.

Head. Length equal to width, LH 1.0 × WH. Clypeus trilobite; medio-clypeal lobe with apical margin slightly acute medially (Fig. 14B); medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender, length of flagellomere III 2.0 × length of flagellomere II. Frons coriaceous and densely foveolate (Fig. 14B); WF 1.46 × LE. Contour of eye slightly protruding in antero-dorsal view (Fig. 14B); LE 0.40 × LH, LE 1.38 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes; POL 1.52 × AOL, OOL 1.0 × WOT, DPV 1.58 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes rounded and slightly converging posteriorly, vertex crest slightly protruding. Malar space 0.89 × distance between posterior ocelli and vertex crest. Gena coriaceous, densely foveolate. Occipital carina complete. Medioccipito-genal suture present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.49 × width along posterior pronotal margin, anterolateral corner weakly projected; median pronotal sulcus weak (Fig. 14D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum distinctly elevated, coriaceous, with variably sized shallow punctures; median mesonotal sulcus absent, with median impression on apical half (Fig. 14E); notauli complete and converging posteriorly, parapsidal signum shallow and absent near anterior margin; lateral area of mesoscutum depressed anteriorly. Mesoscutellum weakly coriaceous with shallow punctures, shallowly foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 14E). Median length of dorsal surface of MPC less than its half-width (0.92); metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete, lateral marginal carina nearly straight (Fig. 14E); length of PPP 0.38 × median length of dorsal surface of MPC (Fig. 14E); transverse posterior carina of MPC complete; propodeal declivity weakly areolate, median and lateral carinae complete; anterior metapleural area transversely striate; lateral surface of MPC with submarginal carina and posterior carina, irregularly striate. Mesopleuron coriaceous and densely foveolate; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous, with irregular-sized punctures, area between mesocoxa with large foveae; postepicnemial sulcus; anterior mesofurcal pit present.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 0.92 × as long as Sc+R_2v; posterior margin of pterostigma protruding, prestigma absent (Fig. 14G); Cu_2v present as yellowish-brown trace. Hind wing with three distal hamuli, distance between 1st and 2nd distal hamuli longer than distance between 2nd and 3rd distal hamuli.

Metasoma. Metasomal terga shiny, with punctures; T1 with tiny sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with dense punctures separated less than 3.0 × their diameter, posterior margin with scattered punctures. Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak; S2 with dense, variably sized punctures. Hypopygium longer than wide; basal part of hypopygium with lateral and anterior margin incurved (Fig. 14H); posterior branches 0.51 × length of hypopygium, distinctly narrower than median notch, with long setae apically.

Fig. 14. *Sulcomesitius sparsulus* sp. nov., holotype, ♂ (ZJUH 200800040). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum and MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: 0.20 mm.

Male genitalia. Harpe bilobate, dorsal harpe S-shaped and longer than ventral harpe (Fig. 14I). Cuspis with apical margin incurved; digitus bent and papillate apically, with setae basally (Fig. 14J); aedeagus bottle-shaped (Fig. 14I).

Female

Unknown.

Distribution

China (Hainan) (Fig. 20).

Sulcomesitius zhaoi (Xu & He, 2006) comb. nov.
Fig. 15

Heterocoelia zhaoi Xu & He, 2006: 64–65, 67, figs 4–6.
Heterocoelia sinensis Xu & He, 2006: 65–67, figs 7–9. **Syn. nov.**

Material examined

Holotype

CHINA – **Fujian** • ♂; Fuzhou; 19 Sept. 1990; Xiufu Zhao leg.; ZJUH 967700.

Paratype (1 ♂)

CHINA – **Fujian** • 1 ♂; Fuzhou; 13 Aug. 1989; Changming Liu leg.; ZJUH 966312.

Other material (6 ♂♂)

CHINA – **Fujian** • ♂; holotype of *Heterocoelia sinensis*; Fuzhou; 3 Jul. 1990; Naiquan Lin leg.; ZJUH 967530 • 1 ♂; Fuzhou, Jin Mountain; 30 May 2001; Naiquan Lin leg.; ZJUH 202300002 • 1 ♂; Minqing, Xiongjiang Town; 13–17 Jul. 2005; Zaifu Xu leg.; ZJUH 200609182. – **Hainan** • 2 ♂♂; Bawangling; 7–11 Jul. 2006; Jingxian Liu leg.; ZJUH 200700036, 200700078 • 1 ♂; Baisha County, Yinggeling; 1–2 May 2008; Jingxian Liu leg.; ZJUH 200800043.

Re-description

Male

Measurements (n = 8). TL 4.84–6.21 mm; length of fore wing 2.46–3.29 mm; LH 1.0–1.03 × WH; WF 1.53–1.75 × LE; LE 1.06–1.33 × DEV; POL 1.33–1.61 × AOL; OOL 0.92–0.99 × WOT; DPV 1.55–2.39 × DAO; malar space 1.0–1.38 × distance between posterior ocelli and vertex crest; median length of dorsal surface of MPC 0.73–0.86 × its half-width; length of PPP 0.37–0.61 × median length of dorsal surface of MPC; 2r-rs&Rs_2v 0.71–0.96 × as long as Sc+R_2v; length of posterior branches of hypopygium 0.45–0.5 × length of hypopygium.

Colouration. Body black. Mandible yellowish brown or brown, apical half yellowish brown; maxillary and labial palpi brown or dark brown. Antenna dark brown with ventral surface brown. Eye brown or dark brown. Fore wing light brown, darker on apical half; veins dark brown or brown, pterostigma brown. Legs dark brown or blackish brown, trochanters, femora apically, tibiae and tarsi brown and yellowish brown. MPC with lateral margin brown, PPP brown apically. T1 with lateral and posterior margin dark brown, S2 apically and S3 posteriorly brown, T4–5 brown with posterior margin yellowish brown.

Pubescence. Body with short setae. Maxillary and labial palpi with dense, short setae. Antenna with short proclinate yellowish-brown setae, 0.22 × width of flagellomere II (Fig. 15C). Eye with sparse, short setae, nearly 5.0 × diameter of an ommatidium. Wings with short, dense yellowish-brown setae.

Setae of metasoma longer than setae of head and mesosoma, T1 with sparse setae posterolaterally, T2 with basal triangular area glabrous.

Head. Slightly longer than wide, LH 1.03× WH. Clypeus trilobite; medio-clypeal lobe with apical margin acute medially; medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender, length of flagellomere III 2.0× its width. Frons coriaceous and densely foveolate (Fig. 15B); WF 1.67× LE. Contour of eye protruding in antero-dorsal view (Fig. 15B); LE 0.35–0.39× LH; LE 1.09× DEV. Anterior ocellus entirely anterior to imaginary top line of eyes; POL 1.36× AOL, OOL 0.98× WOT, DPV 2.39× DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes rounded and slightly converging posteriorly, vertex crest slightly protruding. Malar space 1.22× distance between posterior ocelli and vertex crest. Gena coriaceous, densely foveolate and shallower ventrally. Occipital carina complete, occiput coriaceous with shallow punctures. Medioccipito-genal suture present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.45× width along posterior pronotal margin, anterolateral corner projected; median pronotal sulcus weak (Fig. 15D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous with shallow punctures; median mesonotal sulcus absent (Fig. 15D); notauli complete and converging posteriorly, parapsidal signum shallow and absent near anterior margin. Mesoscutellum weakly coriaceous with shallow punctures, apical two-thirds foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 15E); median line slightly elevated. Median length of dorsal surface of MPC 0.86× its half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete; length of PPP 0.37× median length of dorsal surface of MPC (Fig. 15E); transverse posterior carina of MPC complete; propodeal declivity weakly areolate, median and lateral carinae complete; anterior metapleural area transversely striate; lateral surface of MPC with submarginal carina and posterior carina, irregularly striate. Propleuron coriaceous, shallowly foveolate, propleural epicoxal sulcus present. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous, with irregular-sized punctures, area between mesocoxae with large foveae; anterior mesofurcal pit present.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 0.81× as long as Sc+R_2v; posterior margin of pterostigma protruding, prestigma absent (Fig. 15G); Cu_2v present as yellowish-brown trace. Hind wing with three distal hamuli, distance between 1st and 2nd distal hamuli longer than distance between 2nd and 3rd distal hamuli.

Metasoma. Metasomal terga shiny, with punctures; T1 with tiny, sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with dense punctures separated by less than 3.0× their diameter, posterior margin with scattered punctures (Fig. 15F). Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak; S2 with dense, variably sized punctures. Hypopygium longer than wide; lateral and anterior margin of basal part of hypopygium incurved (Fig. 15H); posterior branches 0.5× length of hypopygium, distinctly narrower than median notch, with long setae apically.

Male genitalia. Harpe bilobate, dorsal harpe S-shaped and longer than ventral harpe (Fig. 15I). Cuspis with apical margin incurved; digitus bent and papillate apically, with setae basally (Fig. 15J); aedeagus bottle-shaped (Fig. 15I).

Female

Unknown.

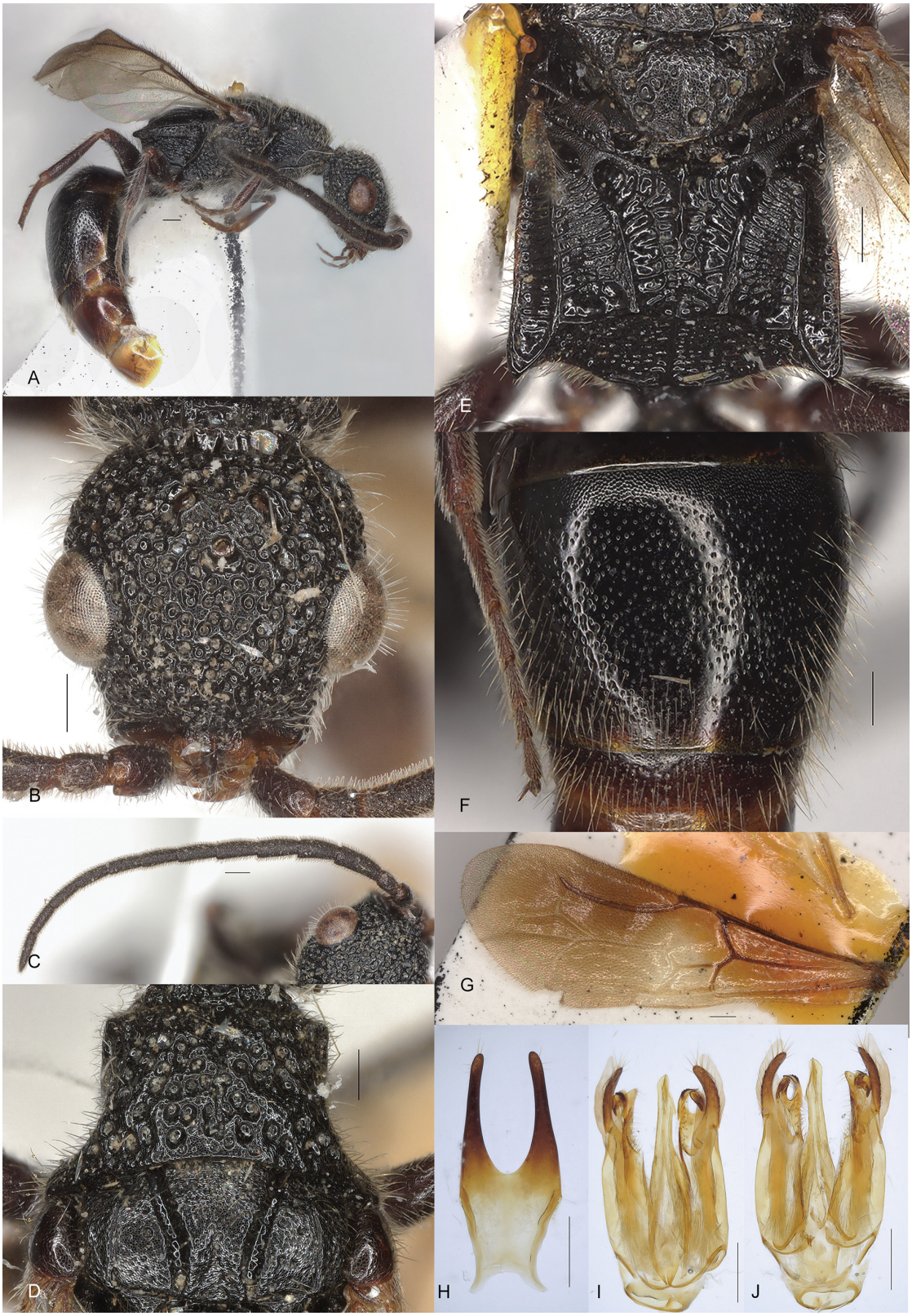


Fig. 15. *Sulcomesitius zhaoi* (Xu & He, 2006) comb. nov., holotype, ♂ (ZJUH 967700). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum and mesoscutum, dorsal view. **E**. Mesoscutellum and MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: 0.20 mm.

Distribution

Oriental Region (China: Fujian, Hainan) (Fig. 20).

Remarks

After an examination of the type series of *Heterocoelia zhaoi* Xu & He, 2006 and *H. sinensis* Xu & He, 2006, we transfer both taxa to the genus *Sulcomesitius* because their head and pronotum are densely foveolate; the hypopygium of the male is longer than wide, with the posterior branches long, at least 0.45 × the length of the hypopygium; the dorsal harpe of the genitalia is S-shaped.

Heterocoelia sinensis used to be distinguished from *H. zhaoi* by having the length of PPP 0.60 × the median length of the dorsal surface of MPC (0.4 × in *H. zhaoi*) and T2 densely and deeply punctate throughout, with uniform punctures (broadly granulate basally, distinctly punctate posteriorly, with uniform punctures in *H. zhaoi*) (Xu & He 2006). Our re-examination of the holotypes of both taxa suggests their conspecificity since both holotypes have the PPP 0.50 × the median length of the dorsal surface of MPC. As for the difference in sculpture of T2, this may be an artefact; therefore, it is insufficient to retain *H. sinensis* as a valid species.

Genus ***Zimankos*** Argaman, 2003

Zimankos Argaman, 2003: 80–81. Type species: *Mesitius alluaudi* Kieffer, 1913: 7.

Diagnosis

Head and pronotum densely foveolate. Malar space usually as long as VOL. Male antenna with suberect setae, nearly equal to half-width of flagellomere; anterior ocellus of male usually entirely anterior to the imaginary top line of eyes in antero-dorsal view. Dorsal pronotal area usually with anterolateral corner distinctly projected. T2 usually with scattered punctures. Hypopygium of male with posterior branches long and slender, lateral and anterior margin of basal part of hypopygium distinctly incurved. Hind wing with at least four distal hamuli.

Host

Unknown.

Distribution

Afrotropical and Oriental Regions.

Key to the Chinese species of the genus *Zimankos* Argaman, 2003

1. Hind wing with five distal hamuli ..... ***Z. hamulosus*** sp. nov.
– Hind wing with four distal hamuli 2

2. Dorsal pronotal area coriaceous and shallowly foveolate; anterolateral corner of pronotum rectangular or forming an obtuse angle laterally, at most sometimes slightly projected ..... ***Z. mahunkai*** (Móczár, 1981)
– Dorsal pronotal area coriaceous and densely foveolate; anterolateral corner of pronotum usually distinctly projected, lateral sides very concave 3

3. PPP short, nearly equal to width at base, apical margin acute in lateral view; width of hypopygial posterior notch three-fifths width of hypopygium ..... ***Z. acutulus*** sp. nov.
– Length of PPP 2.0 × width at base, apical margin rounded in lateral view; width of hypopygial posterior notch at least two-thirds width of hypopygium ..... ***Z. cambodianus*** **(**Móczár, 1976)

Zimankos acutulus sp. nov.
urn:lsid:zoobank.org:act:686744DD-BF0C-4087-91C9-380D8B877806
Fig. 16

Diagnosis

This new species is similar to *Z. cambodianus* (Móczár, 1976) in having the anterolateral corner of the dorsal pronotal area distinctly projected and the PPP shorter than half-length of the dorsal surface of MPC. However, it can be distinguished by having the length of PPP nearly equal to the width at its base and the apical margin of PPP acute in lateral view (rounded in *Z. cambodianus*); the pterostigma with the posterior margin straight (protruding in *Z. cambodianus*); the posterior branches of the hypopygium 0.36 × the length of the hypopygium (0.48 × the length of the hypopygium in *Z. cambodianus*).

Etymology

The specific epithet refers to the short and acute PPP in lateral view; '*acutus*' is Latin for 'sharp'.

Material examined

Holotype
CHINA – **Sichuan** • ♂; Panzhihua, Ertan; 30 Jul. 2006; Zhilei Gao leg.; ZJUH 200611246.

Description

Male
Measurements. Body length 6.21 mm. Length of forewing 3.57 mm.

Colouration. Black. Mandible brown. Antenna brown, darker apically. Fore wing hyaline, light brown; veins yellowish brown or brown, pterostigma yellowish brown. Legs dark brown, trochanters, femora apically, tibiae and tarsi brown. T1 posteriorly, T2 apical half and T4–5 yellowish brown.

Pubescence. Body with short setae. Maxillary and labial palpi with dense, short setae. Antenna with short, suberect setae, 0.16 × width of flagellomere II (Fig. 16C). Eye with sparse, short setae, nearly 6.0 × diameter of an ommatidium. Wings with short, dense brown setae. Setae of metasoma longer than setae of head and mesosoma, T1 nearly glabrous, T2 with basal triangular area glabrous.

Head. Shorter than wide, LH 0.94 × WH. Clypeus trilobite, anterior margin of medio-clypeal lobe acute medially; medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender. Frons coriaceous and densely foveolate, median frontal line absent (Fig. 16B); WF 1.59 × LE. Contour of eye protruding in antero-dorsal view (Fig. 16B); LE 0.41 × LH, LE 1.27 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes; POL 1.58 × AOL, OOL 0.98 × WOT, DPV 2.32 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes nearly parallel, vertex crest protruding. Gena coriaceous, densely foveolate, with shallow foveolae ventrally. Occipital carina complete.

Mesosoma. Dorsal pronotal area coriaceous and foveolate, median length 0.49 × width along posterior pronotal margin, anterolateral corner distinctly projected; median pronotal sulcus present (Fig. 16D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous with dense punctures; median mesonotal sulcus present on apical one-third, foveolate (Fig. 16E); notauli complete and converging posteriorly, parapsidal signum shallow, absent near anterior margin. Mesoscutellum coriaceous and foveolate; mesoscutum-mesoscutellar sulcus arched, laterally dilated (Fig. 16E). Median length of dorsal surface of MPC equal to its half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly (Fig. 16E); dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete; length of PPP 0.32 × median length of dorsal surface of MPC

Fig. 16. *Zimankos acutulus* sp. nov., holotype, ♂ (ZJUH 200611246). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum and MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: 0.20 mm.

(Fig. 16E); transverse posterior carina of MPC complete; propodeal declivity weakly transversely striate, areolate near posterior marginal carina, median and lateral carinae complete; anterior metapleural weakly striate; lateral surface of MPC areolate, submarginal and posterior carinae present. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous and shallowly foveolate; anterior mesofurcal pit present and deep.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 1.12 × as long as Sc+R_2v; posterior margin of pterostigma protruding, prestigma absent (Fig. 16G); Cu_2v present as light yellowish-brown trace. Hind wing with four distal hamuli.

Metasoma. Metasomal terga shiny, with punctures; T1 with shiny, sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with dense punctures. Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak; S2 with dense, variably sized punctures. Length of hypopygium 2.18 × its width; lateral and anterior margin of basal part of hypopygium distinctly incurved (Fig. 16H); posterior branches 0.36 × length of hypopygium, distinctly narrower than median notch; apical margin of posterior branches and bottom of posterior median notch with long setae.

Male genitalia. Harpe bilobate, dorsal harpe filamentary (Fig. 16I), ventral harpe finger-like, with long setae (Fig. 16J). Cuspis with apical margin incurved; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 16I).

Female

Unknown.

Distribution

China (Sichuan) (Fig. 20).

Zimankos cambodianus (Móczár, 1976)
Fig. 17

Sulcomesitius cambodianus Móczár, 1976: 283–284.
Sulcomesitius rectus Xu, He & Terayama, 2003: 329–330. **Syn. nov.**

Zimankos cambodianus – Azevedo *et al*. 2018: 207.

Material examined (8 ♂♂)

CHINA – **Henan** • 1 ♂; Baotianman; 13–15 Jul. 1998; Xuexin Chen leg.; ZJUH 991803. – **Zhejiang** • 1 ♂; paratype of *Sulcomesitius rectus*; Qingyuan; 26–27 Jul. 1985; Quancong Wu leg.; ZJUH 851898 • 1 ♂; Tianmu Mountain; 27 Jul. 1988; Ying Qian leg.; ZJUH 940245 • 1 ♂; Songyang; 27 Jun. 1994; Hanlin Chen leg.; ZJUH 954190 • 1 ♂; Xitianmu Mountain; 28 Jul. 2003; Xiaoxia Yu leg.; ZJUH 20039255. – **Fujian** • 1 ♂; Wuyi Mountain; 20 Jul. 1985; Naiquan Lin leg.; ZJUH 968094. – **Guangdong** • 1 ♂; Xinfeng, Yunjin Mountain; 19 Jun. 2002; Zaifu Xu leg.; ZJUH 20029190. – **Guangxi** • 1 ♂; holotype of *Sulcomesitius rectus*; Liuzhou; 9 Jun. 1982; Junhua He leg.; ZJUH 822502.

Re-description

Male

Measurements (n = 8). LH 0.93–1.0 × WH; WF 1.36–1.48 × LE; LE 0.41–0.45 × LH; LE 1.36–1.75 × DEV; POL 1.58–1.97 × AOL; OOL 0.82–1.03 × WOT; DPV 0.63–1.72 × DAO; malar space 1.52–2.08 ×

distance between posterior ocelli and vertex crest; median length of dorsal pronotal area 0.4–0.49 × width along posterior pronotal margin; median length of dorsal surface of MPC 0.96–1.05 × its half-width; length of PPP 0.29–0.33 × median length of dorsal surface of MPC; length of posterior branches of hypopygium 0.42–0.5 × length of hypopygium.

Colouration. Body black. Mandible yellowish brown, teeth reddish brown; maxillary and labial palpi yellowish brown. Antenna brown, darker apically. Fore wing hyaline, yellowish brown; veins yellowish brown, pterostigma light brown. Legs brown, coxae dark brown. T1 dark brown, T2 black with posterior and lateral margin brown; T3–4 brown.

Pubescence. Body with short setae. Maxillary and labial palpi with dense, short setae. Antenna with short, suberect setae, 0.47 × width of flagellomere II (Fig. 17C). Eye with sparse, short setae, nearly 5.0 × diameter of an ommatidium. Wings with short, dense brown setae. Setae of metasoma longer than setae of head and mesosoma, T1 nearly glabrous, T2 with basal triangular area glabrous.

Head. Shorter than wide, LH 0.96 × WH. Clypeus trilobite, medio-clypeal lobe with apical margin acute medially; medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender. Frons coriaceous and densely foveolate, median frontal line absent (Fig. 17B); WF 1.48 × LE. Contour of eye protruding in antero-dorsal view; LE 0.43 × LH, LE 1.59 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes; POL 1.58 × AOL, OOL 0.95 × WOT, DPV 1.38 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes nearly parallel, vertex crest protruding. Gena coriaceous, densely foveolate, with shallow foveolae ventrally. Occipital carina complete. Medioccipito-genal suture present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.47 × width along posterior pronotal margin, anterolateral corner projected; median pronotal sulcus foveolate (Fig. 17D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous, with dense punctures; median mesonotal sulcus fovea-like, present near posterior margin (Fig. 17E); notauli complete and converging posteriorly, parapsidal signum shallow and absent near anterior margin. Mesoscutellum slightly elevated, coriaceous and foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated. Median length of dorsal surface of MPC nearly equal to its half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete (Fig. 17F); length of PPP 0.29 × median length of dorsal surface of MPC; transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; anterior metapleural area shiny, weakly striate; lateral surface of MPC areolate, submarginal and posterior carinae present. Propleuron coriaceous, foveolate near procoxa. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous and shallowly foveolate; anterior mesofurcal pit present and deep.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically, 1.12 × length of Sc+R_2v; posterior margin of pterostigma protruding, prestigma absent (Fig. 17H); Cu_2v present as light yellowish-brown trace. Hind wing with four distal hamuli.

Metasoma. Metasomal terga shiny, with punctures; T1 with shiny sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with punctures (Fig. 17G). Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak; S2 with dense, variably sized punctures. Hypopygium longer than wide; lateral and anterior margin of basal part of hypopygium distinctly incurved (Fig. 17I); length of posterior branches 0.48 × length of hypopygium, distinctly

Fig. 17. *Zimankos cambodianus* (Móczár, 1976), ♂ (ZJUH 940245). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum, dorsal view. **F**. MPC, dorsal view. **G**. T2, dorsal view. **H**. Fore wing. **I**. Hypopygium. **J**. Genitalia, dorsal view. **K**. Genitalia, ventral view. Scale bars: 0.20 mm.

narrower than median notch; apical margin of posterior branches and bottom of posterior median notch with long setae.

Male genitalia. Harpe bilobate, dorsal harpe filamentary (Fig. 17J), ventral harpe finger-like, with long setae (Fig. 17K). Cuspis with apical margin incurved; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 17J).

Female

Unknown.

Distribution

China (Henan, Zhejiang, Fujian, Guangdong, Guangxi) (Fig. 20), Cambodia, Laos.

Remarks

The specimens (numbered ZJUH 822502, 851898) belonging to the type series of *Sulcomesitius rectus* Xu, He & Terayama, 2003, the specimen numbered 954190 being identified as *S. vechti* Móczár, 1979 and the specimens numbered 991803 and 940245 as *S. laoensis* Móczár, 1976 were included in the genus *Sulcomesitius* by Xu *et al.* (2003) because of the obtuse anterior corners of the clypeus laterally, the mesoscutum with median mesonotal sulcus being well developed and the PPP long and with a sharp apex in dorsal view, whereas the shape of the hypopygium, which is the main character for the generic identification of the males, was not examined. After re-examination of all the specimens mentioned above, we transferred them to the species *Zimankos cambodianus* under the genus *Zimankos* because all of them have the hypopygium with the posterior branches filamentary (lobose in *Sulcomesitius*) (Fig. 17I), the dorsal harpe of the genitalia is filamentary and distinctly narrower than the ventral harpe (S-shaped or 8-shaped, at least as wide as the ventral harpe in *Sulcomesitius*) and the dorsal pronotal area has the anterolateral corner projected (weakly projected in *Sulcomesitius*).

Zimankos hamulosus sp. nov.

urn:lsid:zoobank.org:act:92E51160-3B20-4E76-9E16-47014EB1FD77

Fig. 18

Diagnosis

This new species is similar to *Z. cambodianus* in having the PPP with the apical margin rounded in lateral view. However, it can be distinguished from the latter by having the hind wing with five distal hamuli (four in *Z. cambodianus*).

Etymology

The specific epithet is derived from the hamuli ('*hamulus*' is Latin for 'small hook'), because members of this species have five distal hamuli on the hind wing.

Material examined

Holotype

CHINA – **Zhejiang** • ♂; Longquan, Fengyang Mountain; 4 Aug. 2008; Jingxian Liu leg.; ZJUH 200801198.

Description

Male

Measurements. Body length 5.48 mm. Length of forewing 3.26 mm.

Colouration. Body black. Mandible yellowish brown, teeth brown. Antenna brown, darker apically. Fore wing hyaline, brown; veins and pterostigma dark brown. Legs dark brown, trochanters, femora apically and tibiae brown, tarsi yellowish brown. Lateral and posterior margin of T2 brown; apical half of T3 and T4–5 brown.

Pubescence. Body with short setae. Maxillary and labial palpi with dense, short setae. Antenna with short setae, length of setae 0.19 × width of flagellomere II (Fig. 18C). Eye with sparse, short setae, nearly 5.0 × diameter of an ommatidium. Wings with short, dense brown setae. Setae of metasoma longer than setae of head and mesosoma, T1 nearly glabrous, T2 with basal triangular area glabrous.

Head. Shorter than wide, LH 0.95 × WH. Clypeus trilobite, medio-clypeal lobe with apical margin acute medially; medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender. Frons coriaceous and densely foveolate, median frontal line weak (Fig. 18B); WF 1.54 × LE. Contour of eye protruding in antero-dorsal view (Fig. 18B); LE 0.41 × LH; LE 1.41 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes; POL 1.57 × AOL, OOL 0.85 × WOT, DPV 1.56 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes nearly parallel, vertex crest protruding. Gena coriaceous, densely foveolate, with shallow foveolae ventrally. Occipital carina complete. Medioccipito-genal suture present.

Mesosoma. Dorsal pronotal area coriaceous and densely foveolate, median length 0.46 × width along posterior pronotal margin, anterolateral corner angled; median pronotal sulcus nearly complete (Fig. 18D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous with dense punctures; median mesonotal sulcus present on apical one-third and foveolate (Fig. 18E); notauli complete and converging posteriorly, parapsidal signum absent near anterior margin. Mesoscutellum elevated, coriaceous and foveolate; mesoscutum-mesoscutellar sulcus arched, laterally slightly dilated (Fig. 18E). Median length of dorsal surface of MPC 0.95 × half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly (Fig. 18F); dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete; length of PPP 0.32 × median length of dorsal surface of MPC (Fig. 18F); transverse posterior carina of MPC complete; propodeal declivity areolate, median and lateral carinae complete; anterior metapleural area shiny, weakly striate; lateral surface of MPC obliquely striate, submarginal and posterior carinae present. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron present and foveolate; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous and shallowly foveolate; anterior mesofurcal pit present and deep.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma straight, prestigma absent (Fig. 18H); Cu_2v present as light yellowish-brown trace. Hind wing with five hamuli.

Metasoma. Metasomal terga shiny, with punctures; T1 with shiny, sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with dense punctures. Metasomal sterna shiny, with variably sized punctures (Fig. 18G); S1 irregularly striate, metapostnotal median carina weak; S2 with dense, variably sized punctures. Hypopygium longer than wide, length 2.1 × its width; lateral and anterior margin of basal part of hypopygium distinctly incurved (Fig. 18I); posterior branches 0.48 × length of hypopygium, distinctly narrower than median notch; apical margin of posterior branches and bottom of posterior median notch with long setae.

Male genitalia. Harpe bilobate, dorsal harpe filamentary (Fig. 18J), ventral harpe finger-like, with long setae (Fig. 18K). Cuspis with apical margin incurved; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 18J).

Fig. 18. *Zimankos hamulosus* sp. nov., holotype, ♂ (ZJUH 200801198). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum, dorsal view. **E**. Mesonotum, dorsal view. **F**. MPC, dorsal view. **G**. T2, dorsal view. **H**. Fore wing. **I**. Hypopygium. **J**. Genitalia, dorsal view. **K**. Genitalia, ventral view. Scale bars: 0.20 mm.

Female

Unknown.

Distribution

China (Zhejiang) (Fig. 20).

Zimankos mahunkai (Móczár, 1981)

Fig. 19

Sulcomesitius mahunkai Móczár, 1981: 359–360.

Zimankos mahunkai – Azevedo *et al*. 2018: 207.

Material examined (27 ♂♂)

CHINA – **Fujian** • 1 ♂; Chongan, Qilichang; 25 Jul. 1985; Minghui Liu leg.; ZJUH 202300003 • 1 ♂; Minqing, Xiongjiang; 13–17 Jul. 2005; Zaifu Xu leg.; ZJUH 200609183. – **Hainan** • 3 ♂♂; Bawangling; 7–11 Jul. 2006; Jingxian Liu leg.; ZJUH 200700006, 200700086, 200700129 • 4 ♂♂; Jianfengling; 12–15 Jul. 2006; Liqiong Weng leg.; ZJUH 200700404, 200700405, 200700471, 200700503 • 5 ♂♂; Jianfengling; 12–15 Jul. 2006; Wenyong Zhang leg.; ZJUH 200700651, 200700653, 200700657, 200700660, 200700673 • 1 ♂; Jianfengling; 12–15 Jul. 2006; Feitian Chen leg.; ZJUH 200700712 • 1 ♂; Diaoluoshan; 16–17 Jul. 2006; Wenyong Zhang leg.; ZJUH 200701506 • 1 ♂; Diaoluoshan; 16–17 Jul. 2006; Tianfei Chen leg.; ZJUH 200701562 • 1 ♂; Wuzhishan, Suiman; 16–18 May 2007; Jiezeng leg.; ZJUH 201800023 • 4 ♂♂; Yinggeling; 28 May–3 Jun. 2007; Liqiong Weng leg.; ZJUH 200706916, 200706929, 200706936, 200706938 • 2 ♂♂; Baisha, Nankai County; 20 Jun. 2008; Jingxian Liu leg.; ZJUH 200800021, 200800025. – **Guangxi** • 1 ♂; Guilin, Maoershan; 2–10 Aug. 2005; Binxiao leg.; ZJUH 200609382. – **Yunnan** • 1 ♂; Yingjiang, Tongbiguan; 23 Jun. 2005; Jingxian Liu leg.; ZJUH 200609151 • 1 ♂; Gaoligong Mountain; 20–21 Jul. 2006; Jie Zeng leg.; ZJUH 200701075.

Re-description

Male

Measurements (n = 27). LH 0.95–0.99 × WH; WF 1.16–1.45 × LE; LE 0.43–0.49 × LH; LE 1.46–2.12 × DEV; POL 1.49–1.87 × AOL; OOL 0.69–0.91 × WOT; DPV 0.78–1.57 × DAO; median length of dorsal pronotal area 0.43–0.51 × width along posterior pronotal margin; median length of dorsal surface of MPC 1.07–1.21 × its half-width; length of PPP 0.21–0.31 × median length of dorsal surface of MPC; length of hypopygium 1.90–2.42 × its width; length of posterior branches 0.39–0.52 × length of hypopygium.

Colouration. Body black. Mandible brown; maxillary and labial palpi brown. Antenna brown, darker apically. Fore wing hyaline, yellowish brown; veins yellowish brown to brown, pterostigma yellowish brown. Legs brown, trochanters, tibiae and tarsi yellowish brown. T1 dark brown, T2 black with posterior and lateral margin brown; T3–4 brown.

Pubescence. Body with short setae. Maxillary and labial palpi with dense, short setae. Antenna with short, suberect setae, 0.33 × width of flagellomere I (Fig. 19C). Eye with sparse, short setae, nearly 5.0 × diameter of an ommatidium. Wings with short, dense brown setae. Setae of metasoma longer than setae of head and mesosoma, T1 nearly glabrous, T2 with basal triangular area glabrous.

Head. Slightly shorter than wide, LH 0.97 × WH. Clypeus trilobite, medio-clypeal lobe with anterior margin acute medially; medio-clypeal carina not extending into frons, arched in lateral view. Antenna slender. Frons coriaceous and densely foveolate, median frontal line absent (Fig. 19B); WF 1.16 × LE. Contour of eye protruding in antero-dorsal view; LE 0.49 × LH, LE 2.12 × DEV. Anterior ocellus partly anterior to imaginary top line of eyes in antero-dorsal view; POL 1.52 × AOL, OOL 0.83 × WOT, DPV 0.93 × DAO. Vertex coriaceous and densely foveolate, sides of head behind eyes rounded, vertex

Fig. 19. *Zimankos mahunkai* (Móczár, 1981), ♂ (ZJUH 200700404). **A**. Habitus, lateral view. **B**. Head, antero-dorsal view. **C**. Antenna. **D**. Pronotum and mesoscutum, dorsal view. **E**. Mesoscutellum and MPC, dorsal view. **F**. T2, dorsal view. **G**. Fore wing. **H**. Hypopygium. **I**. Genitalia, dorsal view. **J**. Genitalia, ventral view. Scale bars: 0.20 mm.

crest protruding. Gena coriaceous, densely foveolate, with shallow foveolae ventrally. Occipital carina complete. Medioccipito-genal suture present.

Mesosoma. Dorsal pronotal area coriaceous, with shallower and bigger foveae than on head, median length of dorsal pronotal area 0.44 × width along posterior pronotal margin, anterolateral corner projected; median pronotal sulcus present and weakly foveolate (Fig. 19D); lateral pronotal area obliquely striate; cervical pronotal area coarse. Mesoscutum elevated, coriaceous, with punctures; median mesonotal sulcus present as a big fovea near posterior margin (Fig. 19D); notauli complete and converging posteriorly, parapsidal signum shallow and absent near anterior margin. Mesoscutellum coriaceous and foveolate; mesoscutum-mesoscutellar sulcus present, laterally dilated (Fig. 19E). Median length of dorsal surface of MPC 1.15 × half-width; metapostnotum strongly areolate, metapostnotal median carina complete, metapostnotal-propodeal carina complete and converging posteriorly; dorsal propodeal area transversely striate; paraspiracular and lateral marginal carinae of MPC complete; length of PPP 0.26 × as long as median length of dorsal surface of MPC, transverse posterior carina of MPC complete (Fig. 19E); propodeal declivity weakly areolate, median and lateral carinae complete; anterior metapleural area shiny, weakly striate; lateral surface of MPC areolate, submarginal and posterior carinae present. Propleuron coriaceous, foveolate near procoxa. Mesopleuron coriaceous and densely foveolate; subalar impression weak; posterior oblique sulcus of mesopleuron absent; postepicnemial sulcus present; ventral surface of mesopleuron coriaceous and shallowly foveolate; anterior mesofurcal pit present and deep.

Wings. Fore wing with 2r-rs&Rs_2v slightly curved apically; posterior margin of pterostigma protruding, prestigma absent (Fig. 19G); Cu_2v present as light yellowish-brown trace. Hind wing with four distal hamuli.

Metasoma. Metasomal terga shiny, with punctures; T1 with shiny, sparse punctures, medio-longitudinal sulcus present at basal one-third; T2 with punctures (Fig. 19G). Metasomal sterna shiny, with variably sized punctures; S1 irregularly striate, metapostnotal median carina weak; S2 with dense, variably sized punctures. Hypopygium longer than wide; lateral and anterior margin of basal part of hypopygium distinctly incurved (Fig. 19H); posterior branches 0.39 × as long as length of hypopygium, distinctly narrower than median notch; apical margin of posterior branches and bottom of posterior median notch with long setae.

Male genitalia. Harpe bilobate, dorsal harpe filamentary (Fig. 19I), ventral harpe finger-like, with long setae (Fig. 19J). Cuspis with apical margin incurved; digitus bent and papillate apically, with setae basally; aedeagus bottle-shaped (Fig. 19I).

Female

Unknown.

Distribution

China (Fujian, Hainan, Guangxi, Yunnan) (Fig. 20), Vietnam. New record for China.

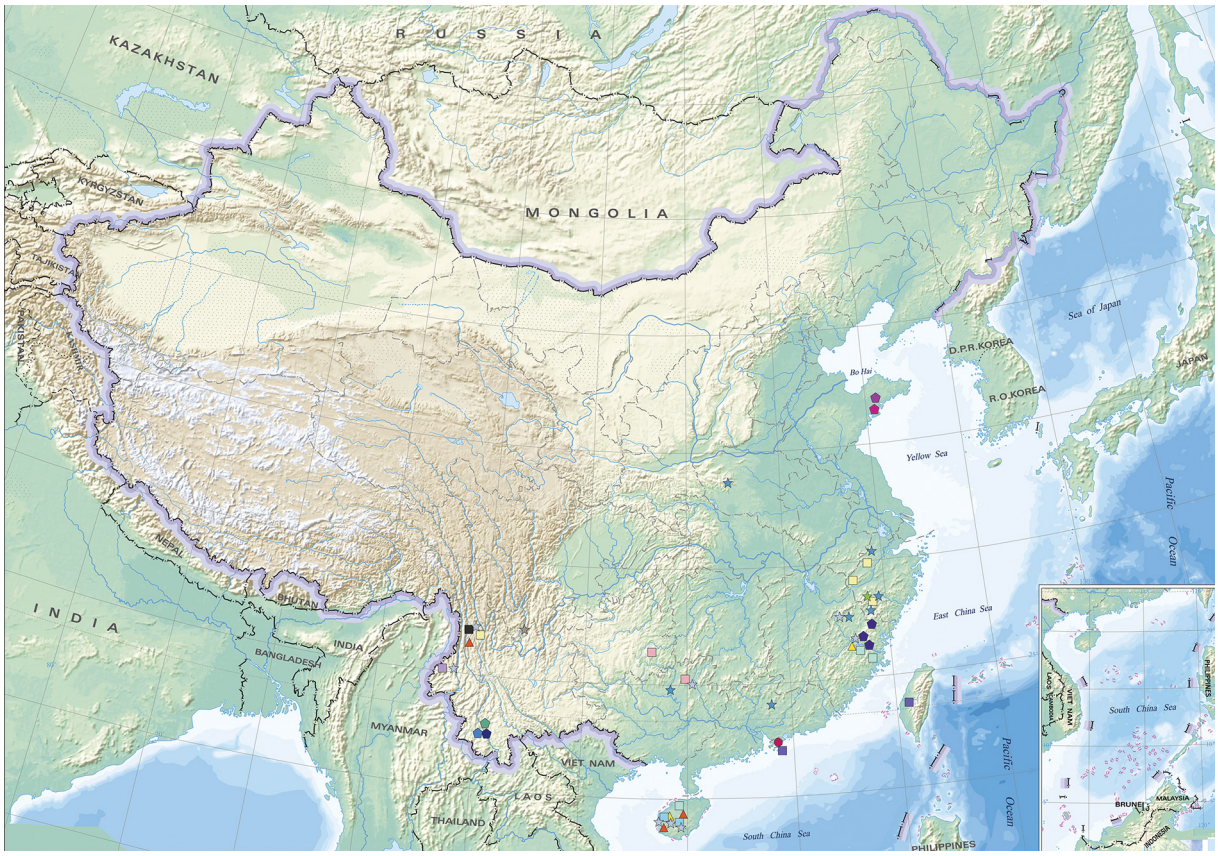
Discussion

Research on mesitiine species from China shows more variation of male genitalia within the genus

Male genitalia have commonly been used in generic diagnoses among Mesitiinae, especially the shape of the dorsal harpe and aedeagus, because they are usually identical within a genus. The genus *Sulcomesitius* used to be characterized by having the dorsal harpe S-shaped (Azevedo *et al*. 2018). However, our examination of the male genitalia of Chinese *Sulcomesitius* species indicates that the dorsal harpe is variable among species within this genus. For example, *S. breviculus* (Xu, He & Terayama, 2003) has a dorsal harpe of the genitalia that is 8-shaped. *Sulcomesitius* is not the only genus with two types of dorsal harpe. According to Barbosa *et al*. (2022), the genus *Incertosulcus* also has the dorsal harpe differently

shaped, i.e., club-shaped or filamentary. Therefore, variation in the shape of the dorsal harpe within the genus may be a common situation in Mesitiinae.

Males of *Incertosulcus* used to be characterized by having the aedeagus with a sickle process (Azevedo *et al.* 2018; Barbosa &Azevedo 2020; Barbosa *et al*. 2022). Two new species, *Incertosulcus afoveatus* sp. nov. and *I. exilisulcus* sp. nov., were found in our study and neither of them has the aedeagus with a sickle process, which makes the attribution of these two new species disputable. However, we still included them in *Incertosulcus* because both of them have long antennal setae (longer than the width of the flagellomere), the body foveolate but not as densely as in species in the genera *Heterocoelia* or *Sulcomesitius*, PPP present, and the hypopygium longer than wide with the posterior branches short. Therefore, an aedeagus with a sickle process is no longer a generic character shared by all the species of *Incertosulcus*. Until now, three types of genitalia have been found within this genus: aedeagus with sickle process and dorsal harpe filamentary (e.g., *I. pinotnoir* Barbosa & Azevedo, 2020, *I. sauvignon-blanc* Barbosa & Azevedo, 2020), aedeagus with sickle process and dorsal harpe club-shaped (e.g., *I. consimilis* (Móczár, 1970), *I. priesneri* (Móczár, 1978)) and aedeagus without sickle process and



- *H. curtisulcus* sp. nov.
- *H. punctulata* (Xu, He & Terayama, 2003)
- *H. unicolor* sp. nov.
- *I. afoveatus* sp. nov.
- *M. hongkongensis* Móczár, 1974
- *S. breviculus* (Xu, He & Terayama, 2003)
- *S. impressus* Xu, He & Terayama, 2003
- *S. sparsulus* sp. nov.
- *Z. acutulus* sp. nov.
- *Z. hamulosus* sp. nov.
- *H. neomoczari* (Barbosa & Azevedo, 2018)
- *H. remota* sp. nov.
- *H. varicolor* sp. nov.
- *I. exilisulcus* sp. nov.
- *S. angustifrons* sp. nov.
- *S. haemorrhoidalis* (Magretti, 1897)
- *S. latibilobatus* sp. nov.
- *S. zhaoi* (Xu & He, 2006)
- *Z. cambodianus* (Móczár, 1976)
- *Z. mahunkai* (Móczár, 1981)

Fig. 20. Distribution map of species of Mestiinae from China.

dorsal harpe filamentary (*I. afoveatus* sp. nov. and *I. exilisulcus* sp. nov.). This makes *Incertosulcus* the genus with the most variable male genitalia among Mesitiinae.

Considering the extensive variation of genitalia within the genera *Sulcomesitius* and *Incertosulcus*, the taxonomic value of a different shape of the dorsal harpe or aedeagus in the male genitalia for the identification of mesitiine genera may be vague, and further studies based both on more material and integrative data are necessary.

The distribution of the subfamily Mesitiinae in China

Mesitiinae species are rarely collected in China and mainly reported from the eastern provinces (Xu *et al.* 2003; Xu & He 2006). Our study indicates that Mesitiinae have a much wider distribution in China (Fig. 20) and the mesitiine species richness is higher in the Oriental part of China than in the Palaearctic part. However, considering the distribution of this subfamily in the Palaearctic Region outside China, additional collecting in Northwest China is needed to fill the huge gap which is possibly due to the poor investigation.

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