



Six new species of the subgenus *Homoneura* (Diptera: Lauxaniidae: *Homoneura*) from Yintiaoling Nature Reserve, Chongqing, China



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Abstract

The subgenus *Homoneura* (*Homoneura*) is nearly cosmopolitan, with more than 700 described species distributed in all zoogeographical regions, except the Neotropical region. Here, we describe six new species of the subgenus from Yintiaoling Nature Reserve, Chongqing, China: *Homoneura* (*Homoneura*) *mediclavata* **sp. nov.** in the *H. (H.) abnormis* group; *H. (H.) claviformis* **sp. nov.** in the *H. (H.) laticosta* group; *H. (H.) nigrapicalis* **sp. nov.** and *H. (H.) longicerca* **sp. nov.** in the *H. (H.) notostigma* group; *H. (H.) caperata* **sp. nov.** and *H. (H.) fuscifemoris* **sp. nov.** not placed in any species group. Detailed descriptions and diagnosis of each species are provided.

Key words: Homoneurinae, *Homoneura*, new species, Chongqing, Yintiaoling

Introduction

The genus *Homoneura* Wulp, 1891 belongs to the subfamily Homoneurinae. It is the largest genus in the family Lauxaniidae, with 8 subgenera and more than 700 species in the world (You *et al.*, 2023), with more than 250 described species occurring in China.

Homoneura sensu stricto is a nearly cosmopolitan subgenus of the genus *Homoneura*, which is highly diversified in China, currently with 225 described species (You *et al.*, 2023). It can be separated from other subgenera by follow characters: Mesonotum with 0+3 dorsocentral setae, anteriormost dorsocentral seta behind transverse scutal suture; 0 supraalar seta, 0 intraalar bristle. Mid tibia 0 posterior seta.

Yintiaoling National Nature Reserve is located in the northeast of Wuxi County, Chongqing China. It has high value in biodiversity protection, scientific research, popular science education, ecotourism, and other aspects. The adults and larvae of lauxaniids are mainly saprophagous (Miller, 1977). The rich humus and fungi in Yintiaoling Reserve are particularly suitable for the breeding and habitat of lauxaniids. Four species of *Homoneura* had been described from the Yintiaoling National Nature Reserve (You *et al.*, 2023).

In this paper, we report six new species of the subgenus *Homoneura* from Chongqing, southwestern China, namely *H. (H.) caperata* **sp. nov.**, *H. (H.) claviformis* **sp. nov.**, *H. (H.) fuscifemoris* **sp. nov.**, *H. (H.) mediclavata* **sp. nov.**, *H. (H.) longicerca* **sp. nov.** and *H. (H.) nigrapicalis* **sp. nov.** Among them, *H. (H.) mediclavata* **sp. nov.** belongs to *H. (H.) abnormis* group, *H. (H.) claviformis* **sp. nov.** belongs to *H. (H.) laticosta* group, *H. (H.) longicerca* **sp. nov.** and *H. (H.) nigrapicalis* **sp. nov.** belong to *H. (H.) notostigma* group, and *H. (H.) caperata* **sp. nov.** and *H. (H.) fuscifemoris* **sp. nov.** are unplaced species. As is typical for *Homoneura*, the male genitalia are of particular importance for species identification.

Material and methods

General terminology follows Cumming & Wood (2017) and Gaimari & Miller (2021). Genitalia preparations were made by removing and macerating the apical portion of the abdomen in pancreatin for six hours (Álvarez-Padilla & Hormiga 2007), then rinsing them with distilled water for dissection and study. After examination in glycerin, they were transferred to an ethanol tube together with the wet specimens. Specimens examined were deposited in the Henan University of Science and Technology, Luoyang, Henan, China (HAUST).

Taxonomy

Key to three species groups and unplaced species in China

(modified from Shi & Yang 2014)

1. Head and mesonotum mostly black *H. (H.) fuscifemoris* **sp. nov.**
- Head and mesonotum mostly pale yellow to brownish yellow 2
2. Wing hyaline without brown spot, antennal 1st flagellomere deeply dark on apical 1/2. *H. (H.) notostigmata* group
- Wing hyaline or pale yellow with brown spots, antennal not as above 3
3. Wing with broad deep brown area extending from costal margin to R_{4+5} or M_1 , faded gradually from costal margin to central area *H. (H.) laticosta* group
- Wing mostly hyaline or pale yellow with brown round or elliptical spots or short stripe-like spots 4
4. Wing with a brown spot at tip of Sc and R_1 *H. (H.) caperata* **sp. nov.**
- Wing without brown spot at tip of Sc and R_1 *H. (H.) abnormis* group

Homoneura (Homoneura) abnormis group

Key to species of *Homoneura (Homoneura) abnormis* group in China

(modified from Shi & Yang 2014)

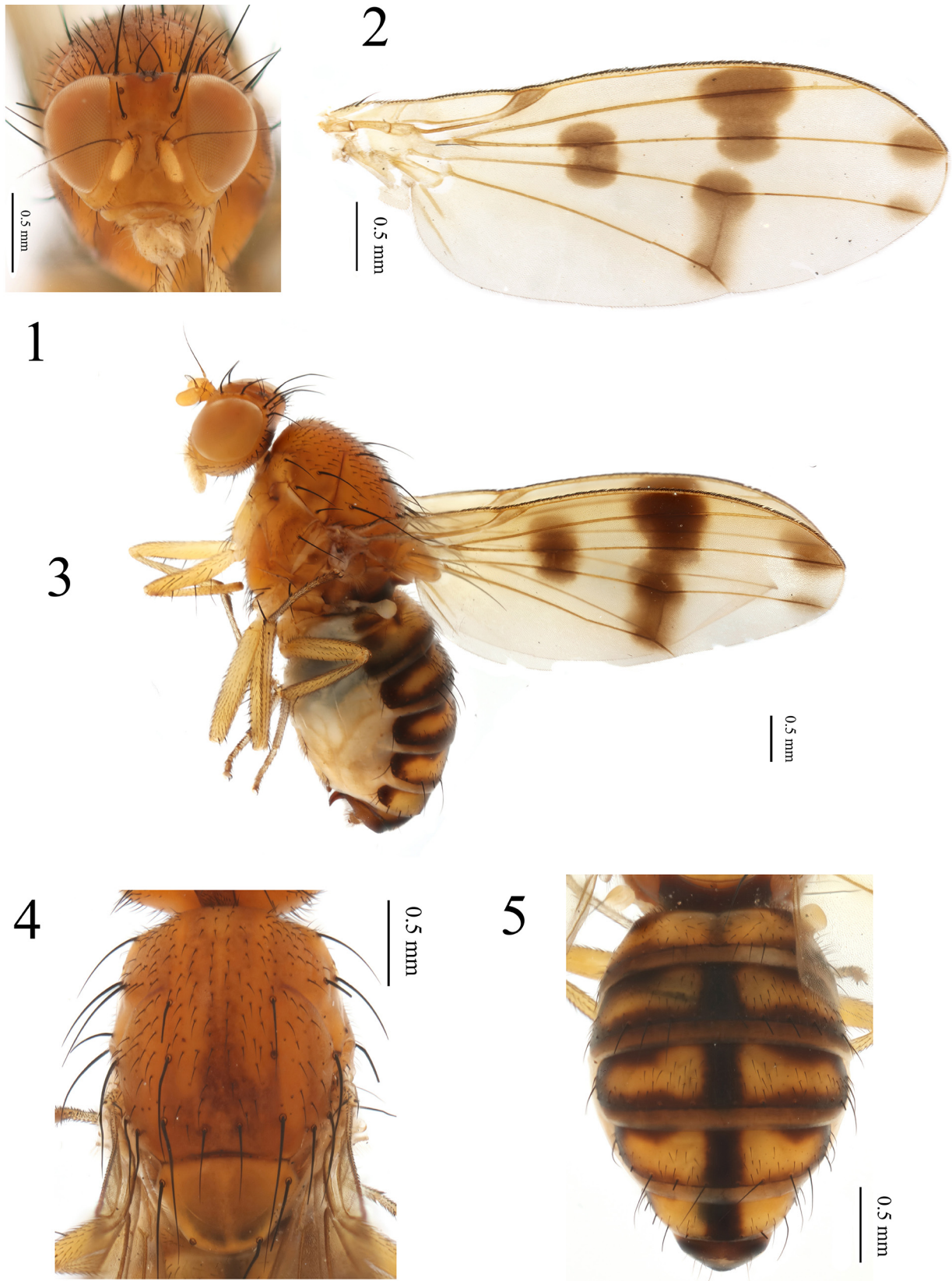
1. A brown subapical spot on R_{2+3} and medial spot on R_{4+5} behind the vertical level of dm-cu. 2
- A brown subapical spot on R_{2+3} and medial spot on R_{4+5} at the same vertical level of dm-cu. 3
2. Mesonotum with acrostichal setae in 6 rows; surstylus with a narrow curved apical process in lateral view (see Gao & Yang, 2004: figs 25–30) *H. (H.) jiangi* Gao & Yang
- Mesonotum with acrostichal setae in 8 rows; surstylus with apical process slender, with dorsal setulae, and subapical process slender, blunt apically (see Sasakawa, 2001: fig. 29) *H. (H.) vietnamensis* Sasakawa
3. Apical spots on R_{4+5} and M_1 separated entirely 4
- Apical spots on R_{4+5} and M_1 confluent or slightly separated 5
4. Fore femur with four posterior dorsal setae and three posterior ventral setae; mid femur with six anterior setae; surstylus consisting of an apical process and a small teeth-like process in lateral view (see Gao & Yang, 2004: figs 1–6) *H. (H.) abnormis* Gao & Yang
- Fore femur with six posterior dorsal setae and four posterior ventral setae; mid femur with five anterior setae; surstylus with a curved process in lateral view (Figs 3, 6–7) *H. (H.) mediclavata* **sp. nov.**
5. Antenna yellow, 1st flagellomere brown on apical 2/3; abdominal tergite 6 without black round spots near ventrolateral margin; syntergosternite with dorsal setulae and three setulae around spiracle; hypandrium with four hypandrial processes (see Shi & Yang, 2014: figs 14, 158–162) *H. (H.) longifurcata* Shi & Yang
- Antenna yellow, 1st flagellomere pale brown on apical 2/3; abdominal tergite 6 with a pair of black round spots near ventrolateral margin; syntergosternite without dorsal setulae and a setula around spiracle; hypandrium with three hypandrial processes (see Shi & Yang, 2014: figs 22, 310–314) *H. (H.) triprocessa* Shi & Yang

Homoneura (Homoneura) mediclavata **sp. nov.**

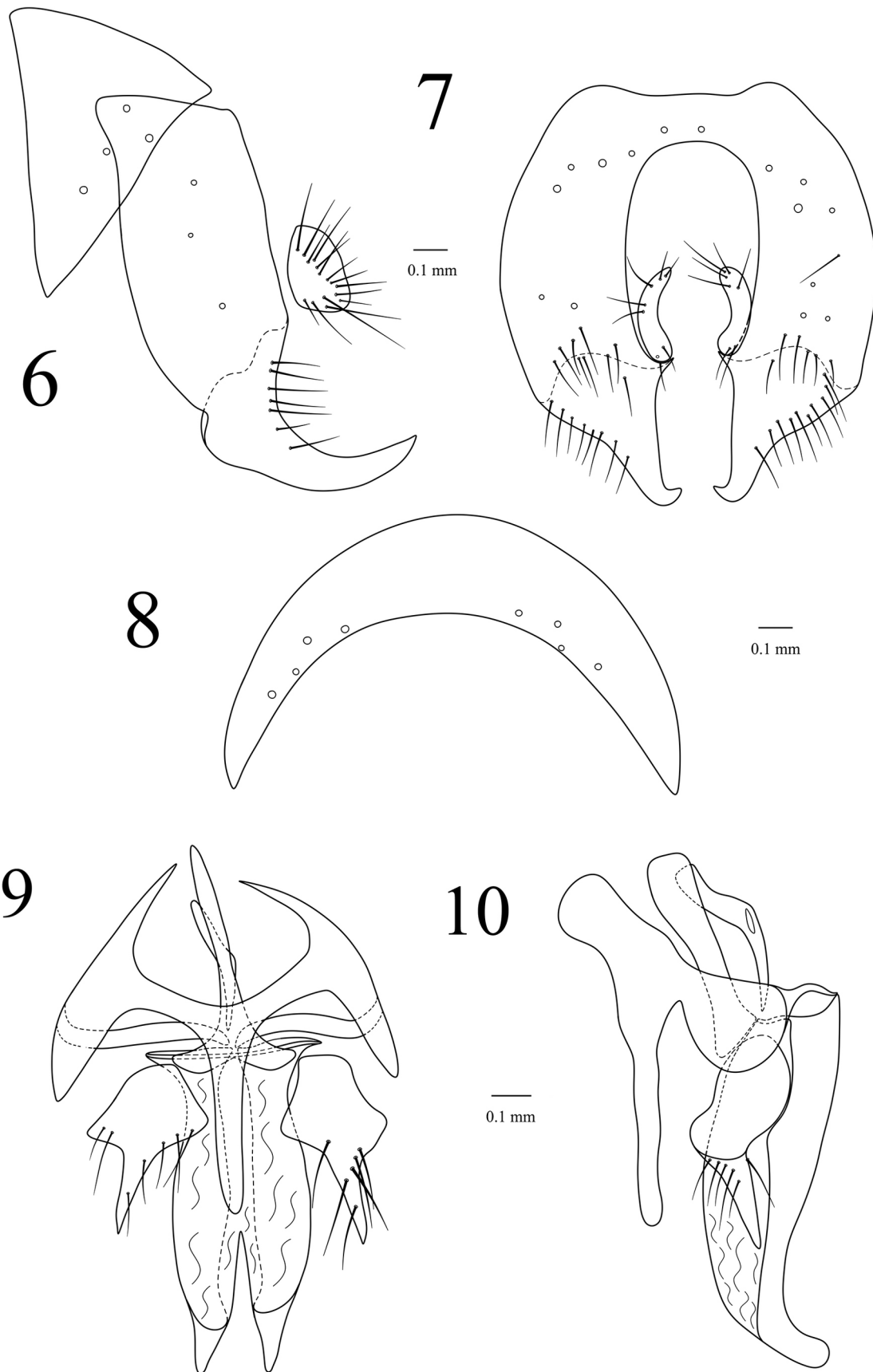
(Figs 1–10)

Type material. Holotype ♂, China, **Chongqing**: Wuxi County, Yintiaoling Nature Reserve, Lanying Town, Qingcaoping (1843 m), 2022. VIII. 15, leg. Xulong Chen [31°24'35"N, 109°53'07"E]. **Paratypes**: 4♂2♀, same data as holotype; 1♀, Yintiaoling Nature Reserve, Linkouzi Management and Protection Station to Guimenguan (1349 m), 2022. VIII. 11, leg. Xulong Chen [31°28'36"N, 109°53'19"E]; 1♂3♀, Yintiaoling Nature Reserve,

Huangcaoping (2104 m), 2022. VI. 30, leg. Xulong Chen [31°25'10"N, 109°55'43"E]; 1♂1♀, China, **Sichuan**, Ganzi Prefecture, Muli County, Ker Township, Songjiagou Village (2449 m), 2020. VIII. 26, leg. Wenliang Li [28°3'36"N, 101°1'48"E]; 1♂, China, **Hubei**, Shennongjia Nature Reserve, Guanmenshan, (1530 m), 2019. VIII. 13, leg. Ding Yang.



FIGURES 1–5. *Homoneura (Homoneura) mediclavata* **sp. nov.** Male. 1. head, anterior view; 2. wing; 3. habitus, lateral view; 4. thorax, dorsal view; 5. abdomen, dorsal view.



FIGURES 6–10. *Homoneura (Homoneura) mediclavata* **sp. nov.** Male. 6. syntergosternite 7+8 and epandrial complex, lateral view; 7. epandrial complex, posterior view; 8. syntergosternite 7+8, anterior view; 9. phallic complex, ventral view; 10. phallic complex, lateral view.

Etymology. Latin, *mediclavata*, referring to the club-shaped median ventral process of the hypandrium. A feminine adjective.

Diagnosis. Thorax with a wide brown stripe extending from level of anteriormost dorsocentral seta to apex of scutellum, with wide brown stripe bifurcating anteriorly to anteriormost dorsocentral seta and extending to anterior edge; hypandrium H-shaped and with a claviform ventral process at middle; phallus recurved in lateral view and finger-like apically, bifurcated distally in dorsal view.

Description. MALE. Body length 4.5 mm, wing length 5.0 mm. FEMALE. Body length 4.0 mm, wing length 4.5 mm.

Head (Fig. 1) yellow. Frons as long as wide and parallel-sided, with a pair of pale brown stripes extending to sides of ocellar triangle; ocellar triangle black, ocellar seta pubescent, shorter than 1/2 long of anterior fronto-orbital seta, anterior fronto-orbital seta shorter than posterior fronto-orbital seta. Gena about 1/8 height of eye. Antenna yellow, first flagellomere about 1.3 times longer than high; arista blackish brown except yellow at base, pubescent, with longest ray shorter than 1/6 height of first flagellomere. Prementum and labellum yellow, with pale yellowish and blackish setulae; palpus yellow with black setulae.

Thorax (Fig. 4) brownish yellow, with greyish white pruinosity; mesonotum with a wide brown stripe extending from level of anteriormost dorsocentral seta to apex of scutellum, with wide brown stripe bifurcating anteriorly to anteriormost dorsocentral seta and extending to anterior edge; 0+3 dorsocentral setae, anteriormost dorsocentral seta behind transverse scutal suture; acrostichal setulae in six rows; prescutellar setae present; katapisternum with one strong seta and one weak seta. Legs yellow, with apical segments of fore tarsus darker. Fore femur with six posterior dorsal setae, four posterior ventral setae and ctenidium with ten short setae; fore tibia with one long dorsal preapical seta and one short apical ventral seta. Mid femur with five anterior setae and one short apical posterior seta; mid tibia with one strong dorsal preapical seta and three strong apical ventral setae. Hind femur with one preapical anterior dorsal seta; hind tibia with one weak dorsal preapical seta and one short apical ventral seta. Wing (Fig. 2) slightly yellow, with brown subapical spot on R_{2+3} confluent with brown circular median spot on R_{4+5} ; brown median spot on R_{4+5} separated from brown spot on crossvein dm-cu; R_{4+5} with small brown apical spot; brown cloud-like spot on r-m and on dm-cu; subcostal cell brown apically; costa with 2nd (between R_1 and R_{2+3}) and 3rd (between R_{2+3} and R_{4+5}) sections in proportion of 5.7: 2.1; r-m at middle of discal cell; ultimate and penultimate sections of M_1 in proportion of 2.3: 1.8; ultimate section of CuA_1 about 1/9 of penultimate. Halter yellow.

Abdomen (Fig. 5) yellow, tergite 1 lateral margin brown; tergite 2 posterior margin brown; tergites 3–6 margin blackish brown and each with a blackish brown middle stripe. Male genitalia (Figs 6–10): syntergosternite 7+8 boomerang-shaped, blackish brown; epandrium narrow in lateral view; surstylus setulose; strongly curved to sharp tip in lateral view; subtriangular with incurved tip in dorsal view. Hypandrium H-shaped and with a claviform ventral process at middle. Postgonite setulose, acute apically; phallus recurved in lateral view and finger-like apically, bifurcated distally in dorsal view; phallapodeme shorter phallus.

Distribution. China (Chongqing, Hubei, Sichuan).

Remarks. The new species is similar to *Homoneura* (*Homoneura*) *caperata* sp. nov., but can be separated from the latter by the wing with a brown spot at tip of Sc and R_1 , the surstylus being a singular, strongly curved to a sharp tip in lateral view, hypandrium H-shaped and with a claviform ventral process at middle. In *H. (H.) caperata*, surstylus consisting of a finger-like outer process and an inner process knife-like in ventral view; hypandrium Y-shaped and without ventral process.

It is also similar to *Homoneura* (*Homoneura*) *abnormis* Gao & Yang, 2004 in wing spots, but separated by surstylus being curved without a process in lateral view, hypandrium with a long claviform ventral process at middle. In *H. (H.) abnormis*, surstylus with a hairy process; hypandrium with a wide and short ventral process.

Homoneura (*Homoneura*) *laticosta* group

Key to species of *Homoneura* (*Homoneura*) *laticosta* group in China

(modified from Shi & Yang 2014; Zhang *et al.*, 2019)

1. Wing sapromyziform, with small costal black spines extending slightly before apex of R_{4+5} ; male genitalia: surstylus long and hooked with a sharp apex (see Shewell, 1971: plate II, fig. 9) *H. (H.) kaszabi* Shewell
- Wing homoneuriform, with small costal black spines extending to apex of R_{4+5} ; male genitalia not as above 2

2. Wing with broad deep brown area extending from costal margin to M_1 and a dark stripe on CuA_1 3
- Wing with brown area extending from costal margin to tip of R_{4+5} or M_1 , but no dark stripes on CuA_1 4
3. Mesonotum with a broad grayish brown medial stripe and a pair of presutural lateral spots and postsutural short lateral stripes; abdominal tergites 3–6 each with a brown medial stripe *H. (H.) discoidalis* (Kertész)
- Mesonotum without brown stripe; abdominal without medial stripe (Figs 14–15) *H. (H.) claviformis* sp. nov.
4. Mesonotum with a blackish gray area between postpronotum on anterior margin, a pair of blackish gray postsutural lateral stripes extending to postsutural third dorsocentral seta; acrostichal setae in 4 rows; katapisternum blackish gray on lower part *H. (H.) czernyi* Shatalkin
- Mesonotum yellow or yellowish brown, without pattern as above; acrostichal setae in 6–8 rows; katapisternum yellow 5
5. Mesonotum with a pair of brown medial stripes between dorsocentral setae rows; abdominal tergites 1–4 blackish brown except for yellow lateral margin and tergites 5–6 blackish brown; surstylus bifurcated apically in lateral view (see Shi & Yang, 2014: fig. 326; Sasakawa, 2002: fig. 14) *H. (H.) yehliuensis* Sasakawa
- Mesonotum without brown stripes; abdomen yellow; surstylus not as above 6
6. Arista pubescent, with longest ray about 1/4 height of 1st flagellomere; surstylus hooked apically in lateral and posterior views (see Shi & Yang, 2014: figs 119, 123–127) *H. (H.) grahami* Malloch
- Arista plumose, with longest ray longer than 1/3 height of 1st flagellomere; surstylus not as above 7
7. Wing with brown spots on crossvein r-m and dm-cu 8
- Wing without brown spots on crossvein r-m and dm-cu or only brown spot on dm-cu 9
8. Antennal 1st flagellomere yellowish brown on apical half; abdominal tergites 3–4 or 3–6 with a small brown medial spot; surstylus consisting of an anterior ventral process and a short apical process in lateral view (see Yang *et al*, 2002: figs 17, 18) *H. (H.) obtusa* Yang, Hu & Zhu
- Antennal 1st flagellomere entirely yellow; abdominal tergites without brown spots; surstylus with two sharp processes in lateral view (see Gao & Shi, 2019: figs 12–14, 17–18) *H. (H.) xunyangensis* Gao & Shi
9. Wing only with brown spot on dm-cu; surstylus short, slightly curved and acute apically in lateral view (see Shi & Yang, 2014: figs 12, 147–151) *H. (H.) laticosta* (Thomson)
- Wing without brown spot on crossvein r-m and dm-cu; surstylus long and curled upward in lateral view (see Gao & Yang, 2002: figs 7, 8) *H. (H.) longa* Gao & Yang

Homoneura (Homoneura) claviformis sp. nov.

(Figs 11–20)

Type material. **Holotype** ♂, China, **Chongqing**: Wuxi County, Yintiaoling Nature Reserve, Linkouzi Management and Protection Station (1244 m), 2022. VI. 28 (L), leg. Xulong Chen [31°28'30"N, 109°52'40"E]. **Paratypes**: 1♂, China, **Chongqing**: Wushan County, Wulipo National Nature Reserve, Dangyang Township (1812 m), 2022. VIII. 14, leg. Yameng Wang [31°24'40"N, 110°05'20"E]; 1♂1♀, China, **Hubei**: Shennongjia Nature Reserve, Guannenshan, (1560 m), 2019. VIII. 12, leg. Zhu Li [31°26'05"N, 110°22'50"E].

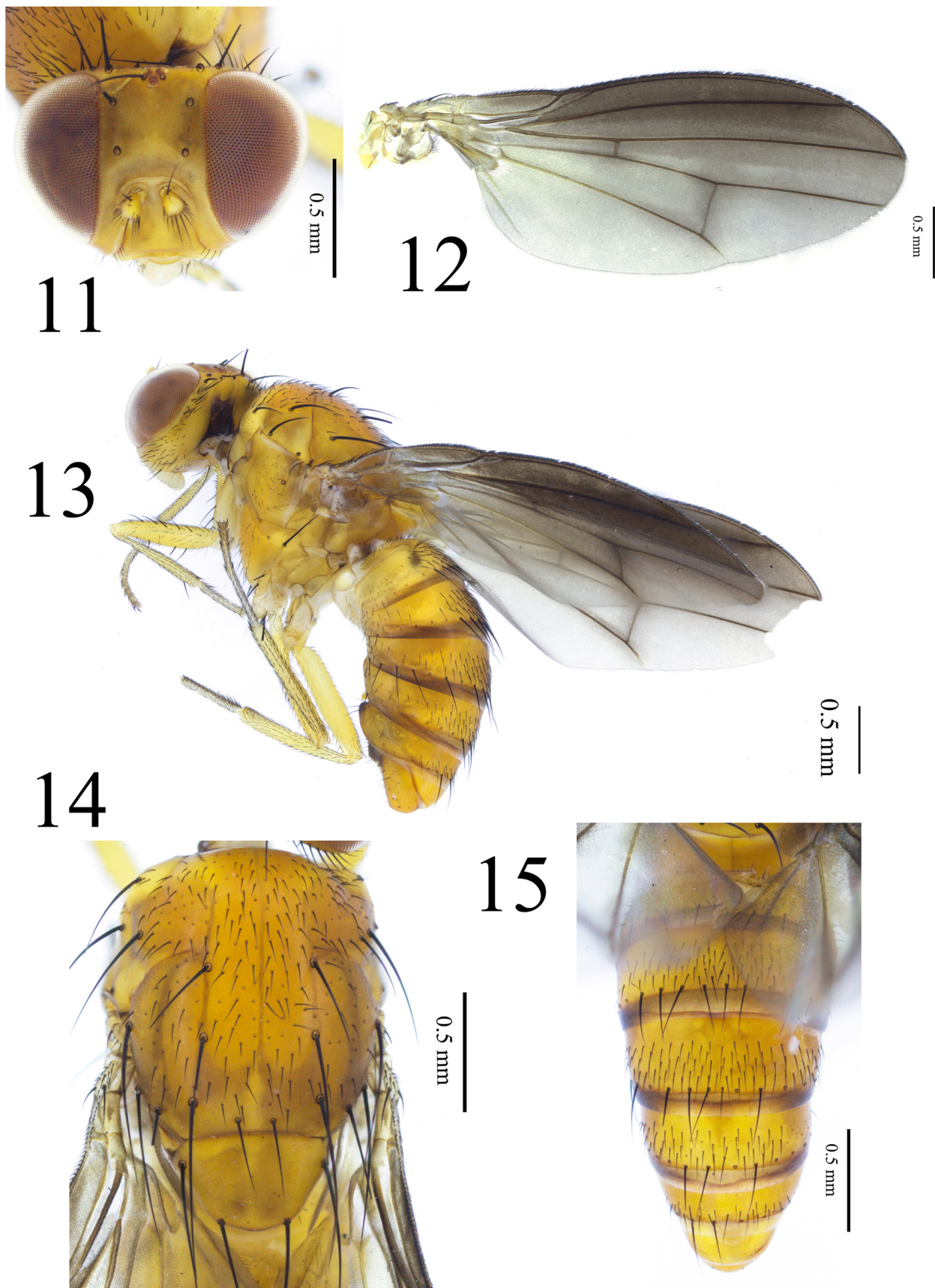
Etymology. Latin, *claviformis*, meaning “club-shaped”, referring to the surstylus. A feminine adjective.

Diagnosis. Wing brown on anterior half, with brown spot on crossvein dm-cu fused with brown anterior area; brown cloud-like spot on dm-cu; hypandrium Y-shaped; surstylus consisting of a long coniform process and a short process in ventral view.

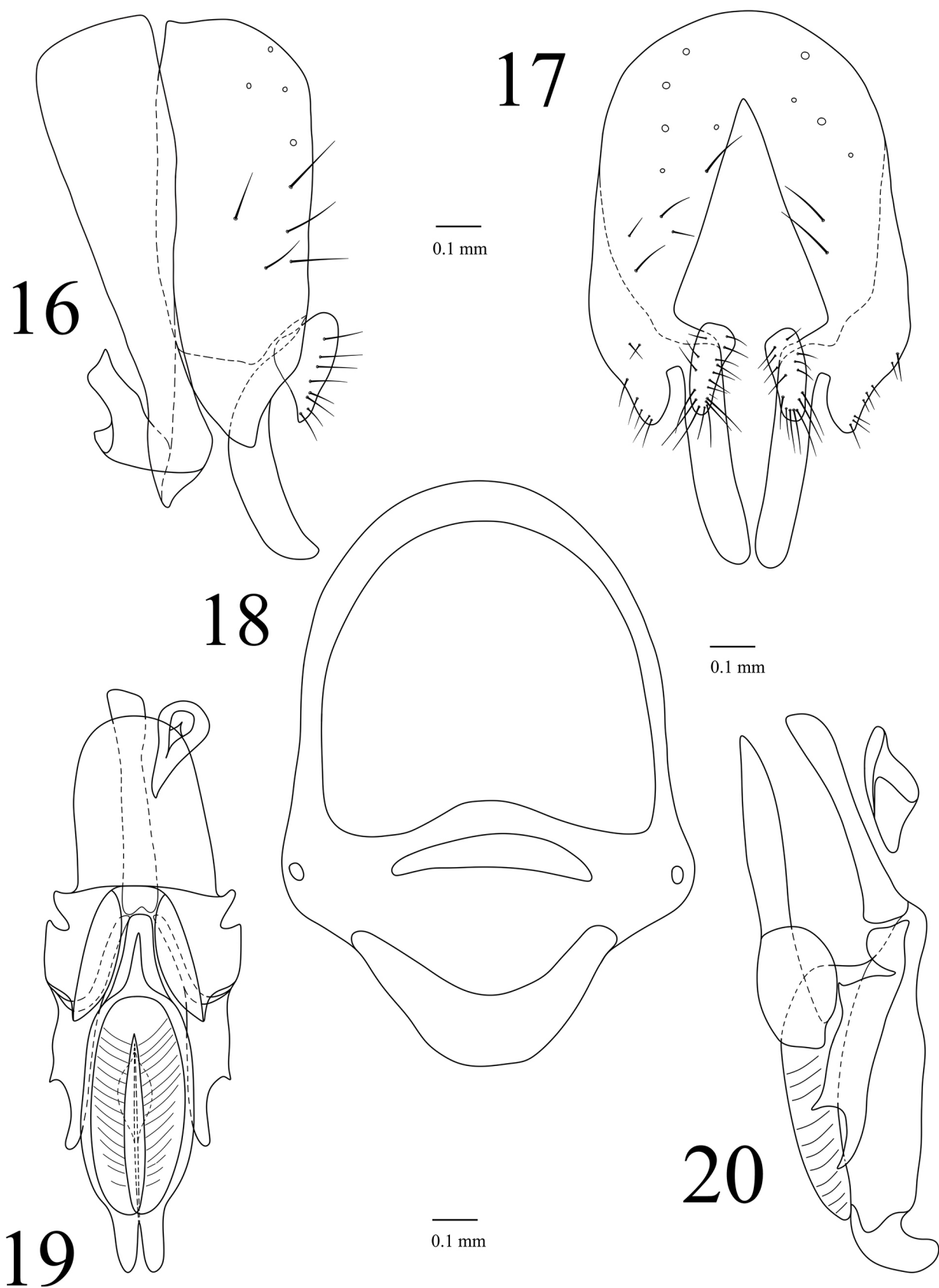
Description. MALE. Body length 4.4 mm, wing length 4.2 mm. FEMALE. Body length 3.9 mm, wing length 4.0 mm.

Head (Fig. 11) yellow. Frons as long as wide and parallel-sided, with a pair of pale brown stripes extending to sides of ocellar triangle; ocellar triangle yellow, ocellar seta developed. Gena about 1/5 height of eye. Antenna yellow, yellow, first flagellomere about 1.5 times longer than high; arista blackish brown except brown at base, pubescent, with longest ray as long as 1/6 height of first flagellomere. Prementum and labellum yellow, with pale yellowish and blackish setulae; palpus yellow with black setulae.

Thorax (Fig. 14) brownish yellow, with grey pruinosity. Postpronotal lobe yellow. Mesonotum with 0+3 dorsocentral setae, anteriormost dorsocentral seta behind transverse scutal suture; acrostichal setulae irregular in six rows; a pair of prescutellar setae, shorter than anteriormost dorsocentral setae; katapisternum with two strong setae. Legs yellow. Fore femur with six posterior dorsal setae, four posterior ventral setae and ctenidium with 12–13 short setae; fore tibia with one dorsal preapical seta and one short apical ventral seta. Mid femur with five anterior setae and one short apical posterior seta; mid tibia with one strong dorsal preapical seta and three strong apical ventral setae. Hind femur without seta in anterior view except with a few of pubescent apically; hind tibia with one dorsal preapical seta and one short apical ventral seta. Wing (Fig. 12) brown on anterior half, with brown spot on crossvein dm-cu fused with anterior brown area; brown cloud-like spot on dm-cu; costa with 2nd (between R_1 and R_{2+3}), 3rd



FIGURES 11–15. *Homoneura (Homoneura) claviformis* sp. nov. Male. 11. head, anterior view; 12. wing; 13. habitus, lateral view; 14. thorax, dorsal view; 15. abdomen, dorsal view.



FIGURES 16–20. *Homoneura (Homoneura) claviformis* **sp. nov.** Male. 16. syntergosternite 7+8 and epandrial complex, lateral view; 17. epandrial complex, posterior view; 18. syntergosternite 7+8, anterior view; 19. phallic complex, ventral view; 20. phallic complex, lateral view.

(between R_{2+3} and R_{4+5}), and 4th (between R_{4+5} and M_1) sections in proportion of 3.1: 1.0: 0.6; r-m behind middle of discal cell; ultimate and penultimate sections of M_1 in proportion of 2.0: 2.6; ultimate section of CuA_1 about 1/6 of penultimate. Halter yellow.

Abdomen (Fig. 15) yellow, tergites 2–5 posterior margin blackish brown. Male genitalia (Figs 16–20): syntergosternite 7+8 circular, with a crescent-like ventral process; epandrium nearly rectangle and broad in lateral view; surstylus consisting of a long coniform process and a short process in ventral view. Hypandrium Y-shaped. Postgonite with a long spine-like process and a short spine-like process apically in lateral view; phallus curved backwards apically and short hook-shaped in lateral view; phallapodeme shorter phallus.

Distribution. China (Chongqing, Hubei).

Remarks. The new species is similar to *Homoneura (Homoneura) discoidalis* (Kertész, 1915) in wing spots, but it can be separated from the latter by the wing lacking brown coloration in the basal part of vein CuA_1 along cell dm; body color being yellow, surstylus consisting of a long coniform process and a short process in ventral view; postgonite long and with two processes apically in lateral view; phallus without process on near apex. In *H. (H.) discoidalis*, the wing has the entire vein CuA_1 darkened along cell dm; there is a brownish-gray median stripe on the mesonotum; surstylus with a small process in ventral view; postgonite short and acute apically in lateral view; phallus with spine-like process on near apex.

Homoneura (Homoneura) notostigma group

Key to species of *Homoneura (Homoneura) notostigma* group in China

1. Mesonotum with a semicircular brown spot; inner surstylus broader in lateral view and slightly longer than outer surstylus *H. (H.) notostigma* (Kertész)
- Mesonotum without semicircular spot; surstylus not as above 2
2. Mesonotum with a pair of brown stripes; outer surstylus broad in lateral view and longer than inner surstylus, outer surstylus with serrated margin; postgonite furcated into two acute processes apically (Figs 24–25, 27–31) *H. (H.) nigrapicalis* **sp. nov.**
- Mesonotum with a pair of pale brown stripes or only with a pair of pale brown spots before scutoscuteellar suture; outer surstylus narrow and shorter than inner surstylus, phallus with a pair of processes on the side and a pair of processes on the back; postgonites bullhorn-shaped and tapering apically (Figs 35, 37–40). *H. (H.) longicerca* **sp. nov.**

Homoneura (Homoneura) longicerca **sp. nov.**

(Figs 21–31)

Type material. Holotype ♂, China, **Chongqing**: Wuxi County, Yintiaoling Nature Reserve, Linkouzi Management and Protection Station to Guimenguan (1349 m), 2022. VIII. 12, leg. Xulong Chen [31°28'36"N, 109°53'19"E].

Paratypes: 1♂, same data as holotype; 1♂, Linkouzi Management and Protection Station to Guimenguan (1349 m), 2022. VIII. 11, leg. Xulong Chen [31°28'36"N, 109°53'19"E]; 2♂, Yintiaoling Nature Reserve, Shuangyang Township, Daqiaowan (1057 m), 2022. VIII. 17, leg. Yao Yao [31°29'17.52"N, 109°49'24.06"E]; 1♂, Yintiaoling Nature Reserve, Linkouzi (1318 m), 2022. VIII. 20, leg. Yao Yao [31°28'24"N, 109°53'31"E]; 2♂1♀, China, **Guangxi**: Guilin, Huaping National Nature Reserve, Tianpingshan village (542 m), 2023. V. 28, leg. Pengyan You [25°38'04"N, 109°54'22"E].

Etymology. Latin, *longicerca*, referring to the cerci being long in lateral aspect. A noun in apposition.

Diagnosis. First flagellomere white with a black tip; mesonotum with a pair of pale brown stripes between dorsocentral setae (sometimes stripes absent and only with a pair of pale brown spots before scutoscuteellar suture), surstylus consisting of a curved subuliform inner process and a furcated outer process; cerci long and brown, phallus with two pairs of spine-like processes at middle in lateral view.

Description. MALE. Body length 4.2–4.4 mm, wing length 3.6 mm. FEMALE. Body length 3.5 mm, wing length 3.3 mm.

Head (Fig. 21) yellow orange. Frons as long as wide and parallel-sided; ocellar triangle brown, ocellar seta developed, longer than anterior fronto-orbital seta, anterior fronto-orbital seta shorter than 1/2 long of posterior fronto-orbital seta. Gena about 1/4 height of eye. Antenna with scape and pedicel yellow, first flagellomere white with a black tip, about 2 times longer than high; arista blackish brown except brown at base, long plumose, with

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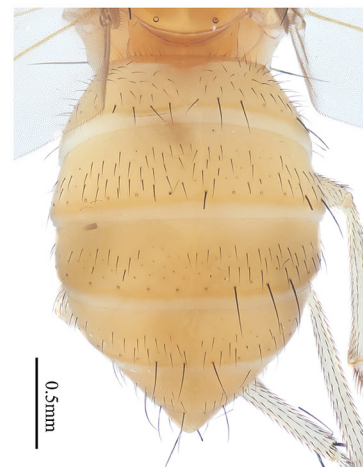
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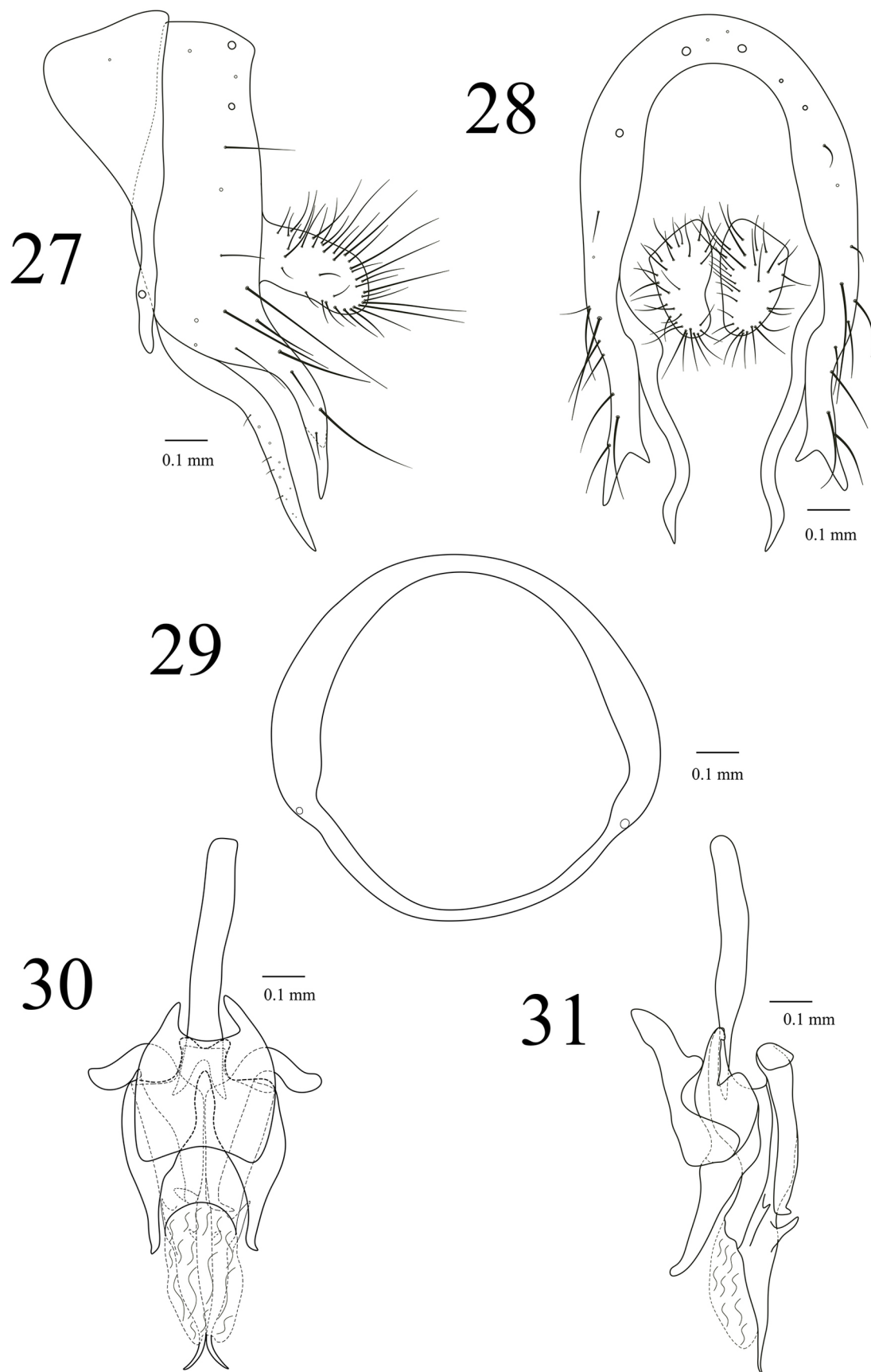
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FIGURES 21–26. *Homoneura (Homoneura) longicerca* **sp. nov.** Male. 21. head, anterior view; 22. wing; 23. habitus, lateral view; 24–25. thorax, dorsal view; 26. abdomen, dorsal view.



FIGURES 27–31. *Homoneura (Homoneura) longicerca* **sp. nov.** Male. 27. syntergosternite 7+8 and epandrial complex, lateral view; 28. epandrial complex, posterior view; 29. syntergosternite 7+8, anterior view; 30. phallic complex, ventral view; 31. phallic complex, lateral view.

longest ray longer than height of first flagellomere. Prementum and labellum pale yellow, with pale yellowish and blackish setulae; palpus yellow with black setulae.

Thorax (Figs 24–25) yellowish orange. Mesonotum with a pair of pale brown stripes between dorsocentral setae (sometimes stripes absent and only with a pair of pale brown spots before scutoscuteellar suture), 0+3 dorsocentral setae, anteriormost dorsocentral seta behind transverse scutal suture; acrostichal setulae in six rows; a pair of weak prescutellar setae; katapisternum with one strong seta. Legs whitish yellow. Fore femur with five posterior dorsal setae, three posterior ventral setae and ctenidium with 8–10 short setae; fore tibia with one dorsal preapical seta and one short apical ventral seta. Mid femur with five anterior setae and one short apical posterior seta; mid tibia with one strong dorsal preapical seta and three strong apical ventral setae (the middle one is the longest). Hind femur with one preapical anterior dorsal seta; hind tibia with one short apical ventral seta. Wing (Fig. 22) hyaline, veins yellow; without or with faint spot on crossvein dm-cu; costa with 2nd (between R_1 and R_{2+3}), 3rd (between R_{2+3} and R_{4+5}), and 4th (between R_{4+5} and M_1) sections in proportion of 5: 1.8: 1; r-m before middle of discal cell; ultimate and penultimate sections of M_1 in proportion of 1.4: 1; ultimate section of CuA_1 about 1/5 of penultimate. Halter yellow.

Abdomen (Fig. 26) yellow. Male genitalia (Figs 27–31): epandrium narrow in lateral view; surstylus consisting of a curved subuliform inner process and a furcated outer process. Cerci long and brown. Hypandrium broad in ventral view. Pregonite long spine-shaped; postgonites bullhorn-shaped and tapering apically, asymmetrical. Phallus with two pairs of spine-like processes at middle in lateral view; phallapodeme shorter phallus.

Distribution. China (Chongqing, Guangxi).

Remarks. The new species is similar to *Homoneura (Homoneura) notostigma* (Kertész, 1913), but can be separated by surstylus with a furcated outer process, phallus with two pairs of spine-like processes at middle in lateral view. In *H. (H.) notostigma*, surstylus without furcated outer process, phallus with a pair of spine-like processes.

The new species is similar to *H. (H.) demeijerii* Malloch, 1929, but separated by syntergosternite 7+8 circular, outer surstylus long and acute apically, phallus with acute processes on the back. In *H. (H.) demeijerii*, syntergosternite 7+8 saddle-shaped, outer surstylus short and blunt apically, phallus without acute processes on the back.

It is also similar to *Homoneura (Homoneura) nigrapicalis* **sp. nov.**, but separated by frons without brown stripes; mesonotum with a pair of pale brown stripes between dorsocentral setae or sometimes stripes absent and only with a pair of pale brown spots before scutoscuteellar suture; surstylus narrow and long in lateral view, outer surstylus without serrated margin in lateral view.

Homoneura (Homoneura) nigrapicalis **sp. nov.**

(Figs 32–40)

Type material. **Holotype** ♂, China, **Chongqing**: Wuxi County, Yintiaoling Nature Reserve, Hongqi Management and Protection Station, Daqiaowan (1079 m), 2022. VIII. 20, leg. Xulong Chen [31°29'36"N, 109°49'00"E].

Paratypes: 2♂, China, **Henan**, Luoyang City, Song County, Tianchishan (986 m), 2021. VI.17, leg. Ning Yu [34°15'33"N, 111°50'38"E]; 1♂2♀, China, **Henan**, Luoyang City, Song County, Tianchishan (986 m), 2021. VI.17, leg. Zhangyang Kong [34°15'33"N, 111°50'38"E].

Etymology. Latin, *nigrapicalis*, referring to the antenna first flagellomere being black apically. A feminine adjective.

Diagnosis. First flagellomere white with a black tip; mesonotum with a pair of brown stripes between dorsocentral setae, each widening posteriorly and extending onto scutellum; surstylus consisting of a finger-like inner process and a broad spine-like outer process, outer process with serrated margin and tapers to a sharpened tip in lateral view; hypandrium broadly H-shaped; phallus with two pairs of spine-like processes dorsally.

Description. **MALE.** Body length 3.1–3.3 mm, wing length 3.3 mm. **FEMALE.** Body length 2.8 mm, wing length 3.0 mm.

Head (Fig. 32) yellow. Frons as long as wide and parallel-sided, with a pair of brown stripes extending to sides of ocellar triangle; ocellar triangle brown, ocellar setae well-developed, longer than anterior fronto-orbital seta, anterior fronto-orbital seta shorter than 1/2 length of posterior fronto-orbital seta. Gena about 1/7 height of eye. Antenna with scape and pedicel yellow except first flagellomere white with distal half black, first flagellomere about 2.2 times longer than high; arista blackish brown except brown at base, long plumose, with longest ray as long



32



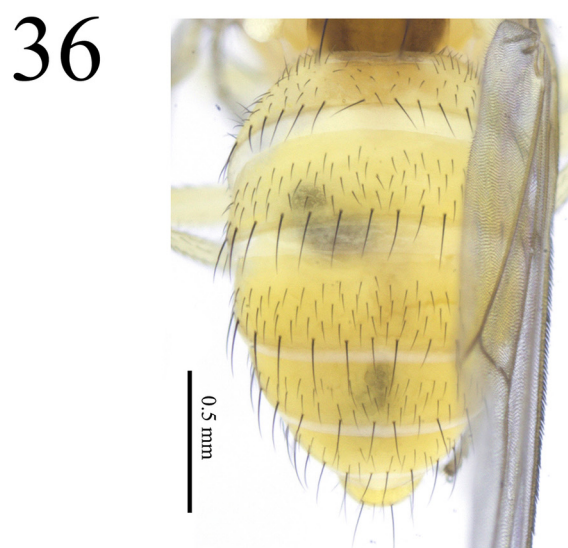
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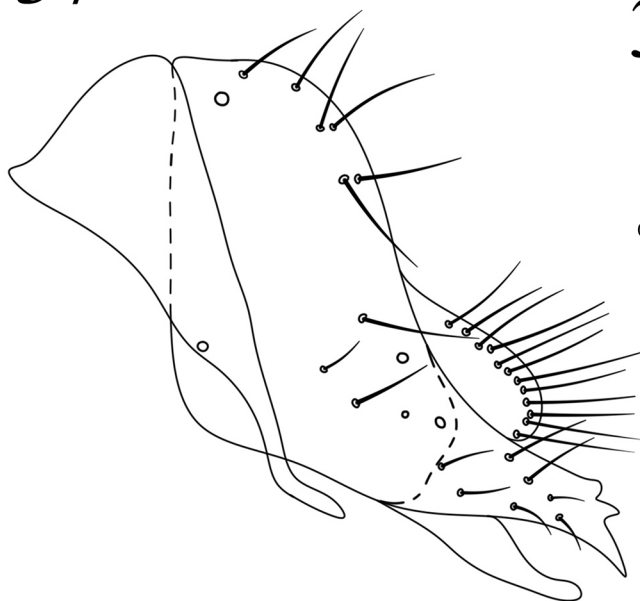
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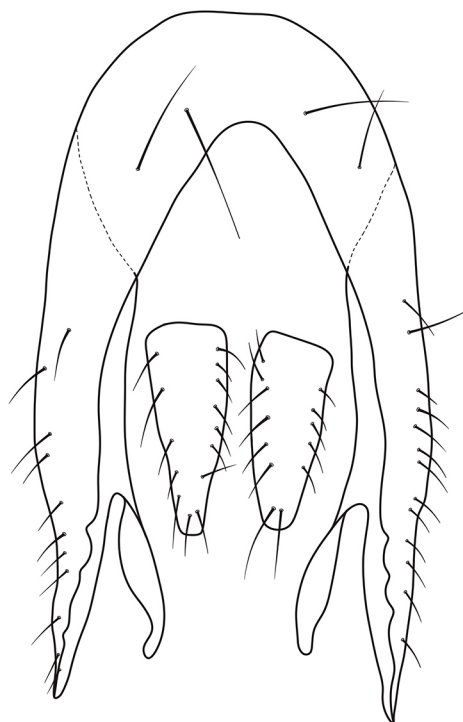
FIGURES 32–36. *Homoneura (Homoneura) nigrapicalis* sp. nov. Male. 32. head, anterior view; 33. wing; 34. habitus, lateral view; 35. thorax, dorsal view; 36. abdomen, dorsal view.

37

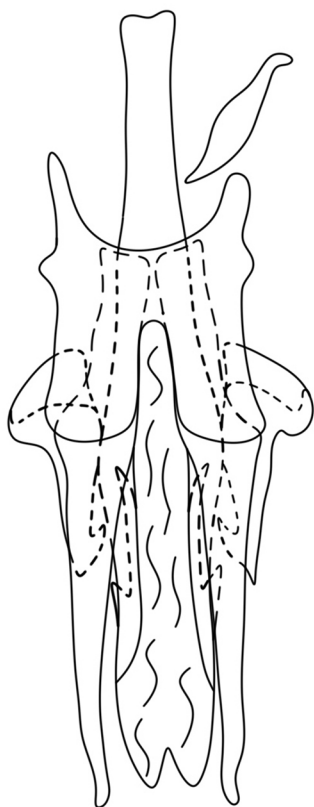


38

0.1 mm

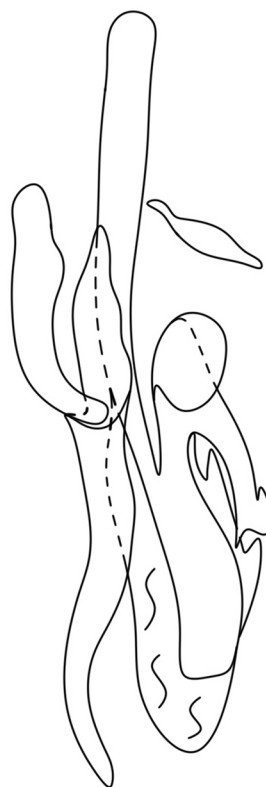


39



40

0.1 mm



FIGURES 37–40. *Homoneura (Homoneura) nigrapicalis* **sp. nov.** Male. 37. epandrial complex, lateral view; 38. epandrial complex, posterior view; 39. phallic complex, ventral view; 40. phallic complex, lateral view.

as height of first flagellomere. Prementum and labellum yellow, with pale yellowish and blackish setulae; palpus yellow with black setulae.

Thorax (Fig. 35) yellow. Mesonotum with a pair of brown stripes between dorsocentral setae, each widening posteriorly and extending through scutellum; 0+3 dorsocentral setae, anteriormost dorsocentral seta behind transverse scutal suture; acrostichal setulae in six rows; a pair of weak prescutellar setae; katapisternum with one to two strong setae. Legs whitish yellow. Fore femur with six to seven posterior dorsal setae, two posterior ventral setae and ctenidium with 10 short setae; fore tibia with one dorsal preapical seta and one short apical ventral seta. Mid femur with four to five anterior setae and one short apical posterior seta; mid tibia with one strong dorsal preapical seta and one strong apical ventral seta. Hind femur with one preapical anterior dorsal seta; hind tibia with one weak dorsal preapical seta and one short apical ventral seta. Wing (Fig. 33) hyaline, without spots; costa with 2nd (between R_1 and R_{2+3}), 3rd (between R_{2+3} and R_{4+5}), and 4th (between R_{4+5} and M_1) sections in proportion of 7.5: 2.5: 1.4; r-m before middle of discal cell; ultimate and penultimate sections of M_1 in proportion of 9.5: 12; ultimate section of CuA_1 about 1/5 of penultimate. Halter yellow.

Abdomen (Fig. 36) whitish yellow. Male genitalia (Figs 37–40): epandrium near trapezoidal in lateral view, elongated upside-down U-shaped in dorsal view; surstylus consisting of a finger-like inner process and a broad spine-like outer process, outer process with serrated margin and tapers to a sharpened tip in lateral view. Cerci brown. Hypandrium broadly H-shaped. Pregonite long spine-shaped; postgonite furcated into two acute processes apically. phallus with two pairs of spine-like processes dorsally; phallapodeme shorter phallus.

Distribution. China (Chongqing, Henan).

Remarks. The new species belongs to *Homoneura* (*Homoneura*) *notostigma* group, which includes 4 recognized Oriental species. The new species is different from *H. (H.) notostigma* (Kertész, 1913) by mesonotum with a pair of brown stripes between dorsocentral setae, outer surstylus broader than inner surstylus, hypandrium broadly H-shaped, phallus with two pairs of acute processes on the back. In *H. (H.) notostigma*, mesonotum with a pair of semicircular black spots, outer surstylus finer than inner surstylus, Hypandrium broad U-shaped, phallus with a pair of acute processes on the back.

The species is different from *H. (H.) demeijerii* Malloch, 1929 by the outer surstylus slightly longer than inner surstylus and acute apically, phallus with acute process on back. In *H. (H.) demeijerii*, outer surstylus short and blunt apically, phallus without acute processes.

The species is different from *H. (H.) longicerca* **sp. nov.** by the outer surstylus broader inner surstylus, hypandrium broadly H-shaped, phallus without process on sides.

Unplaced species

Homoneura (*Homoneura*) *caperata* **sp. nov.**

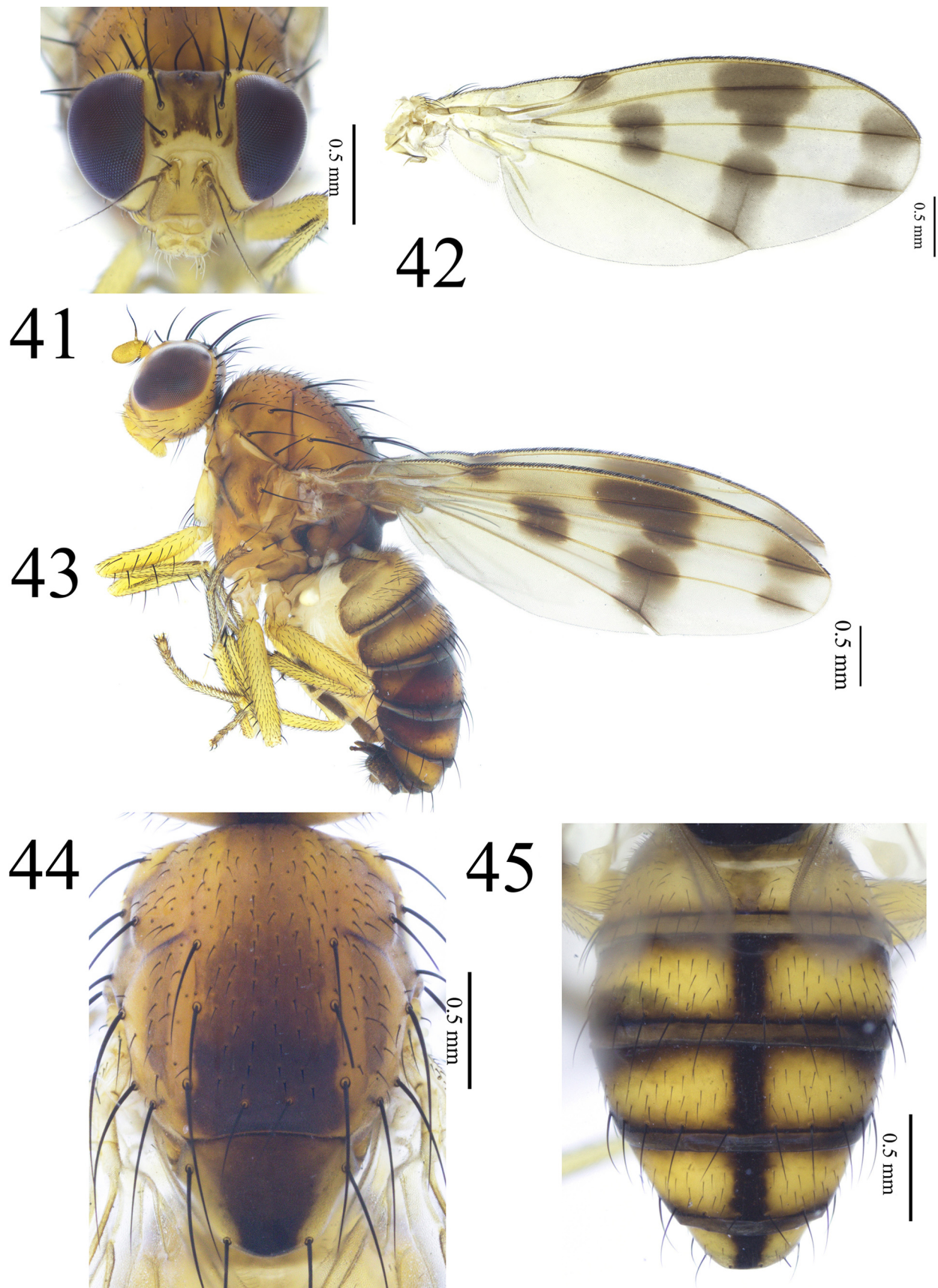
(Figs 41–50)

Type material. **Holotype** ♂, China, **Chongqing**: Wuxi County, Yintiaoling Nature Reserve, Linkouzi Management and Protection Station (1250 m), 2022. VIII. 10 (L), leg. Xulong Chen [31°28'29"N, 109°52'40"E]. **Paratypes**: 2♂, Yintiaoling Nature Reserve, Linkouzi Management and Protection Station to Guimenguan (1349 m), 2022. VIII. 11, leg. Xulong Chen [31°28'36"N, 109°53'19"E]; 1♂, Yintiaoling Nature Reserve, Linkouzi (1318 m), 2022. VIII. 20, leg. Yao Yao [31°24'56"N, 109°55'55"E]; 2♂3♀, China, **Zhejiang**, Lishui City, Fengyangshan, Fengyangjian (1664 m), 2021. V. 1, leg. Xulong Chen & Zhaoyang Kong [27°54'02"N, 119°09'34"E]; 2♂, Fengyangjian (1515 m), 2021. V. 2, leg. Xulong Chen [27°53'38"N, 119°10'05"E].

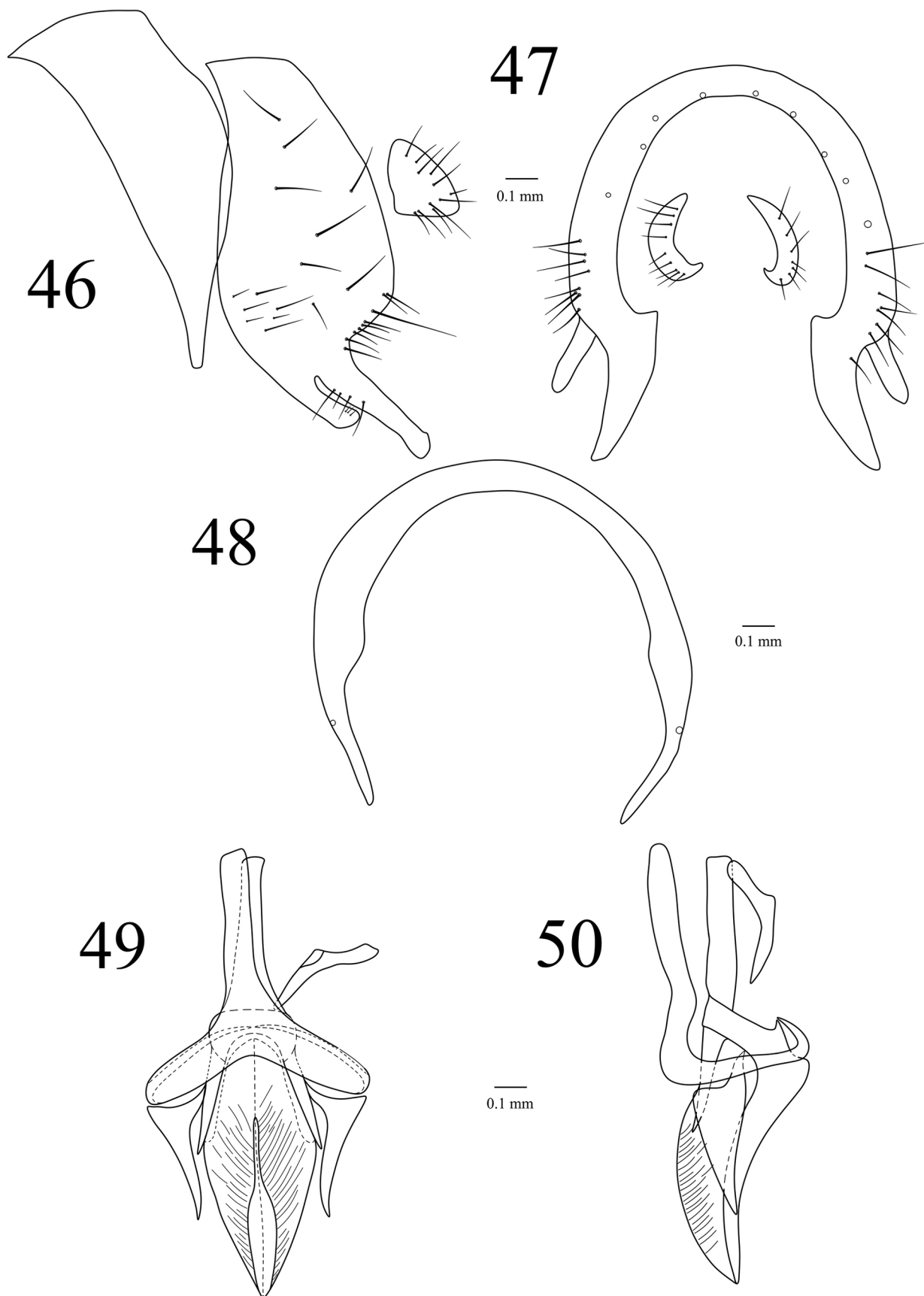
Etymology. Latin, *caperata*, meaning “wrinkled”, in reference to the many pleated striations of the phallus in ventral view. A feminine adjective.

Diagnosis. Mesonotum with a wide brown stripe, starting as pale from anterior margin and color gradually darkening to the posterior edge and through the scutellum; with a pair of brown stripes along transverse scutal suture; wing yellow, with brown subapical spot on R_{2+3} and brown circular median spot on R_{4+5} confluent and forming a T-shaped spot; postgonite subuliform; phallus with many pleated striations in ventral view.

Description. MALE. Body length 4.6 mm, wing length 4.7 mm. FEMALE. Body length 5.0 mm, wing length 5.0 mm.



FIGURES 41–45. *Homoneura (Homoneura) caperata* sp. nov. Male. 41. head, anterior view; 42. wing; 43. habitus, lateral view; 44. thorax, dorsal view; 45. abdomen, dorsal view.



FIGURES 46–50. *Homoneura (Homoneura) caperata* **sp. nov.** Male. 46. sytergosternite 7+8 and epandrial complex, lateral view; 47. epandrial complex, posterior view; 48. sytergosternite 7+8, anterior view; 49. phallic complex, ventral view; 50. phallic complex, lateral view.

Head (Fig. 41) yellow. Frons as long as wide and parallel-sided, with a pair of brown stripes extending to sides of ocellar triangle; ocellar triangle black, ocellar setae tiny, shorter than 1/2 length of anterior fronto-orbital seta, anterior fronto-orbital seta shorter than posterior fronto-orbital seta. Gena about 1/7 height of eye. Antenna yellow, first flagellomere about 1.5 times longer than high; arista blackish brown except yellow at base, pubescent, with longest ray shorter than 1/8 height of first flagellomere. Prementum and labellum yellow, with pale yellowish and blackish setulae; palpus yellow with black setulae.

Thorax (Fig. 44) brownish yellow, with grey pruinosity. Mesonotum with a wide brown stripe, starting as pale from anterior margin and color gradually darkening to the posterior edge and through the scutellum; with a pair of brown stripes along transverse scutal. 0+3 dorsocentral setae, anteriormost one close behind transverse scutal suture; acrostichal setulae in six rows; a pair of strong prescutellar setae, slightly shorter than anteriormost dorsocentral setae; katapisternum with two strong setae. Legs yellow. Fore femur with six to seven posterior dorsal setae, four posterior ventral setae and ctenidium with 16 short setae; fore tibia with one long dorsal preapical seta and one short apical ventral seta. Mid femur with eight anterior setae and one short apical posterior seta; mid tibia with one strong dorsal preapical seta and two strong apical ventral setae. Hind femur with one preapical anterior dorsal seta; hind tibia with one weak dorsal preapical seta and one short apical ventral seta. Wing (Fig. 42) yellow, with brown subapical spot on R_{2+3} and brown circular median spot on R_{4+5} confluent and forming a T-shaped spot; brown median spot on R_{4+5} narrowly fused with brown spot on crossvein dm-cu; brown apical spot on R_{4+5} and M_1 nearly confluent and forming pale brown connecting area; brown cloud-like spot on r-m and dm-cu; subcostal cell with a brown apical spot; costa with 2nd (between R_1 and R_{2+3}), 3rd (between R_{2+3} and R_{4+5}), and 4th (between R_{4+5} and M_1) sections in proportion of 5.8: 1.7: 1.3; r-m at middle of discal cell; ultimate and penultimate sections of M_1 in proportion of 3.5: 2.75; ultimate section of CuA_1 about 1/8 of penultimate. Halter yellow.

Abdomen (Fig. 45) yellow. syntergite 1+2 lateral margin and posterior margin brown; tergites 3–6 with anterior and posterior margins blackish brown and each with a blackish brown medial stripe. Male genitalia (Figs 46–50): syntergosternite 7+8 blackish brown and saddle-shaped; epandrium nearly trapeziform in lateral view, saddle-shaped in dorsal view; surstylus consisting of a finger-like outer process and a longer inner process knife-like in ventral view. Hypandrium Y-shaped. Postgonite subuliform; phallus with many pleated striations in ventral view; phallapodeme slightly shorter phallus.

Distribution. China (Chongqing, Zhejiang).

Remarks. The new species is similar to *Homoneura (Homoneura) mediclavata* **sp. nov.**, but it can be separated from the latter by the wing without brown spot at tip of Sc and R_1 , brown median spot on R_{4+5} being narrowly fused with the brown spot on crossvein dm-cu; surstylus consisting of a finger-like outer process and an inner process knife-like in ventral view; hypandrium Y-shaped, without claviform process. In *H. (H.) mediclavata* **sp. nov.**, brown median spot on R_{4+5} separated from brown spot on crossvein dm-cu; surstylus only with one process in ventral view; hypandrium H-shaped and with a claviform ventral process at middle.

It is also similar to *Homoneura (Homoneura) abnormis* Gao & Yang, 2004 in wing spots, but separated by the surstylus consisting of a finger-like outer process and a knife-like inner process in ventral view; the hypandrium Y-shaped without ventral process; the gonopod without setulae. In *H. (H.) abnormis*, the surstylus with anterior processes short and baggy; the hypandrium with ventral process; the gonopod with long bristles.

It is also similar to *Homoneura (Homoneura) flavomarginata* (Kertész, 1915) in wing spots, but separated by the apical spots on R_{4+5} and M_1 confluent. In *H. (H.) flavomarginata*, apical spots on R_{4+5} and M_1 separated.

Homoneura (Homoneura) fuscifemoris **sp. nov.**

(Figs 51–60)

Type material. Holotype ♂, China, **Chongqing**: Wuxi County, Yintiaoling Nature Reserve, Lanying Town, Qingcaoping (1783 m), 2022. VIII. 15 (L), leg. Xulong Chen [31°24'29"N, 109°53'08"E]. **Paratypes**: 1♀, Yintiaoling Nature Reserve, Linkouzi Management and Protection Station (1250 m), 2022. VIII. 10 (L), leg. Xulong Chen [31°28'29"N, 109°52'40"E]; 2♂5♀, China, **Zhejiang**, Lishui City, Jingning County, Shangbiao Village (1038 m), 2021. V.11, leg. Zhaoyang Kong [27°42'53"N, 119°36'14"E].

Etymology. Latin, *fuscifemoris*, referring to the legs having dark brown femora. A noun in apposition.

Diagnosis. Face slightly humped on middle; parafacial with inner margin black; frons with a triangular yellow middle stripe extending to sides of ocellar triangle and anterior margin with a triangular yellow spot; epandrium

subovoid in lateral view, with cluster of setulae apically apically; postgonite bifurcated into an acute process and a blunt process apically.

Description. MALE. Body length 3.2 mm, wing length 3.2 mm. FEMALE. Body length 3.0–3.2 mm, wing length 3.0 mm.

51



52



53 a



53 b



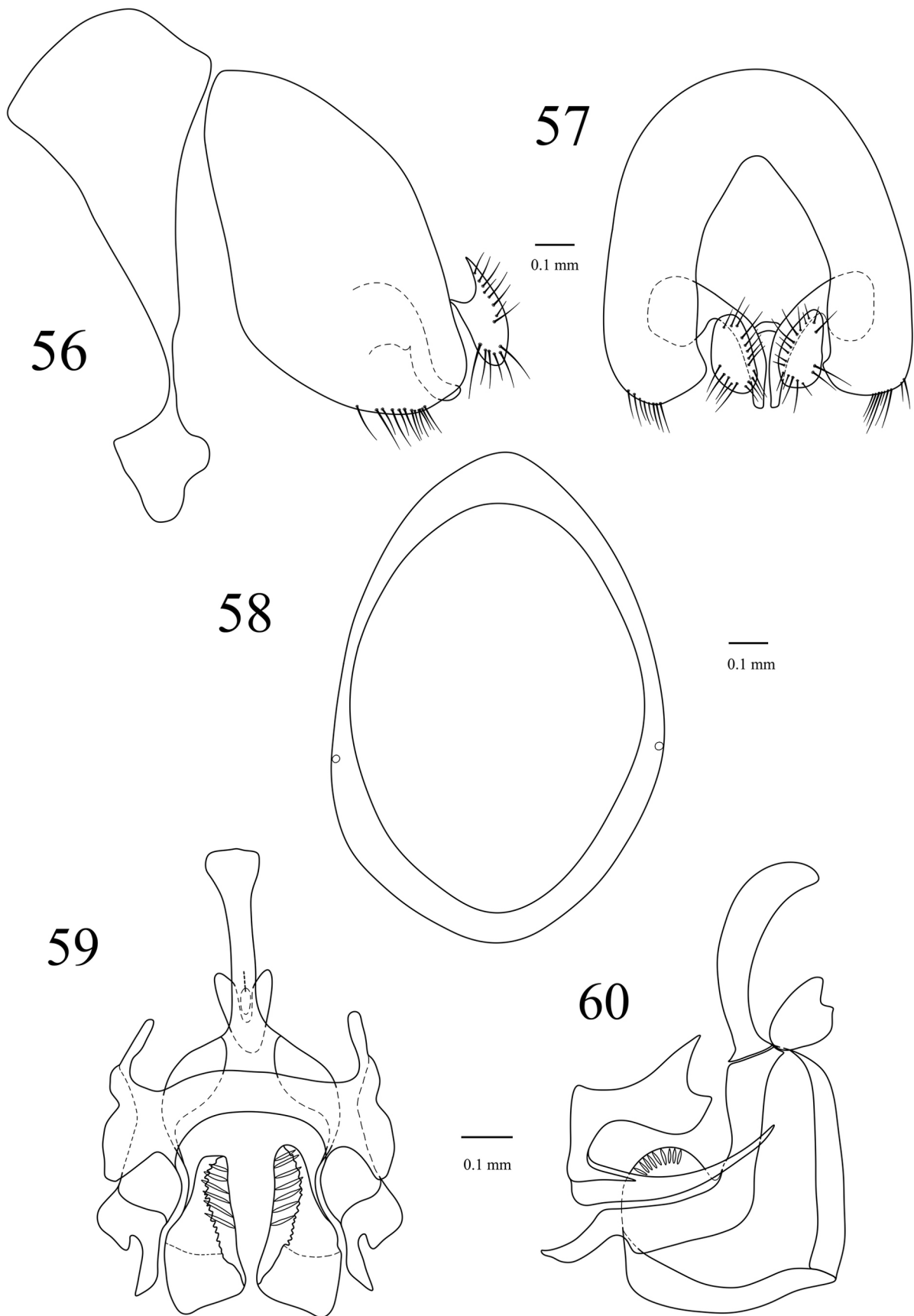
54



55



FIGURES 51–55. *Homoneura (Homoneura) fuscifemoris* sp. nov. Male. 51. head, anterior view; 52. wing; 53a. habitus, lateral view; 53b. head, lateral view; 54. thorax, dorsal view; 55. abdomen, dorsal view.



FIGURES 56–60. *Homoneura (Homoneura) fuscifemoris* sp. nov. Male. 56. sytergosternite 7+8 and epandrial complex, lateral view; 57. epandrial complex, posterior view; 58. sytergosternite 7+8, anterior view; 59. phallic complex, ventral view; 60. phallic complex, lateral view.

Head (Figs 51, 53b) brown. Face slightly humped on middle; parafacial with inner margin black. Frons as long as wide and parallel-sided, anterior margin with a triangular yellow spot, and with a triangular yellow middle stripe extending to sides of ocellar triangle; ocellar triangle black, ocellar setae well-developed, longer than 1/2 length of anterior fronto-orbital seta, anterior fronto-orbital seta slightly shorter than posterior fronto-orbital seta. Gena about 1/6 height of eye. Antenna yellow, first flagellomere about 1.4 times longer than high; arista blackish brown except pale brown basally and yellow basally on second segment, pubescent, with longest ray shorter than 1/8 height of first flagellomere. Prementum and labellum white, with light colored setulae; palpus brown with black setulae.

Thorax (Fig. 54) brownish black, with brownish grey pruinosity. Mesonotum with 0+3 dorsocentral setae, anteriormost dorsocentral seta behind transverse scutal suture; acrostichal setulae irregular in six rows; a pair of prescutellar setae, shorter than anteriormost dorsocentral setae; katapisternum with one strong seta and one weak seta. Legs dark brown, except tips of femora, extremities of tibiae, and all tarsi yellow. Fore femur with six posterior dorsal setae, five posterior ventral setae and ctenidium with 14 short setae; fore tibia with one long dorsal preapical seta and two short apical ventral setae. Mid femur with five-six anterior setae and one short apical posterior seta; mid tibia with one strong dorsal preapical seta and two strong apical ventral setae. Hind femur with one preapical anterior dorsal seta; hind tibia with one weak dorsal preapical seta and one short apical ventral seta. Wing (Fig. 52) hyaline, tinged yellow, without spots; subcostal cell hyaline; costa with 2nd (between R_1 and R_{2+3}), 3rd (between R_{2+3} and R_{4+5}), and 4th (between R_{4+5} and M_1) sections in proportion of 5.7: 1.9: 1.1; r-m behind middle of discal cell; ultimate and penultimate sections of M_1 in proportion of 5.0: 2.0; ultimate section of CuA_1 about 1/4 of penultimate. Halter yellow.

Abdomen (Fig. 55) black, with brownish grey pruinosity. Male genitalia (Figs 56–60): syntergosternite 7+8 circular and subapical narrow in lateral view; epandrium subovoid in lateral view, with cluster of setulae apically; surstylus “6”-shaped in posterior view, extended from inner edge of epandrium. Hypandrium H-shaped. Postgonite bifurcated into an acute process and a blunt process apically. Phallus widened apically in lateral view; phallapodeme shorter phallus.

Distribution. China (Chongqing, Zhejiang).

Remarks. The new species is similar to *Homoneura* (*Homoneura*) *noticomata* Shi & Yang, 2014, but it can be separated from the latter by acrostichal setulae being in six irregular rows; syntergosternite 7+8 without dorsomedial setae; hypandrium H-shaped; phallus wide apically in lateral view. In *H. (H.) noticomata*, acrostichal setulae are in eight irregular rows; syntergosternite 7+8 with dorsomedial setae; hypandrium Y-shaped; phallus with long spine-shaped process at tip.

Acknowledgements

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