



First record of *Isegama* Krombein (Hymenoptera, Chrysididae, Amiseginae) from China, with description of a new species

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Abstract

The genus *Isegama* Krombein is recorded from China for the first time and one new species, *Isegama sinica* Li & Xu, **sp. nov.** (China: Guangxi, Hainan, Yunnan) is described and illustrated. Key to species of the genus is provided.

Key words. Amiseginae, *Isegama*, new species, key, Oriental, China

Introduction

The genus *Isegama* was erected in the subfamily Amiseginae by Krombein (1983) to accommodate the two new species, *I. meaculpa* Krombein, 1983 and *I. aridula* (Krombein, 1980) from Sri Lanka, with *I. meaculpa* as type species.

Similar to *Perissosega* Krombein, 1983, the species of *Isegama* also exhibit very little sexual dimorphism. Both sexes are fully winged, and the antennae are remarkably similar in morphology, being short and stout, tapering apicad, flagellomeres flattened on ventral surface (Krombein 1983). However *Isegama* can be separated from *Perissosega* by the following characteristics: mesopleuron with omaulus and scrobal sulcus (without omaulus and scrobal sulcus in *Perissosega*); forewing Rs extended by evenly curved dark streak (Rs extended at right angles by dark streak in *Perissosega*); metapectal-propodeal complex (sensu Kawada *et al.* 2015) rounded laterally and posteriorly (propodeal tooth long and acute in *Perissosega*) (Krombein 1983; Kimsey & Bohart 1991). The host of *Isegama* is still unknown (Kimsey & Bohart 1991).

Until now, three species of this genus, *I. meaculpa*, *I. aridula* and *I. malaysiana* Kimsey, 1986 were reported only from Oriental Region, Sri Lanka and Malaysia (Krombein 1983; Kimsey 1986), whereas no data was known from China (Kimsey & Bohart 1991). In the course of our survey on the Chinese Chrysididae fauna, one new species of *Isegama* is discovered and described herein.

Materials and methods

The specimens were examined and described under stereomicroscope Leica MZ125. Photographs were taken with a digital camera CoolSNAP attached to Zeiss stereomicroscope Stemi 2000-CS. Images were processed using Image-Pro Plus software.

Morphological terminology follows Krombein (1983) and Kimsey & Bohart (1991). Abbreviations used in the descriptions as follows: **F1, F2, F3, etc.** = flagellomeres 1, 2, 3, etc.; **MOD** = midocellus diameter; **MOL** = the shortest distance between midocellus and compound eye; **MS** = malar space, the shortest distance between base of mandible and lower margin of compound eye; **OOL** = the shortest distance between posterior ocellus and compound eye; **PD** = puncture diameter; **POL** = the shortest distance between posterior ocelli; **Rs** = Radial sector vein of forewing; **SD** = subantennal distance, the distance between a line drawn across lower edge of antennal sockets and clypeal apex; **T1, T2, ...** = 1st, 2nd, ... abdominal terga.

The holotype and paratypes of the new species are deposited in the Hymenopteran Collection of South China Agricultural University, Guangzhou (SCAU). The holotypes of *Isegama meaculpa* and *Cladobethylus aridulus* Krombein, 1980 which are deposited in the National Museum of Natural History, Smithsonian Institution, Washington DC, U.S.A. (NMNH) were used to compare in this study.

Genus *Isegama* Krombein, 1983

Isegama Krombein 1983: 23. Type species: *Isegama meaculpa* Krombein, 1983, by original designation.

Isegama: Kimsey 1986: 159; Kimsey & Bohart 1991: 115.

Diagnosis. Antenna filiform, with 11 flagellomeres; flagellum short, stout, tapered toward apex in both sexes, flattened on ventral side (Figs 1, 3); intermediate flagellomeres $0.8\text{--}0.9 \times$ as long as wide in females, and as long as wide in males; head punctate; vertex without impunctate median stripe (Figs 2, 4); scapal basin slightly to moderately concave, with close, short transverse rugulae; malar space with vertical sulcus (Figs 1, 3); occipital carina complete (Figs 2, 4); pronotum about as long as mesoscutum, punctate, with weak longitudinal median groove posteriorly (Figs 2, 4, 8) and pit before lateral lobe; mesoscutum punctate, with complete notauli, without parapsidal signum; notauli curved outward anteriorly and straight posteriorly (Figs 4, 8); mesopleuron with omaulus and long parallel-sided scrobal sulcus (Fig. 1); metanotum at least two-thirds as long as mesoscutellum, with distinct punctate median enclosure (Figs 4, 8); both sexes fully winged; forewing Rs extended by evenly curved dark streak (Fig. 7); metacoxa with dorso-basal carina; tarsal claw with a small erect tooth along inner margin; metapectal-propodeal complex rounded laterally and posteriorly; metasomal tergites and sternites punctuate (Krombein 1983; Kimsey & Bohart 1991).

Distribution. Oriental Region: China (new record), Sri Lanka, Malaysia (Krombein 1983; Kimsey & Bohart 1991).

Key to the species of female *Isegama*

1. Head, pronotum, mesoscutum, mesoscutellum and metanotum black, with blue metallic tints; vertex strongly convex in frontal view (Fig. 17 in Kimsey 1986); eyes bulging farthest below middle (Fig. 17 in Kimsey 1986); gena without genal carina; scape, pedicel and F1–F3 yellow, F4–F11 brown; legs entirely yellow *I. malaysiana* Kimsey
- Head, pronotum, mesoscutum, mesoscutellum and metanotum black, without metallic tints; vertex slightly convex in frontal view (Fig. 5); eyes bulging farthest above middle (Fig. 5); gena with (Figs 1, 3) or without genal carina; antenna with flagellomeres entirely blackish-brown to black; legs with at least coxae blackish-brown to black 2
2. Genal carina present (Figs 1, 3); median enclosure of metanotum with pair of anterior pits (Figs 4, 8); dorsal surface of metapectal-propodeal complex with pair of subcircular, polished and impunctate enclosures, enclosures about as wide as long (Fig. 9); head width $1.13 \times$ height in frontal view *I. sinica* sp. nov.
- Genal carina absent; median enclosure of metanotum with only single anterior pit; dorsal surface of metapectal-propodeal complex with pair of transverse, polished and impunctate enclosures, enclosures about two times as wide as long 3
3. Head width $1.22 \times$ height in frontal view; lower face with subocular surface more strongly converging (Fig. 7 in Krombein 1983); pronotum shorter than mesoscutum in median length *I. meaculpa* Krombein
- Head width $1.02 \times$ height in frontal view; lower face with subocular surface less strongly converging (Fig. 8 in Krombein 1983); pronotum as long as mesoscutum in median length *I. aridula* (Krombein)

Isegama sinica Li & Xu, sp. nov.

(Figs 1–10)

Material examined. Holotype: ♀, CHINA: Guangxi, Nanning, Shanglin, Longshan Nature Reserve (23°24'72"N, 108°31'91"E), 1–2.VII.2011, leg. Zaifu Xu (SCAU). Paratype: 1♂, CHINA: Guangxi, Nanning, Shanglin, Longshan Nature Reserve (23°24'72"N, 108°31'91"E), 1–2.VII.2011, leg. Zaifu Xu (SCAU); 2♀, CHINA: Hainan, Bawangling National Nature Reserve (19°7'31"N, 109°14'6"E), 7–11.VII.2006, leg. Jingxian Liu & Liqiong Weng (SCAU); CHINA: Yunnan, Gaoligongshan National Nature Reserve (25°50'23"N, 98°51'23"E), 16–17.VII.2006, leg. Jie Zeng, Juanjuan Ma & Bin Xiao (SCAU).



FIGURE 1. *Isegama sinica* sp. nov., ♀, holotype, habitus, lateral view.

Diagnosis. Body without metallic tints (Figs 4, 6, 8, 10); F1–F11 black with ventral side blackish-brown; head width $1.13 \times$ as height in frontal view (Fig. 5); vertex slightly convex (Fig. 5); gena with genal carina (Figs 1, 3); pronotum shorter than mesoscutum in median length; dorsal surface of metapectal-propodeal complex with pair of polished and impunctate enclosures about as long as wide (Figs 4, 8, 9).

Description. Holotype (Figs 1–7). *Female.* Body length 4.9 mm; forewing length 2.9 mm; MOL=2.0 MOD; MS=3.0 MOD; OOL=0.4 MOD; POL=2.0 MOD; SD=0.6 MOD; relative length of F1:F2:F3=10.0:5.0:6.0.

Head. Head width $1.13 \times$ as height in frontal view (Fig. 5); face and vertex polished with sparse and small punctures, 1.0–3.5 PD apart; vertex slightly convex (Fig. 5); ocellar triangle obtuse isosceles; eyes bulging and with short microtrichiae, not encircled by carina; scapal basin moderately concave, with polished median stripe and short transverse rugulae laterally; sides of lower face strongly converging; clypeus short, rounded apically; F1 $2.5 \times$ as long as wide; F2 $0.6 \times$ as long as wide; F3 $0.8 \times$ as long as wide; F11 $2.3 \times$ as long as wide.

Mesosoma. Relative ratio of median length of pronotum, mesoscutum, mesoscutellum and metanotum=5.5:7.0:3.0:3.0; pronotum slightly convex, polished with sparse and small punctures about 1.0–3.0 PD apart; mesoscutum polished with sparse and small punctures about 1.0–3.0 PD apart; mesopleuron with dense and large punctures about 0.5–1.0 PD apart on anterior two-third, with sparse and small punctures about 3.0–5.0 PD apart on posterior one-third; scrobal sulcus straight and parallel-sided; mesoscutellum polished with sparse and small punctures about 1.0–3.0 PD apart; metanotum polished with sparse and small punctures about 1.0–3.0 PD apart, median enclosure with pair of anterior pits; metapleuron polished with fine ridges below hind wing; metapectal-propodeal complex with strong transverse carina between dorsal surface and posterior surface; dorsal surface polished with pair of impunctate enclosure areas; posterior surface rugose with polished longitudinal median carina.

Metasoma. T1–T2 polished with dense and small punctures about 0.5–1.5 PD apart, with impunctate longitudinal median stripe (Fig. 6); T3–T4 polished with dense and small punctures about 0.5–1.5 PD apart.

Color. Head, mesosoma and metasoma black, without metallic tints; scape and pedicel reddish-brown;

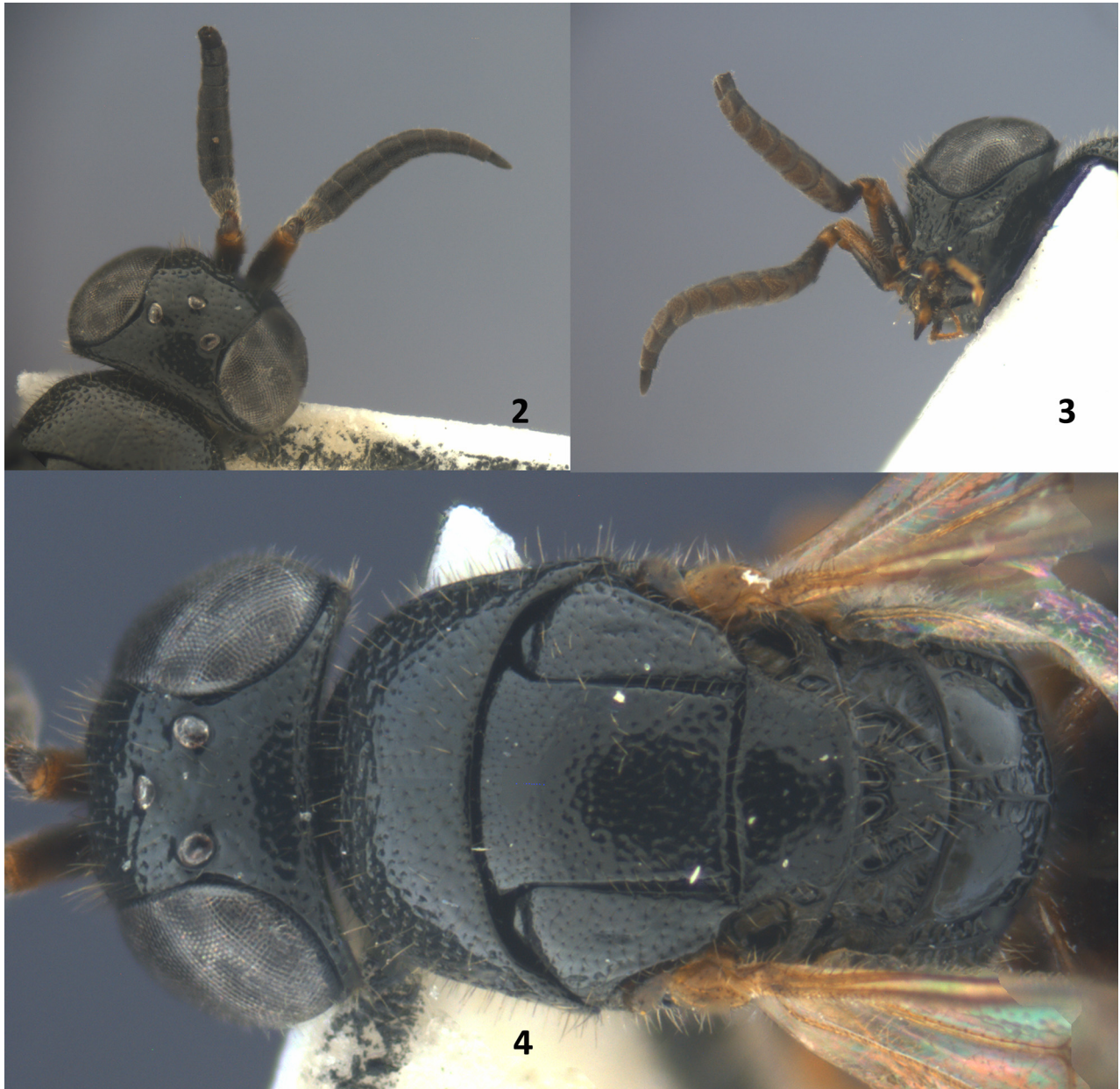
flagellomeres black with ventral side blackish-brown; mandible reddish-brown, apex dark brown; coxae dark brown, trochanters, tibiae and tarsi yellowish-brown, femora with outer surface dark brown and inner surface reddish-brown.

Variations. Female paratypes (Figs 8–10). Body length 4.8–5.0 mm; forewing length 2.8–3.0 mm.

Male. Body length 5.1 mm; forewing length 3.1 mm. Characteristics as in female except $MS=4.0$ MOD, $SD=1.0$ MOD, relative ratio of median length of pronotum, mesoscutum, mesoscutellum and metanotum=6:7:3:3.

Distribution. Oriental part of China (Guangxi, Hainan, Yunnan).

Etymology. The new species name is referred to the type locality, China.



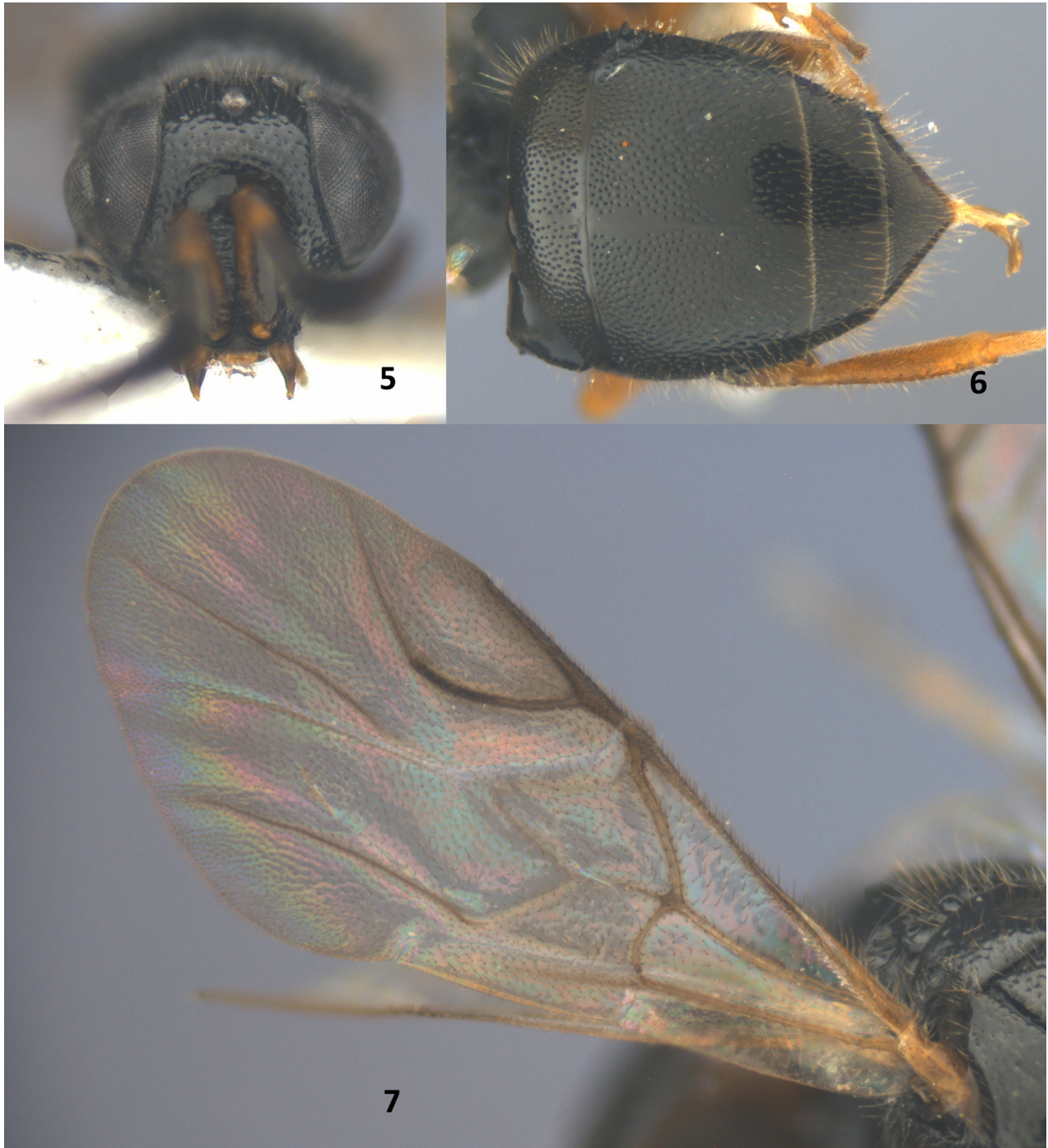
FIGURES 2–4. *Isegama sinica* sp. nov., ♀, holotype. 2. Antennae, head and pronotum, dorsal view; 3. Antennae, ventral view; 4. Head and mesosoma, dorsal view.

Discussion

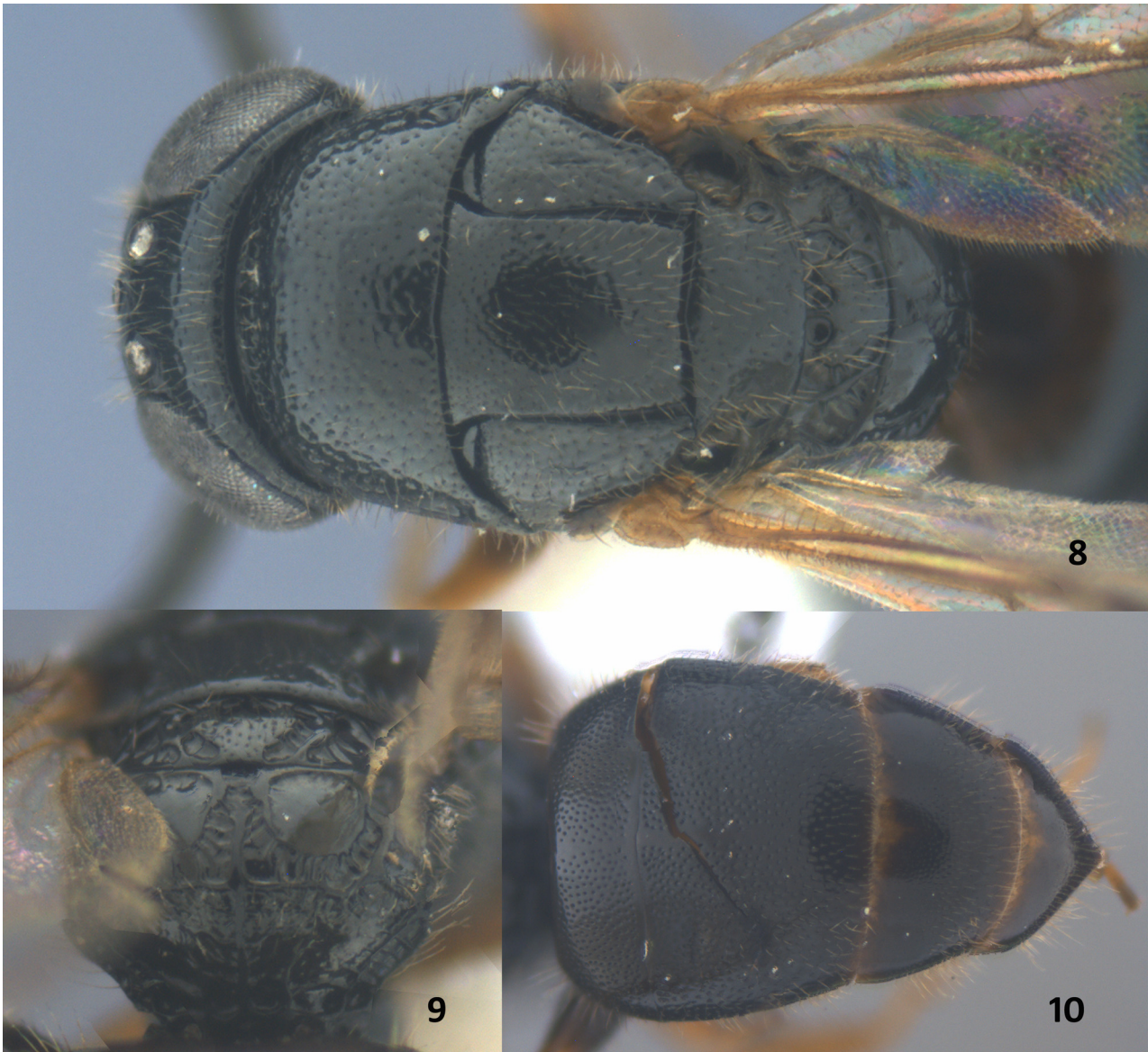
Kimsey & Bohart (1991) stated that the genus *Isegama* without dorso-basal carina on metacoxa and without occipital carina on head in key to the genera of Amiseginae (p.82), but with dorso-basal carina and occipital carina

in the generic diagnosis of *Isegama* (p.115). Actually, both dorso-basal carina and occipital carina present in the four known species as described in the generic diagnosis of this genus by Kimsey & Bohart (1991).

Although Kimsey & Bohart (1991) stated the distinctions of *I. meaculpa*, *I. aridula* and *I. malaysiana* are based on head dimensions, colour, and thoracic sculpturing. Besides above characteristics listed in the key, *Isegama sinica* **sp. nov.** can be easily distinguished from the above three described *Isegama* species by genal carina present (genal carina absent in above three described species), median enclosure of metanotum with pair of anterior pits (with only single anterior pit in above three described species).



FIGURES 5–7. *Isegama sinica* **sp. nov.**, ♀, holotype. 5. Head, frontal view; 6. Metasoma, dorsal view; 7. Forewing.



FIGURES 8–10. *Isegama sinica* sp. nov., ♀, paratype from Hainan. 8. Head and mesosoma, dorsal view; 9. Metanotum and metapetal-propodeal complex, postero-dorsal view; 10. Metasoma, dorsal view.

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References

- Krombein, K.V. (1980) *Biosystematic Studies of Ceylonese Wasps, I: A preliminary Revision of the Amiseginae (Hymenoptera: Chrysididae)*. P.E.P. Deraniyagala Commemoration Volume (Sri Lanka 1980), 1–392.
- Kawada, R., Lanes, G.O. & Azevedo, C.O. (2015) Evolution of metapostnotum in flat wasps (Hymenoptera, Bethyloidea):

implications for homology assessments in Chrysidoidea. *PLoS ONE*, 10 (10), e0140051.

<http://dx.doi.org/10.1371/journal.pone.0140051>

Krombein, K.V. (1983) Biosystematic Studies of Ceylonese Wasps, XI: A monograph of the Amiseginae and Loboscelidiinae (Hymenoptera: Chrysididae). *Smithsonian Contributions to Zoology*, 376, 1–79.

<http://dx.doi.org/10.5479/si.00810282.376>

Kimsey, L.S. (1986) New species and genera of Amiseginae from Asia (Chrysididae, Hymenoptera). *Psyche*, 93, 153–165.

<http://dx.doi.org/10.1155/1986/31631>

Kimsey, L.S. & Bohart, R.M. (1991 [1990]) *The Chrysidid Wasps of the World*. Oxford University Press, New York, I–IX + 652 pp.