

## Two new species and one new combination of *Helina* Robineau-Desvoidy, 1830 (Diptera: Muscidae) from China

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Two new species of the genus *Helina* Robineau-Desvoidy, 1830 from Sichuan, China are described and illustrated, i.e. *Helina fulvibasicosta* Ming-Fu Wang **sp. n.** and *Helina flavipes* Ming-Fu Wang & Chen Sun **sp. n.** After re-examining the holotype, *Helina occidentalisinica* Feng, Shi & Li, 2005 is transferred to the genus *Hebecnema* Schnabl.

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### 1. Introduction

The genus *Helina* Robineau-Desvoidy, 1830 is the second largest genus of Muscidae, in which over 570 species are currently known worldwide. Due to the facts that many specialists consider that *Helina* is a “rest-all” repository and *Helina* includes so many species, it is difficult to identify the species correctly.

Since the beginning of the 20th century, 231 species of *Helina* have been identified in China by 47 Chinese colleagues in 30 different organizations, accounting for 40% of the species worldwide, among which 199 are endemic to China. Since 2000, we have been engaged in faunal studies of this group in China, especially focusing on the revision work of the genus. While sorting and identifying *Helina* from material in the College of Chemistry and Life Sciences, Shenyang Normal University, Shenyang, China, we found two new species collected from Sichuan. In this paper, we describe those two new species, and provide a

new combination for *Helina occidentalisinica* Feng, Shi & Li, 2005.

### 2. Material and methods

Morphological terminology of McAlpine (1981) is followed. Absolute measurements are used for body length in millimeters (mm).

Abbreviations used for characters include: *a* = anterior seta, *acr* = acrostichal seta, *ad* = anterodorsal seta, *av* = anteroventral seta, *d* = dorsal seta, *dc* = dorsocentral seta, *ia* = intra-alar seta, *p* = posterior seta, *pd* = posterodorsal seta, *pra* = prealar seta, *pv* = posteroventral seta, and *v* = ventral seta.

All specimens studied are deposited in the College of Chemistry and Life Sciences, Shenyang Normal University, Shenyang and in the Shanghai Entomological Museum, Chinese Academy of Sciences, Shanghai (SEMCAS). The specimens from SEMCAS are noted.

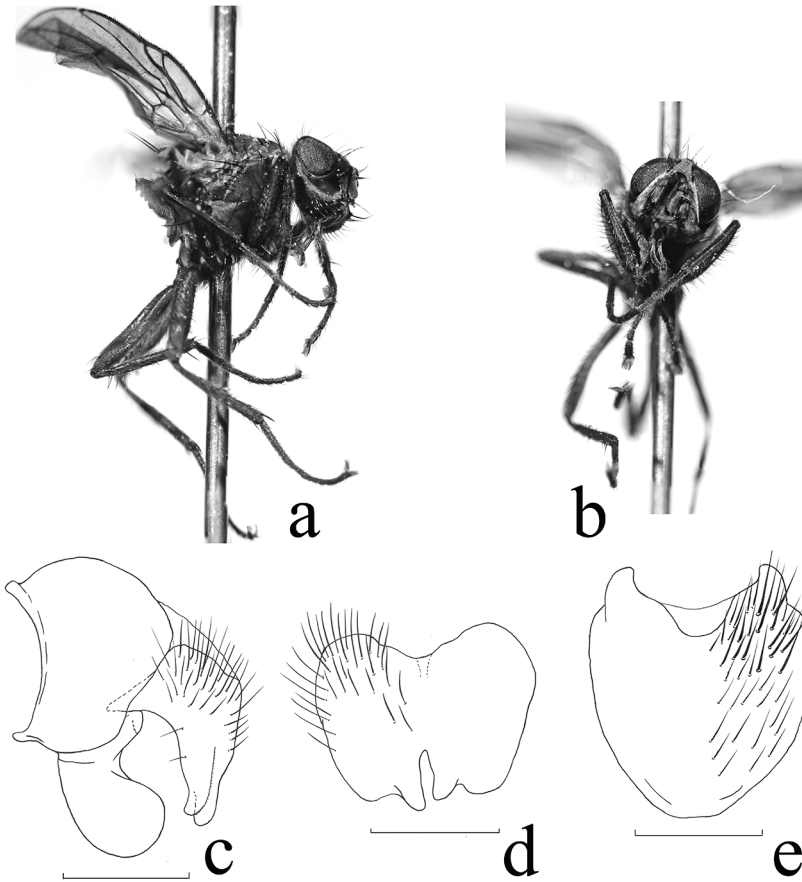


Fig. 1. *Helina fulvibasicosta* Ming-Fu Wang sp. n., male holotype. – a. Body, lateral view. – b. Body, anterior view. – c. Terminalia, lateral view, scale 0.25 mm. – d. Cercal plate, ventral view, scale 0.25 mm. – e. Sternite 5, scale 0.4 mm.

### 3. Taxonomy

#### 3.1. *Helina fulvibasicosta* Ming-Fu Wang sp. n. Fig. 1

*Type material.* Holotype, male, China: Mt. Balang (30°54'N, 102°54'E), alt. 4,600 m a.s.l., 8.VIII.2005, leg. M. F. Wang. Paratype, 1 male, same data as holotype.

*Description.* Male. Body length 6.2 mm.

Head. Eyes bare; facets not enlarged; frons moderately wide, about 1.2 times of distance between posterior ocelli, and 1.6–1.8 times as wide as antennal first flagellomere; frontal vitta black, at the narrowest point about 4 or 5 times of fronto-orbital; frontal setae 7, situated on lower 2/3, reaching the level of anterior the ocellus, orbital setae absent; ocellar setae longer than the lower frontal seta; fronto-orbital plate and parafacial with greyish-brown pruinosity, parafacial about 1.2–1.3 times as wide as flagellomere; antenna

black, flagellomere 2.5 times as long as broad, arista short plumose, the longest hair about 2/3 of flagellomere-width; lunule dark brown, epistoma not projecting, vibrissal angle behind profrons in profile; gena with grey pruinosity, the upper margin of gena dark reddish-brown, gena about 1/3 of eye-height, the upper margin of gena with a row of upcurved setae, gena and metacephalon with black hairs; proboscis short, labella large, prementum with greyish thin pruinosity, 2 times longer than width; palpus black and claviform, slightly oblate at distal part and a little longer than prementum.

Thorax. Ground colour black with thinner grayish-white pruinosity, scutum with four obscure longitudinal vittae, the inside vittae not reaching to the scutellum suture; presutural *acr* 3 rows, posterior *acr* 1, *dc* 2+3, *ia* 0+2; *pra* strong, distinctly longer than posterior notopleural seta; notopleuron, lateral margin and lower surface of scutellum bare; basisternum, proepisternum,

anepimeron, meron and katepimeron bare; katepisternal bristle 2:2, spiracles brown, calypters small.

Wing. Brown, veins brown, wing-base yellow, basicosta yellowish-brown, costal spine inconspicuous; vein Sc not curved bow-like, node of Rs bare on ventral and dorsal surfaces; vein M straight, vein R4+5 and M well separated from each other on apical part; cross-vein r-m robust, veins m-m straight, cross veins without conspicuous cloud; calypters yellow, the lower one projecting; halteres brownish-yellow.

Legs. Black, fore tibia with one median *p*, and several long hairs on ventral surface; mid femur without conspicuous *av* row but with a complete and long *pv* row, *ad* row on basal 1/2; mid tibia with 1 *ad*, 2 or 3 *pd*; hind coxa bare on posterior surface; hind femur with complete and long *av* row, with 6 or 7 *pv* setae on 1/5 of distal on posterior surface; hind tibia with 3 *ad*, without *pd*, hind tibia with 2 rows of slender and longer setae on *av* and *pv* surfaces, the length of setae equal to the width of hind femur.

Abdomen. Oval, black in ground colour, with dark grayish-brown pruinosity; tergites 2 to tergite 4 each with 1 pair of big and subquadrate dark spots, slightly extended outside on latter margin; tergite 5 without spots; each side of sternite 1 with one seta, sternite 5 and terminalia of male as shown in Fig. 1.

Female. Unknown.

*Etymology.* The species name is from Latin and refers to the yellow colour of basicosta.

*Remarks.* This is a rare species. It has yellow legs and a yellow basicosta, so it can be easily separated from most Palaearctic *Helina* species, except *H. altica* Wang, Xue & Wang, 2005, which has been described from Mt. Doxong La, Xizang, China. *H. fulvibasicosta* can be incorporated into the male key of Xue *et al.* (2005) as follows:

73. Hind tibia with dense but untidy rows of long hairs on anteroventral and posteroventral surfaces simultaneously 74a  
 74a. Tibia yellow; crossvein r-m and dm-cu clouded; frons narrow, about as wide as anterior ocellus; prealar seta about 1/2 length of the second notopleural bristle

*H. cothurnata* (Rondani)

- Leg wholly black; crossvein r-m and dm-cu unclouded; frons broader, wider than the distance between outer margins of posterior ocelli; parafacial as wide as antennal flagellomere; prealar seta as long as the second notopleural bristle 74b

- 74b. Parafacial as wide as antennal flagellomere; prealar seta as long as the second notopleural bristle; frontal vitta as wide as or narrower than anterior ocellus; outside processes longer than inner processes in the distal of cersus

*H. celsa* (Harris)

- Parafacial wider than antennal flagellomere; prealar seta longer than the second notopleural bristle; frontal vitta more than twice as wide as anterior ocellus; the length of outside processes equal to or shorter than inner processes in the distal of cersus 74c

- 74c. The longest hair of arista as long as one-third width of antennal flagellomere; basicosta dark brown, crossveins r-m clouded, fore tibia without median *p*, mid tibia without *ad*, sternite 1 bare *H. altica* Wang, Xue & Wang

- The longest hair of arista as long as two-third width of antennal flagellomere; basicosta yellowish brown, crossveins r-m without cloud; fore tibia with 1 strong median *p*, mid tibia with 1 long *ad*, sternite 1 with hairs

*H. fulvibasicosta* sp. n.

### 3.2. *Helina flavipes*

Ming-Fu Wang & Chen Sun, sp. n. Fig. 2

*Type material.* Holotype, male, China: Mt. Erlang (30°6'N, 102°32'24"E), alt. 1,900–2,930 m a.s.l., 3.VII.2006, leg. L.Y. Feng. Paratypes, 1 male, same data as holotype.

*Description.* Male. Body length 6.0 mm.

Head. Eyes with obviously light brownish hairs, facets enlarged on anterior margin in upper part; frontal narrow, frons-width at the narrowest part nearly equal to the distance between anterior ocellus, frontal setae 5–6, situated on the lower half of frons, orbital seta absent, ocellus seta shorter than lower frons seta; fronto-orbital plate and parafacial with greyish-brown pruinosity, parafacial slightly narrower than flagellomere, antenna black, flagellomere 3 times as long as broad, arista long plumose, the longest hair

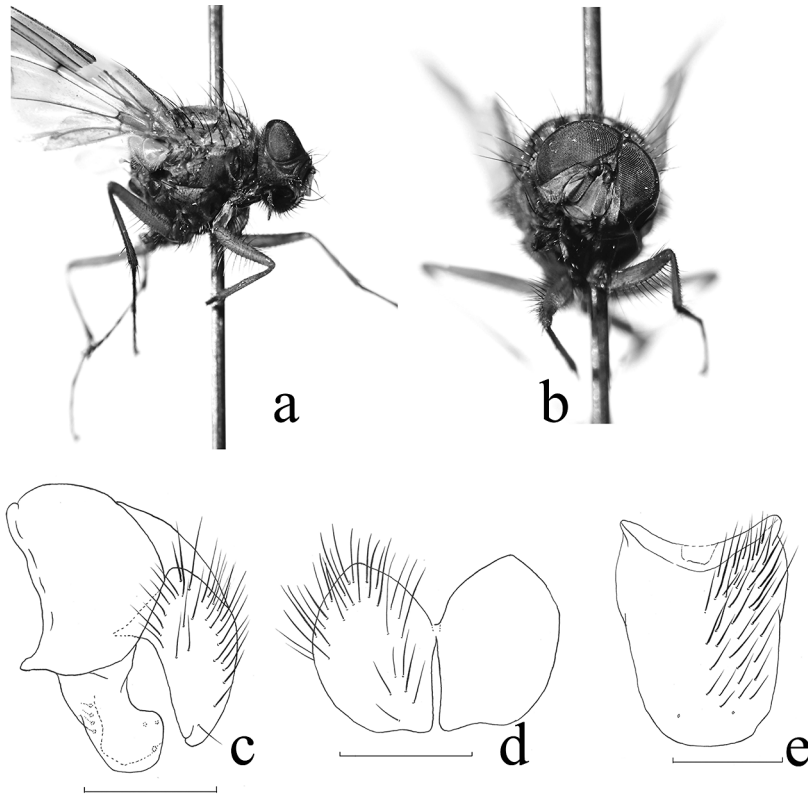


Fig. 2. *Helina flavipes* Ming-Fu Wang & Chen Sun, **sp. n.**, male holotype. – a. Body, lateral view. – b. Body, anterior view. – c. Terminalia, lateral view, scale 0.25 mm. – d. Cercal plate, ventral view, scale 0.25 mm. – e. Sternite 5, scale 0.4 mm.

slightly shorter than flagellomere; lunule yellow, arista short plumose; epistoma not projecting, vibrissal angle behind profrons in profile; upper margin of genae with a row of upcurved setae; gena and postgena with black hairs; gena with grayish-brown pruinosity; proboscis short, with grayish-brown pruinosity, prementum 2 times longer than wide; labella large, palpus black, except on basal part brown, length longer than prementum.

**Thorax.** Ground-colour black with dark greyish-brown pruinosity, scutum with four dark longitudinal vittae, the inside vittae nearly reaching to the middle of scutellar suture; 5–6 rows of presutural *acr*, posterior *acr* 1, *dc* 2+4, *ia* 0+2, *pra* strong, slightly shorter than posterior notopleural seta; notopleuron, lateral margin and lower surface of scutellum bare; basisternum, proepisternum, anepimeron, meron and katepimeron bare; katepisternal bristle 2:2, spiracles dark brown and large.

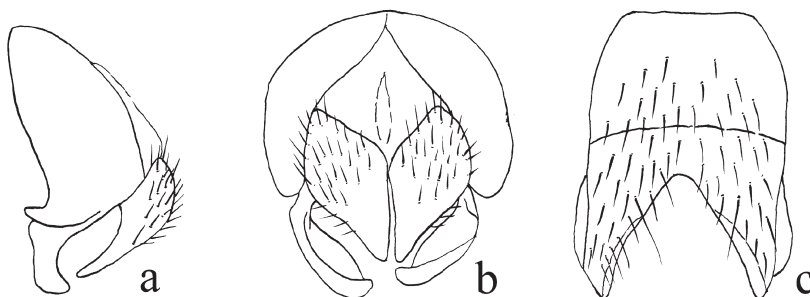
**Wing.** Light brown, veins dark brown, wing-base and other position with same colour, tegula and basicosta dark brown, costal spine strong,

shorter than the length of cross-veins r-m, vein Sc curved bow-like; node of Rs bare on ventral and dorsal surfaces; vein m1+2 stright, vein m1+2 and vein R4+5 well separated from each other at apex, cross-vein r-m robust; crossveins with obvious cloud, crossveins m-m projecting forward in middle, with little cloud; calypters yellow, the lower one projecting tongue-like; halteres yellowish-orange.

**Legs.** Femora and tibiae yellow, tarsi black; fore tibia with one median *p*, mid femur with complete *av* row, fine and obvious; *ad* row present on basal 3/5, median *pv* row long, ones on distal part slightly shorter, mid tibia with 3 long *p*, hind coxa bare on posterior surface, hind femur with long *av* and *ad*, obvious and long hair-like *pv* row on distal 1/3, the longest seta equal to or shorter than the width of hind femur, hind tibia with 3 *av*, 2 *ad*, with 6 or 7 short semierect setae row behind median part.

**Abdomen.** Oval, black in ground colour, with dark golden brown pruinosity; tergites 3 and 4 each with a pair of big and subrectangular dark patches without pruinosity, sternite 1 bare.

Fig. 3. *Hebecnema occidentalisinica* (Feng, Shi & Li, 2005), male holotype. – a. Terminalia, lateral view. – b. Cercal plate, ventral view. – c. Sternite 5. (Adapted from Feng *et al.* 2005).



Female. Unknown.

*Etymology.* The species name is derived from Latin, referring to its yellow legs.

spicuous, shorter than the length of cross-vein r-m; hind tibia with 3 *av*

*H. flavipes* **sp. n.**

*Remarks.* *H. flavipes* **sp. n.** differs from other *Helina* species in its light body colour, with ten rows of *acr* setae, and lack of *dc* setae. It can be incorporated into the male key of Xue *et al.* (2005) as follows:

- 104a. Fore tibia with 1 median *p* 104b
- Fore tibia without median *p* 105
- 104b. Frons about 1.5 times as wide as antennal flagellomere; parafacial nearly 1.75–2.0 times as wide as antennal flagellomere; costal spine inconspicuous; hind tibia with 7–8 *av* *H. bibreviplumosa* Xue & Feng
- 105. Frons narrower than the width of anterior ocellus; parafacial narrower than the width of antennal flagellomere; costal spine con-

**3.3. *Hebecnema occidentalisinica* (Feng, Shi & Li, 2005), comb. n. Fig. 3**

*Helina occidentalisinica* Feng, Shi & Li, 2005: 93, fig. 1–4.

*Type material.* Holotype, male, China: Mt. Erlang, alt. 2,760 m a.s.l., 21. VI. 1982, leg. P. Shi (SEMCAS).

*Remarks.* Emden (1951) divided *Helina* into five subgenera, i.e. *Helina s. str.*, *Euspilaria* Malloch, *Helinella* Malloch, *Hebecnema* Schnabl and *Mydhelina* Emden. However, some of the groups treated as subgenera by Emden are now recognised as genera, i.e., *Hebecnema* Schnabl, while other taxa described as genera by Emden

Table 1. Diagnostic characters between *Hebecnema* Schnabl and *Helina* Robineau-Desvoidy.

	<i>Hebecnema</i>	<i>Helina</i>
Length of anterodorsal seta in hind tibia on apex part	At most equal to width of tibia	Longer than width of tibia
Upper proepimeral seta	Absent or hair-like	Usually distinct or strong
Prealar seta	Absent or hair-like	Usually obviously present or strong, few hair-like
Abdominal tergites	Without pairs of spots, at most with a median vitta	Usually with pairs of spots, few species with median vitta
Katepisternal seta	Usually 1:2	Usually 2:2
Width of parafacial	Narrower than width of antennal flagellomere	Equal to or wider than width of antennal flagellomere
Head in profile view	Upper part of head with a slightly flattened appearance	Upper part of head with a raised appearance
Sternite 5 of abdomen	Lateral lobe usually raised	Lateral lobe often flattened
Surstylus in profile view	Slender and long	Thicker and shorter



have been synonymized with *Helina* (see Pont 1977, 1980, 1986). Hennig (1957–1958), Fan (1965, 1992) and Pont (1972, 1980, 1986) have all accepted *Hebecnema* Schnabl as an independent genus. The genus *Hebecnema* can be differentiated from *Helina* as presented in Table 1.

Based on re-examination of the holotype of *H. occidentalisinica* and the original description of Feng *et al.* (2005), we found the main characters of this species different from *Helina*. The diagnostic characters, including smaller body, upper part of head with a slightly flattened appearance in profile view, parafacial narrower, without *pra*, katepisternal seta 1:2, mid tibia with 2 *p*, hind tibia with 1 *av* and 1 *ad*, are the main diagnostic characters of *Hebecnema*. According to the morphology of terminalia, we also found that the main characters of *H. occidentalisinica*, including the distal part of terminalia slightly protecting, cerci slender and constricted in profile view, tergite 5 are all in accordance with *Hebecnema*. We conclude that *H. occidentalisinica* should be assigned to *Hebecnema*.

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