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Two new species of *Heteropterna* Skuse, 1888 (Diptera: Keroplatidae) from China

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Abstract

Two new species of *Heteroptera* (Diptera: Keroplatidae: Keroplatinae), *H. cuneata* **sp. n.** and *H. fanjingshana* **sp. n.** are described from Guizhou, China. Key to adult males of *Heteropterna* from China is given. Habitus images of adults and morphological structures are provided.

Key words: *Heteropterna,* Keroplatidae, new species, Guizhou, taxonomy

Introduction

The family Keroplatidae currently includes more than 1000 species in 7 subfamilies (Mantič *et al.* 2020, Ševčík *et al.* 2020). The genus *Heteropterna* was established by Skuse (1888) for the type species *H. macleayi* Skuse, 1888 from Australia, which was originally placed in Ceroplatinae (= Keroplatinae) of Mycetophilidae. Its systematic position had not been changed until Matile (1981) classified the genus into the tribe Keroplatini (Keroplatidae: Keroplatinae), which was adopted by the later researchers (e.g. Matile 1990; Papp *et al.* 2006; Mederos 2018). The most recent key to the World genera of Keroplatini was published by Ševčík *et al.* (2015).

Heteropterna is now divided into two subgenera: *Heteropterna* sensu stricto and the monotypic *Scrobicula* (Matile 1970). Currently this genus consists of 32 species worldwide, including four species of *Ctenoceridion* Matile, 1972, a junior synonym of *Heterpterna*, according to Mantič *et al.* (2020). Most of them were recorded from the Neotropical (11), Australian (9) and Oriental (6) regions, with only a few species reported in the other regions: Afrotropical (3), Palearctic (2), Nearctic (1) (Evenhuis 2006; Papp *et al.* 2006; Mederos 2018). Prior to this study, there was only one species, i.e., *H. septemtrionalis* (Okada), reported from China (Zhejiang Province) (Xu *et al.* 2007), which was originally described in Japan (Okada 1938).

This paper aims to report two new species of *Heteropterna* in China. A key to all the involved species in China is provided based on the male adults.

Materials and methods

All of the specimens were collected by Malaise trap in the subtropical forest of Guizhou Province, southern China (Oriental Region), and preserved in 85% ethanol and stored in 4°C for morphological and molecular analyses. Cleared exoskeleton of head and thorax were mounted in Euparal® on microscopic slides. Photographs of adult specimens and slide specimens were taken with a KEYENCE VHX digital microscope equipped with the VHX-6000 computer and VH-Z100R microscopic lens, and refined in Photoshop CS6 software. The body color is described based on the specimen preserved in ethanol. Morphological abbreviations and terminology follow those in

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Matile (1990) and Blagoderov & Ševčík (2017). Type specimens were deposited at the Institute of Forest Protection, Zhejiang A&F University, Hangzhou, Zhejiang province, China [ZAFU].

Taxonomy

Heteropterna Skuse, 1888

Heteroptera Skuse, 1888. Linn. Soc. New South Wales, Proc. 3: 166; Edwards, 1929. Linn. Soc. New South Wales, Proc. 54: 174. Type species: *Heteropterna macleayi* Skuse, 1888, by monotypy.

Key to the species of *Heteropterna* in China (based on male adults)

1 Antenna with flagellomeres 11–14 yellowish white 2
- Antenna with flagellomere 11 mainly brown, flagellomeres 12–14 yellowish white, mesonotum with a cuneiform medial streak . . . . . *H. cuneata* **sp. n.**
2 Medial hyaline wing spot with posterior side curving toward wing tip, mesonotum with a band-like medial stripe, internal lobe of gonostylus apically straight in ventral view . . . . . *H. fanjingshana* **sp. n.**
- Medial hyaline wing spot with posterior end curving toward base of wing, mesonotum with a cuneiform medial stripe, internal lobe of gonostylus apically hooked in ventral view . . . . . *H. septemtrionalis* (Okada)

Heteropterna (*Heteropterna* s. str.) *cuneata* Wang *et* Huang sp. n.

(Figs 1–2)

Diagnosis. This new species resembles *H. annulipes* (Colless) in appearance by having similar wing pattern, but can be recognized by the cercus tapering to the apex, the external lobe of gonostylus apically rounded in ventral view, and the gonocoxites with posterior 1/5 split into halves in the terminalia (Figs 2i–k). In *H. annulipes*, the cercus is reniform, the external lobe of gonostylus has a pointed end in ventral view, and the gonocoxites are fused posteriorly in the terminalia (Colless 1966: Figs 1a–c).

Type material. Holotype. Male, CHINA: Guizhou Province, Mt. Fanjing (27.8° N, 108.62° E), 750 m, 5.VI–4.VII.2020, coll. Fanliang Liu, slide no. FJS-11-20.

Description. Male (Fig. 1)**.** Body length (without antennae) 5.5 mm. Wing length 3.2 mm. Length of terminalia 0.56 mm.

Head dark brown. Compound eyes (Fig. 2a) hemispheric, occupying most area of head, bearing dense pubescence on surface. Three ocelli (Fig. 2b) lying between upper edges of eyes, arranged in an inverted triangle, with lateral ones about three times of median one in diameter. Mouthparts (Fig. 2a) reduced, palpus two-segmented and porrect, labrum subtriangular, labellum has bushy setae outside. Antenna (Fig. 2c) pectinate and laterally compressed, slightly longer than head width; scape and pedicel subtrapezoid, covered with dense microtrichia laterally, having setae in different length dorsally and ventrally; flagellum 14-segmented and comb-like, bearing dense microtrichia laterally, with a few setae dorsally and ventrally; flagellomeres 1–11 brown (except 7th and 11th segment partly yellowish white), flagellomeres 12–14 yellowish white, with last one somewhat dark apically.

Thorax (Figs 2d–f) brown. Prothoracic spiracle membranous, elliptical. Anepisternum dark brown and subtriangular, with sparse setae. Mesonotum brown, middle streak dark brown and cuneiform, with yellowish brown stripes along lateral sides. Scutellum fuscous, subrectangular. Mediotergite yellowish brown and subtriangular, with medial membranous area inverted triangular. Laterotergite fuscous brown, suboval. Halter length 0.38 mm; stem translucent, with setae anteriorly; knob dark brown, with sparse setae anteriorly.

Wing (Fig. 2g) pale brown, having dense microtrichia on surface, outer and posterior margin with short cilia. Fuscous stripe along costal margin, about 1/4 width of wing, extending from base to end of costa. Hyaline spots irregular, with a smaller medial spot from end of Sc obliquely outward to above middle of R, and a larger apical spot from end of R_{2+3} obliquely outward to above bottom margin of stripe. Veins brown to dark brown, with two rows of microsetae on C, and a row of microsetae on R_1 and R_{4+5}. Vein C stops at 5/12 of R_{4+5}-M_1. M_1 and M_2 weaker than

other veins, with M_1 ending at outer margin and M_2 ending far from outer margin. CuA curved backward at middle. False vein close to CuA, with free end. Vein r-m degenerated and weakly sclerotized.

Legs (Fig. 1) yellowish white to dark brown. Coxae dark brown, covered with setae densely. Femora yellowish brown, scattered with setae. Tibiae and tarsi light brown, bearing thick microtrichia.

FIGURE 1. Male adult of *Heteropterna* (*Heteropterna*) *cuneata* **sp. n.**, holotype, dorsolateral view.

Abdomen (Fig. 2h) brown, covered with dense setae. Tergites light brown. Sternites dark brown, with paired subelliptical hyaline spots on sternites 2 to 4.

Terminalia (Figs 2i–k) brown. Tergite 9 subtrapezoidal, concave both anteriorly and posteriorly, covered with setae densely. Cercus setose dorsally, wide basally, tapering to posterior end, with distal half slightly curved inward. Gonocoxites ventrally with anterior 4/5 fused, posterior 1/5 spilt into halves; posterior protuberance subtriangular, with stout setae ventrally. In ventral view external lobe of gonostylus thinly digitate, rounded terminally, slightly shorter than width of gonocoxite, having dense long bristles laterally; internal lobe of gonostylus corniform, about 2/3 length of external lobe, with short setae inside and long bristles outside. In lateral view dorsal lobe of gonostylus subtriangular, covered with dense setae.

Female. Unknown.

Etymology. The name of this species is from the Latin *cuneatus* (cuneiform), in reference to the cuneiform streak at middle of mesonotum; adjective in genitive case.

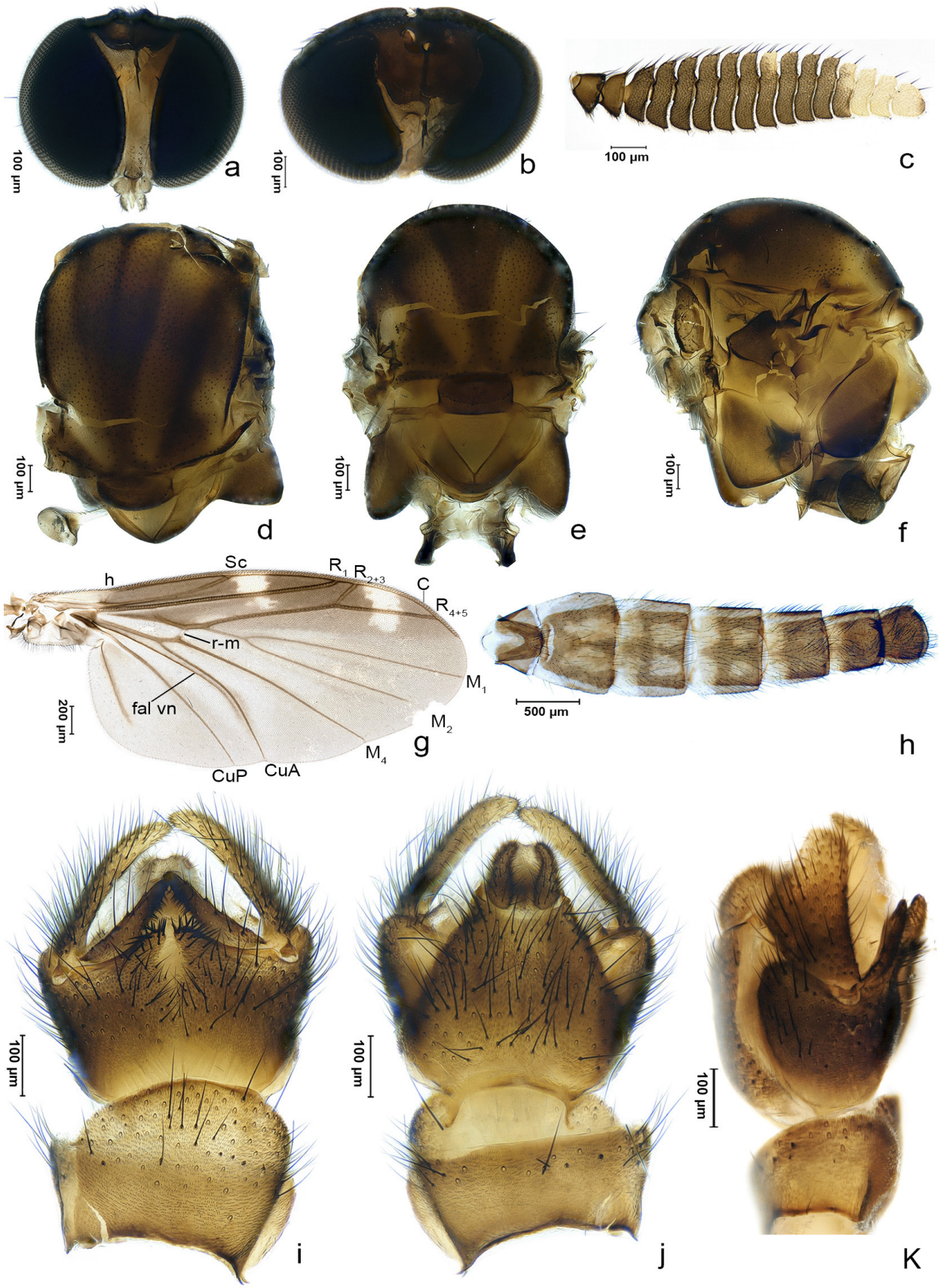

FIGURE 2. *Heteropterna* (*Heteropterna*) *cuneata* **sp. n.,** holotype. a–b, head (a, frontal view; b, dorsal view), antennae removed; c, antenna; d–f, thorax (d, dorsal view; e, posterior view; f, lateral view); g, wing; h, ventral view of abdomen; i–k, terminalia (i, ventral view; j, dorsal view; k, lateral view). Slide No. FJS-11-20.

***Heteropterna* (*Heteropterna* s. str.) *fanjingshana* Wang *et* Huang sp. n.**
(Figs 3–4)

Diagnosis. This new species is similar to *H. septemtrionalis* (Okada) by having similar antennae with the last four flagellomeres yellowish white. It can be recognized by the wing having medial hyaline spot oblique outward, and the internal lobe of gonostylus apically straight in ventral view (Figs 4g, i–k). In *H. septemtrionalis*, the wing has a medial hyaline spot oblique inward, and the internal lobe of gonostylus apically hooked in ventral view (Matile, 1990: Figs 586–587).

Type material. Holotype. Male, CHINA: Guizhou Province, Mt. Fanjing (27.95° N, 108.77° E), 840 m, 5.VI.2020, coll. Zhenghai Yang, slide no. FJS-10-28.

Description. Male (Fig. 3)**.** Body length (without antennae) 5.3 mm. Wing length 3.4 mm. Length of terminalia 0.5 mm.

FIGURE 3. Male adult of *Heteropterna* (*Heteropterna*) *fanjingshana* **sp. n.**, holotype, lateral view.

Head (Figs 4a–b) dark brown. Compound eyes (Fig. 4a) hemispheric, making up most area of head, covered with dense pubescence superficially. Three ocelli (Fig. 4b) lying between upper edges of eyes, arranged in an inverted triangle, with median ocellus at a slightly lower position, lateral ocelli about three times as median one in diameter. Mouthparts (Fig. 4a) reduced, palpus two-segmented and setose, labrum ligulate, labellum has bushy setae laterally. Antenna (Fig. 4c) pectinate and laterally compressed, about 1.5 times length of head width; scape and pedicel subtrapezoid, with setae dorsally and ventrally; flagellum 14-segmented and comb-like, covered with serried microtrichia laterally, with countable setae dorsally and ventrally; flagellomeres 1–10 brown (except 7th segment yellowish white laterally), flagellomeres 11–14 yellowish white, with last segment pale brown terminally.

Thorax (Figs 4d–f) brown. Anepisternum dark brown and subtriangular, bare. Mesonotum brown; medial stripe dark brown, narrowly bandlike, reaching to posterior 2/5. Scutellum dark brown, subrectangular. Mediotergite yellowish brown and subtriangular, medial membrane inverted triangular. Laterotergite brown and subelliptical. Halter length 0.5 mm; stem translucent, with distal half bearing setae anteriorly; knob dark brown, oval.

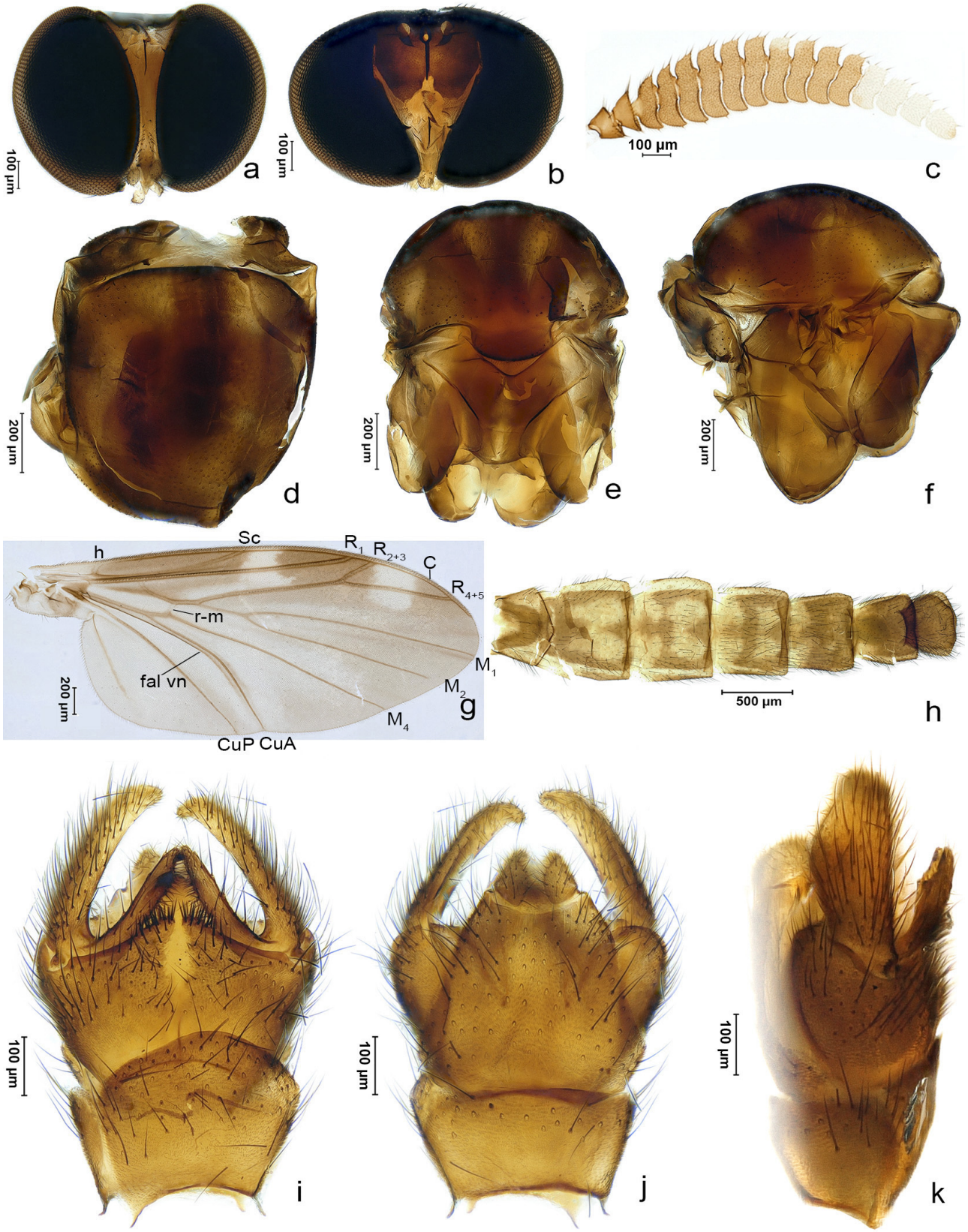

FIGURE 4. *Heteropterna* (*Heteropterna*) *fanjingshana* **sp. n.,** holotype. a–b, head (a, frontal view; b, dorsal view), antennae removed; c, antenna; d–f, thorax (d, dorsal view; e, posterior view; f, lateral view); g, wing; h, ventral view of abdomen; i–k, terminalia (i, ventral view; j, dorsal view; k, lateral view). Slide No. FJS-10-28.

Wing (Fig. 4g) pale brown, covered with thick microtrichia superficially, outer and posterior margin with short cilia. Fuscous stripe along costa, approaching to 2/7 width of wing, stretching from base to end of costa. Medial hyaline spot irregular extending from end of Sc outward to middle of R, apical hyaline spot extending from end of R_{2+3} obliquely inward to bottom margin of stripe. Veins brown to dark brown, with two rows of microsetae on C, and a row of microsetae on R_1, R_{2+3} and R_{4+5}. Vein C terminate at 2/5 of R_{4+5}-M_1. M_1 and M_2 weaker than other veins, with M_1 ending at outer margin, and M_2 ending far from outer margin. CuA curved backward at midpoint. False vein next to CuA, with free end. Vein r-m degenerated.

Legs (Fig. 3) yellowish white to dark brown. Hind leg dark brown, except femora yellowish white interiorly, with thick setae. Fore and mid legs damaged, only with fuscous coxae left.

Abdomen (Fig. 4h) brown, with dense setae dorso-ventrally. Tergites pale brown. Sternites dark brown, with paired suboval hyaline spots from sternites 2 to 4 on each segment.

Terminalia (Figs 4i–k) brown. Tergite 9 subtrapezoidal, shallowly concave at posterior margin. Cercus subtriangular, setose dorsally. Gonocoxites with posterior 1/3 weakly sclerotized along median line; posterior protuberance horn-shaped, covered with intensive setae ventrally. In ventral view external lobe of gonostylus finely digitate, obtuse terminally, slightly shorter than width of gonocoxite, with dense bristles outside; internal lobe of gonostylus horn-like, about 2/3 length of external lobe, with setae inside and long bristles outside. In lateral view dorsal lobe of gonostylus enlarged dorsad at middle, with thick setae superficially.

Female. Unknown.

Etymology. This species is named after Mt. Fanjing, the collection site of type specimen; noun in genitive case.

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