

Diagnosis and key for the *Helina annosa*-group (Diptera: Muscidae) from China, with descriptions of nine new species

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(Received 18 November 2013; accepted 8 July 2014; first published online 11 September 2014)

Nine new species of *Helina annosa*-group from China, namely *H. longievecta* sp. nov., *H. longisurstyla* sp. nov., *H. midmargiseta* sp. nov., *H. nigriabdomilis* sp. nov., *H. nivimonta* sp. nov., *H. setosiannosa* sp. nov., *H. shii* sp. nov., *H. subfloscula* sp. nov. and *H. subnigriabdomilis* sp. nov., are described and illustrated. Diagnosis of this group, a key and distributions of the species are also given.

<http://www.zoobank.org/urn:lsid:zoobank.org:pub:3516C15F-F4AA-4391-B944-84556792CC83>

Keywords: Diptera; Muscidae; *Helina annosa*-group; new species; Key; China

Introduction

Helina Robineau-Desvoidy, established in 1830, is the second largest genus in the family Muscidae, distributed in all zoogeographic regions of the world, and comprises about 660 scientific names (over 530 species), the majority of which are from the Palaearctic region (Emden 1951, 1965; Hennig 1957–1958; Hockett 1965; Pont 1977, 1980, 1986, 1989; Xue 1998; De Carvalho et al. 2005; Wang et al. 2008; Xue and Tian 2012). The genus *Helina* was classified into seven groups by Ringdahl for the first time in 1924, and then classified into 21 groups by Ringdahl in 1949. Although Ringdahl did a tremendous amount of work on this genus, his conclusions were preliminary and need further investigation. Ringdahl (1956) did not quote these groups in his book *Svensk Insektfauna*, but Hennig (1957–1958) accepted them in his monograph of *Palaearctic Muscidae*, although there was no in-depth study. Emden (1951, 1965) and Skidmore (1985) further divided this genus into subgenera according to morphological or biological characters. However, some of the groups are now redefined as genera, while others have been placed in synonymy. Modern taxonomists such as Pont (1977, 1980, 1986, 1989) did a large amount of analysis and research about generic synonymies and homonymies in the genus *Helina* (Xue and Tian 2012).

China is located in two zoogeographic regions, namely the Palaearctic and the Oriental regions. A large number of species of *Helina* are found in China. The domestic study of the *Helina* genus began in the early 1980s. From the early 1980s to 1990s, the species of genus *Helina* rose from more than 10 species up to 69 species (Fan 1992). By 1998, Xue and Chao, in the book *Flies of China*, reported 96 species of genus *Helina* in China (Xue and Chao 1998). According to statistics, so far 229 species in the genus *Helina* are known from China (Xue and Tian 2011;

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Xue et al. 2012; Wang 2013). This paper reports on 43 species (including 41 endemic Chinese species) and gives the diagnosis of the *Helina annosa*-group; it establishes the model of male cerci (Figure 1), and describes nine new species. A key and the distribution of the species are also given. In addition, this group was classified into two subgroups according to whether the centre of the scutellum ventrally is with hairs or without hairs, namely the *Helina annosa*-subgroup and the *Helina evecta*-subgroup.

Some authors believe that *Helina dianica* Qing and Feng, 2005 and *Helina sarmentosa* Fang and Fan, 1993 are synonymies according to their same type localities. In this paper, the authors scrutinized and compared the original descriptions of the two species, and found that there was still some difference between the two species both in terminalia characteristics and in external morphology characteristics. Different characteristics are as follows. *Helina dianica* Qing and Feng, 2005, circus narrow in distal half, hollow of circus deep in distal margin, surstylus curved backwards; *fr* on lower half of frons, parafacial about 1.4 times as broad as postpedicel, length of postpedicel about 2.6 times as long as its width, thorax with dense, grey

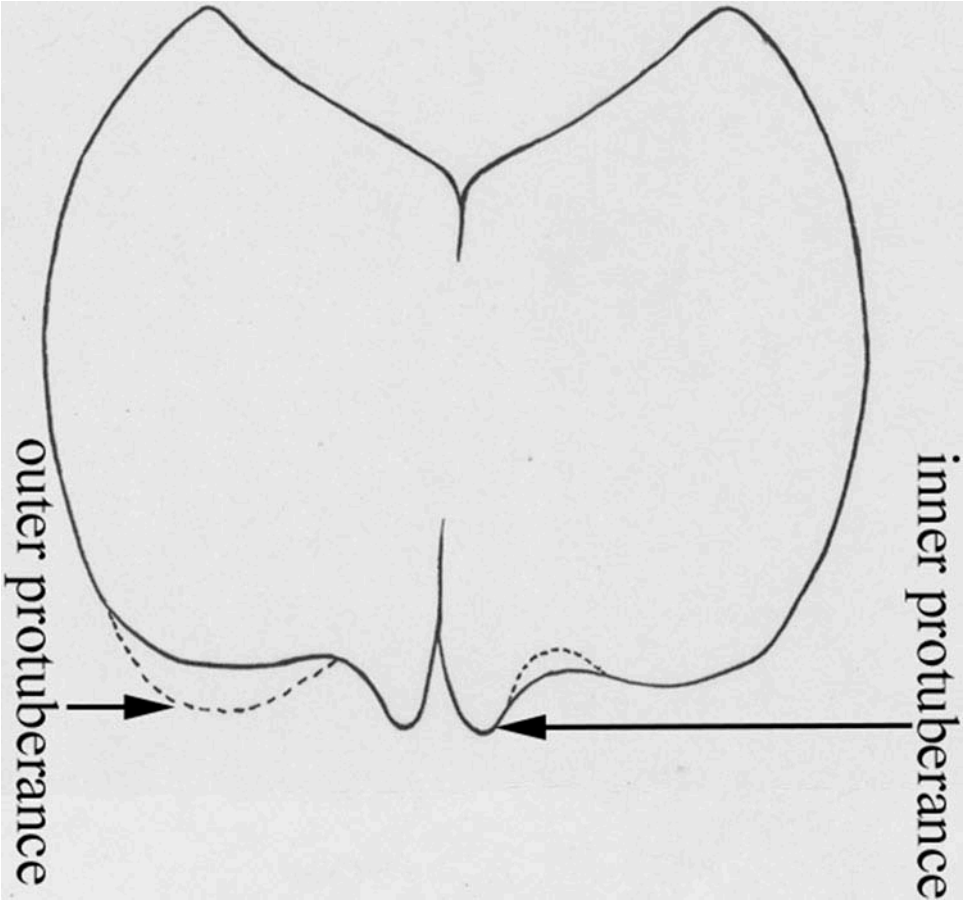


Figure 1. The model of *Helina annosa*-group male cerci.

pruinosity, lateral surface of scutellum bare, cross-veins r-m and dm-cu clouded, haltere red orange, tergite 5 with a pair of stripe-like patches, sternite 1 bare. *Helina sarmentosa* Fang and Fan, 1993, circus broad in distal half, hollow of circus shallow in distal margin, surstylus straight; *fr* complete, parafacial about 2.0 times as broad as postpedicel, length of postpedicel about 3.0 times as long as its width, pruinosity of thorax indistinct, lateral surface of scutellum with hairs, cross-veins r-m and dm-cu not clouded, haltere orange yellow, tergite 5 without patches, sternite 1 with hairs. According to the above discussion and analysis, the authors beg to differ from the opinion and divide them into different species.

Material and methods

The type specimens of nine new species are all deposited in the Institute of Entomology, Shenyang Normal University, Shenyang, China. This study was based on the research method of combining external morphology with terminalia characteristics. The terminology followed is that of McAlpine (1981). Absolute measurements are given in mm. The following abbreviations are used: IESNU, Institute of Entomology, Shenyang Normal University; *ors*, orbital setae; *fr*, frontal setae; *prst acr*, presutural acrostichal setae; *acr*, acrostichal setae; *dc*, dorsocentral setae; *psut dc*, postsutural dorsocentral setae; *ial*, intra-alar setae; *pra*, prealar setae; *av*, anteroventral setae; *a*, anterior setae; *ad*, anterodorsal setae; *pd*, posterodorsal setae; *p*, posterior setae; *pv*, posteroventral setae; *v*, ventral setae; r-m, radio-medial cross-vein; dm-cu, discal medial-cubital cross-vein; R₄₊₅, fourth and fifth branches of radius; and M, media vein.

Diagnosis of *Helina annosa*-group (males)

Notopleuron and meron below spiracle with hairs, lateral surface and ventral lateral margin of scutellum usually with black hairs (*Helina nigriannosa*, *Helina floscula*, *Helina plumipostitibia* and *Helina subfloscula* bare), hind tibia usually with strong *av* and setiform *p*, basisternum of prosternum and radial node bare, centre of scutellum underside of *Helina annosa*-subgroup bare (*Helina evecta*-subgroup with hairs), legs black, at most the base of tibia yellow (such as *Helina luyashanensis* and *Helina sinoccidentala*). Outer protuberance of cercus always shorter than inner protuberance.

Key to species of *Helina annosa*-group (males)

1. Centre of scutellum beneath with hairs (*Helina evecta*-subgroup) 2
 - Centre of scutellum beneath bare (*Helina annosa*-subgroup) 7
2. Sternite 1 bare 3
 - Sternite 1 with hairs 4
3. Costal spine indistinct, R₄₊₅ and M diverging in distal part, cross-veins not clouded; mid femur with 4 *pv* in basal half, hind femur with strong *av* in apical two-fifths *Helina luyashanensis*
 - Costal spine short, R₄₊₅ and M parallel, r-m clouded; mid femur with complete *pv* row, 5 strong in basal, hind femur with strong *av* in apical half *Helina subevecta*

4. Arista short plumose, the longest arista hairs about a half width of postpedicel *Helina nemorum*
 – Arista plumose or long plumose, the longest arista hairs at least equal to width of postpedicel 5
5. Cross-vein r-m clouded, fore tibia without *p* *Helina mimevecta*
 – Cross-veins not clouded, fore tibia with *p* 6
6. Lateral surface of scutellum with hairs *Helina evecta*
 – Lateral surface of scutellum bare *Helina pleuranthus*
7. Sternite 1 bare 8
 – Sternite 1 with hairs 18
8. Arista short plumose, the longest arista hairs about two-thirds width of postpedicel *Helina brachytophalla*
 – Arista plumose or long plumose, the longest arista hairs at least equal to width of postpedicel 9
9. Inner vitta of scutum reaching scutoscutellar suture 10
 – Inner vitta of scutum not reaching scutoscutellar suture 13
10. *Pra* absent 11
 – *Pra* distinct 12
11. Frons about 2.5 times as broad as anterior ocellus; basicosta dark orange; fore tibia without *p*, mid femur with 4 to 5 strong *pv*, mid tibia with 3 *p*
 *Helina jiaodingshanica*
 – Frons about 1.3 times as broad as anterior ocellus; basicosta yellow; fore tibia with 3 *p*, mid femur with 8 to 10 *pv*, mid tibia with 6 to 7 *p*
 *Helina dianica*
12. Length of postpedicel about 3.5 times as long as width, costal spine indistinct, cross-veins not clouded, fore tibia with 2 to 3 *p* *Helina nigriannosa*
 – Length of postpedicel about 2.5 times as long as width, costal spine short, cross-veins clouded, fore tibia without median *p* *Helina barkamica*
13. Lateral surface of scutellum bare, ventral lateral margin with hairs
 *Helina shuensis*
 – Lateral surface of scutellum with hairs, ventral lateral margin bare or with hairs 14
14. Ventral lateral margin of scutellum with hairs 15
 – Ventral lateral margin of scutellum bare 16
15. Cross-vein r-m not clouded; hind femur with 4 *av* in apical one-quarter, hind tibia with 4 *av* *Helina azaleella*
 – Cross-vein r-m clouded; hind femur with 9 to 10 *av* in apical three-quarters, hind tibia with 9 to 10 *av* in basal two-thirds
 *Helina subnigriabdomilis* Xue and Sun, sp. nov.
16. *Pra* absent *Helina sichuanica*
 – *Pra* distinct 17

17. Fore tibia with 1 *p*, lateral lobe of sternite 5 verrucose *Helina mimifica*
 – Fore tibia with 2 to 3 *p* in apical half, lateral lobe of sternite 5 broad, not
 verrucose *Helina emeishanana*
18. *Pra* absent 19
 – *Pra* distinct 22
19. Fore tibia with 2 to 4 median *p* *Helina sarmentosa*
 – Fore tibia without median *p* 20
20. Inner vitta of scutum not reaching scutoscutellar suture *Helina maquensis*
 – Inner vitta of scutum reaching scutoscutellar suture 21
21. R_{4+5} and *M* diverging in distal part, haltere yellow; mid femur with complete
pv row, strong in basal part, mid tibia with 6 to 7 *p*, hind tibia with 5 *ad*;
 distal part of cercus without outer protuberance in posterior view
 *Helina floscula*
 – R_{4+5} and *M* straight, haltere dark orange; mid femur with *pv* row in basal two-
 fifths, mid tibia with 4 to 5 *p* in apical two-thirds, hind tibia with 3 to 4 *ad*; distal
 part of cercus with distinct outer protuberance in posterior view
 *Helina subfloscula* Xue, sp. nov.
22. Lateral surface of scutellum bare 23
 – Lateral surface of scutellum with hairs 25
23. Costal spine absent *Helina plumipostitibia*
 – Costal spine distinct 24
24. Cross-veins clouded; mid femur with 3 to 4 *pv* in basal half, hind tibia with 3 to 4
av, *ad* 4 *Helina xinanana*
 – Cross-veins not clouded; mid femur with complete *pv* row, hind tibia with 4 to 5
av, *ad* 2 to 3 *Helina midmargiseta* Xue, sp. nov.
25. Ventral lateral margin of scutellum bare 26
 – Ventral lateral margin of scutellum with hairs 29
26. Katepisternal setae 1:2 *Helina quadratisterna*
 – Katepisternal setae 2:2 27
27. Mid tibia with 7 to 9 strong *p* *Helina setipostitibia*
 – Mid tibia at most with 5 *p* 28
28. Arista plumose, the longest arista hairs subequal to width of postpedicel; mid
 tibia with 5 *p*, hind femur with 5 to 6 *av* in apical one-third
 *Helina nigriabdomilis* Xue, sp. nov.
 – Arista plumose, the longest arista hairs longer than width of postpedicel; mid
 tibia with 3 to 4 *p*, hind femur with 3 to 4 strong *av* *Helina annosa*
29. Fore tibia without median *p* 30
 – Fore tibia with median *p* 38
30. Inner vitta of scutum not reaching scutoscutellar suture 32
 – Inner vitta of scutum reaching scutoscutellar suture 31

31. Length of postpedicel about 4.0 times as long as its width, hind tibia with 7–8 *ad* *Helina setosiannosa* Xue, sp. nov.
 – Length of postpedicel about 3.0 times as long as its width, hind tibia with 2 *ad* *Helina tuomuerra*
32. Mid femur with *pv* only in basal half 33
 – Mid femur with complete *pv* row 34
33. Frons subequal to anterior ocellus in width; legs black, only bases of tibiae orange yellow, hind tibia with 5 to 6 *av*; anterior margin of surstylus cavate *Helina sinoccidentala*
 – Frons about 1.5 times as broad as anterior ocellus; legs complete black, hind tibia with 7 to 8 *av*; anterior margin of surstylus curvate forward *Helina gongshanensis*
34. Cross-veins clouded *Helina maae*
 – Cross-veins not clouded 35
35. Costal spine absent 36
 – Costal spine distinct 37
36. The longest arisal hairs about twice as long as width of postpedicel; hind tibia with 5 *av* in apical half; tergite 5 with median orange vitta; length of surstylus at most 1.3 times as long as its width *Helina baoshanensis*
 – The longest arisal hairs about 2.5 times as long as width of postpedicel; hind tibia with 5 *av* in middle part; each tergite without vitta; length of surstylus at least twice as long as its width *Helana longisurstyla* Xue and Sun, sp. nov.
37. Hind femur without *pv*, hind tibia with 13 strong *p* in middle part *Helina septentrionalis*
 – Hind femur with 2 to 3 *pv* only in apical part, hind tibia with a row of setiform setae in basal half *Helina longievecta* Xue, sp. nov.
38. Inner vitta of scutum reaching scutoscutellar suture *Helina fica*
 – Inner vitta of scutum not reaching scutoscutellar suture 39
39. Cross-veins clouded 40
 – Cross-veins not clouded 42
40. Frontal setae 5 pairs *Helina shii* Xue, sp. nov.
 – Frontal setae 7 to 8 pairs 41
41. Arista plumose, the longest arisal hairs subequal to width of postpedicel, costal spine absent *Helina pedana*
 – Arista long plumose, the longest arisal hairs about 1.7 times as long as width of postpedicel, costal spine distinct *Helina platycephala*
42. Arista plumose, the longest arisal hairs subequal to width of postpedicel; hind femur with 4 to 5 *av* in apical one-third; outer protuberance of cercus distinct *Helina nivimonta* Xue, sp. nov.
 – Arista long plumose, the longest arisal hairs longer than width of postpedicel; hind femur with 5 to 6 *av* in apical half; cercus without outer protuberance *Helina subfica*

Distribution of species of the *Helina annosa*-group from China and descriptions of nine new species

***Helina annosa* (Zetterstedt, 1838)**

Distribution

Shanxi, Sichuan, Yunnan, Heilongjiang, China; Japan; Israel; Europe (type-locality: Sweden); North America; Nearctic Region.

***Helina azaleella* Feng et al. 2004**

Distribution

Sichuan (type-locality: Mount Erlang).

***Helina baoshanensis* Xue and Li, 2000**

Distribution

Yunnan (type-locality: Mount Taibao).

***Helina barkamica* Xie et al., 2008**

Distribution

Yunnan (type-locality: Mount Taibao).

***Helina brachytophalla* Feng, 2004**

Distribution

Sichuan (type-locality: Mount Erlang).

***Helina dianica* Qing and Feng, 2005**

Distribution

Yunnan (type-locality: Deqin).

***Helina emeishanana* Guan et al. 2001**

Distribution

Sichuan (type-locality: Mount Emei).

Helina evecta (Harris, 1780)

Distribution

Jilin, Heilongjiang, Liaoning, Hebei, Shanxi, Gansu, Xinjiang, China; Japan, Russia, Europe (type-locality: England), Israel, Syria, North Africa, Nearctic region, Neotropical region, Afrotropical region, Oriental region.

Helina fica Xue, 1985

Distribution

Shanxi, Hebei, Liaoning (type-locality: Hengren, Benxi), Hubei, Sichuan, Yunnan.

Helina floscula Feng and Xue, 2003

Distribution

Sichuan (type-locality: Hanyuan)

Helina gongshanensis Xue and Li, 2000

Distribution

Yunnan (type-locality: Mount Gong)

Helina jiaodingshanica Feng, 2004

Distribution

Sichuan (type-locality: Hanyuan)

Helina longievecta Xue, sp. nov.
(Figure 2A–D)

Type material

Holotype. One male (IESNU), China, Forestry centre of Guamagou, Ningxia Hui Autonomous Region, 38°28' N, 106°15' E, altitude 2200 m, 6 July 2008, J.Y. Liu.

Paratypes. One male (IESNU), same data as holotype.

Etymology

The specific name is based on the similarity of new species with *Helina evecta* (Harris, 1780), with arista length of the former more than twice width of postpedicel, the latter subequal to the width of postpedicel.

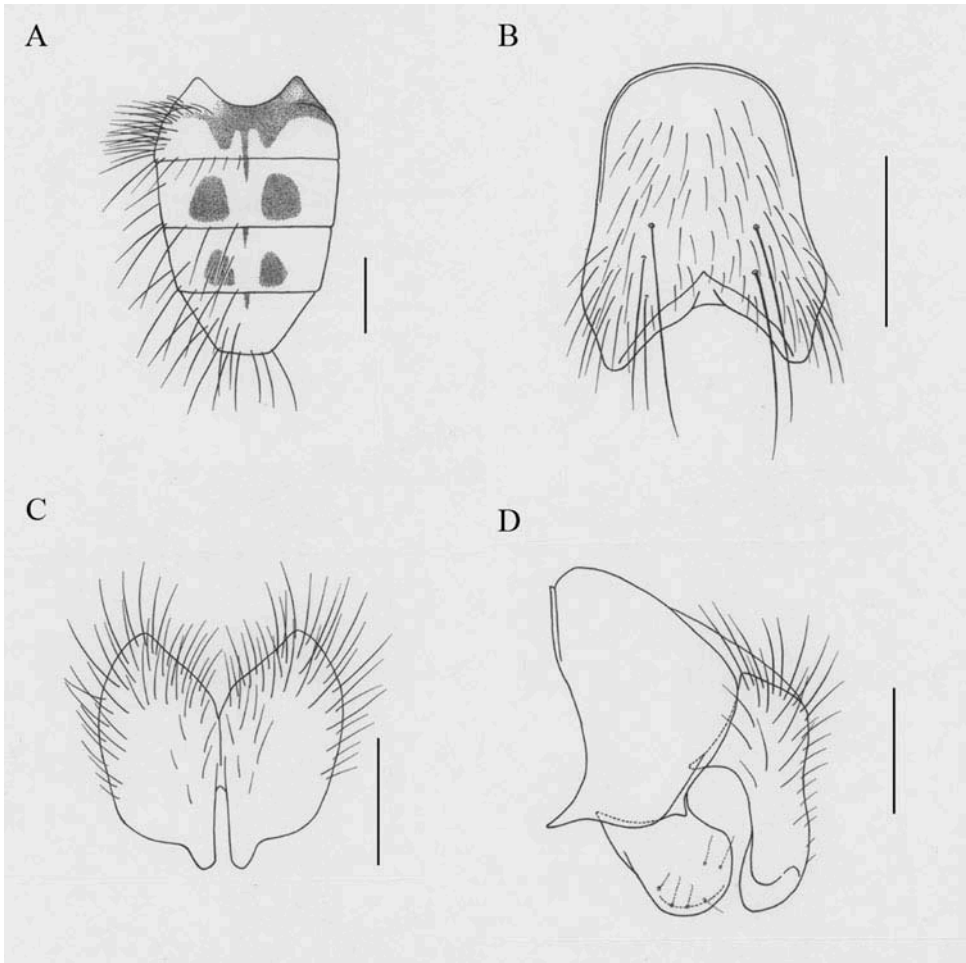


Figure 2. *Helina longievecta* Xue, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B, 0.5 mm; C, D, 0.2 mm.

Distribution

China, Ningxia Hui Autonomous Region, Forestry centre of Guamagou.

Remarks

This new species is similar to *H. evecta* (Harris, 1780), but differs from it as follows: parafacial about 1.2 times as broad as postpedicel; the longest arisal hairs about 2.2–2.5 times as long as the width of postpedicel; cross-veins r-m and dm-cu indistinctly clouded; tergite 5 with a pair of small patches.

Description (based on holotype)

Male. Body length 6.9–7.2 mm.

Head. Eyes with dense, medium long and orange ciliae; frons about twice as broad as anterior ocellus; frontal vitta black, linear at narrowest point; 6–7 pairs of *fr* on lower half of frons, without *ors*; ocellar seta shorter than the lower *fr* length; fronto-orbital plate and parafacial with light grey pruinosity, parafacial about 1.2 times as broad as postpedicel; antenna black, postpedicel thin and long, length about 2.5 times longer than width; arista long plumose, the longest hairs about 2.2–2.5 times as long as the width of postpedicel; lunule brownish; epistoma not prominent; vibrissal angle situated behind frontal angle; anterior margin of gena with one row of upcurved setulae, genal and postgenasetulae black; gena with grey pruinosity, genal height about two-ninths of eye height; epicephalon with black hairs; proboscis short, with grey pruinosity, length about twice as long as its height; labella large, posterior part of labella extended in posterosuperior direction, about four-fifths of prementum length; palpus black, about 1.3 times as long as prementum.

Thorax. Ground-colour black, with light grey pruinosity; scutum with four black vittae, inner vitta reaching the middle of postsutural area of scutum; *acr* 0+1, *dc* 2+4, *ial* 0+2, *pra* about two-fifths to a half of posterior notopleural seta in length, post-humeral seta 1+0; posterior notopleural seta with many setulae around base; lateral surface and ventral lateral margin of scutellum with black hairs; basisternum of prosternum, proepisternum hollow in centre, anepimeron and katepimeron all bare; meron with many black hairs; anterior anepisernal seta 1, katepisternal setae 2+2; anterior and posterior spiracles large and orange.

Wing. With a light orange colour, basicosta yellow; costal spine short, Sc bow-shaped, radial node bare, R_{4+5} and M straight, slightly diverging in distal part, cross-veins r-m and dm-cu indistinctly clouded; calypters yellowish, lower calypter tongue-shaped protruding, haltere yellow.

Legs. Completely black; fore tibia without median *p*; mid femur without distinct *av*, with anterior setiform row in basal half, *pv* row complete, shorter towards apex; mid tibia with 2–3 *p*; hind femur with *av* row complete, distinctly strong towards apex, distinctly short and fine in sub-basal part, only with 2–3 *pv* in apical part; hind tibia with 3–4 *av*, 2 *ad*, posterior setiform row in basal half, without *pv*; tarsi longer than tibiae, claws and pulvilli long and large, subequal to tarsomere 5 in length.

Abdomen. Ground-colour black, oval in dorsal view, with dense and greyish pruinosity; tergites 3–5 each with a pair of black patches; posterior marginal row of setae complete; body hairs dense and short, without shifting patches or with very indistinct shifting patches; patches on tergite 5 small, discal setae longer than posterior marginal setae, sternite 1 with hairs.

Female. Unknown.

Helina longisurstyla Xue and Sun, sp. nov.
(Figure 3A–D)

Type material

Holotype. One male (IESNU), China, Snow Mount Biluo, Yunnan Province, 26° 57' N, 99°01' E, altitude 2300–2400 m, 13 May 2012, Y. Zhao.

Paratypes. One male (IESNU), same data as holotype.

Etymology

The specific name is based on the long male surstylus.

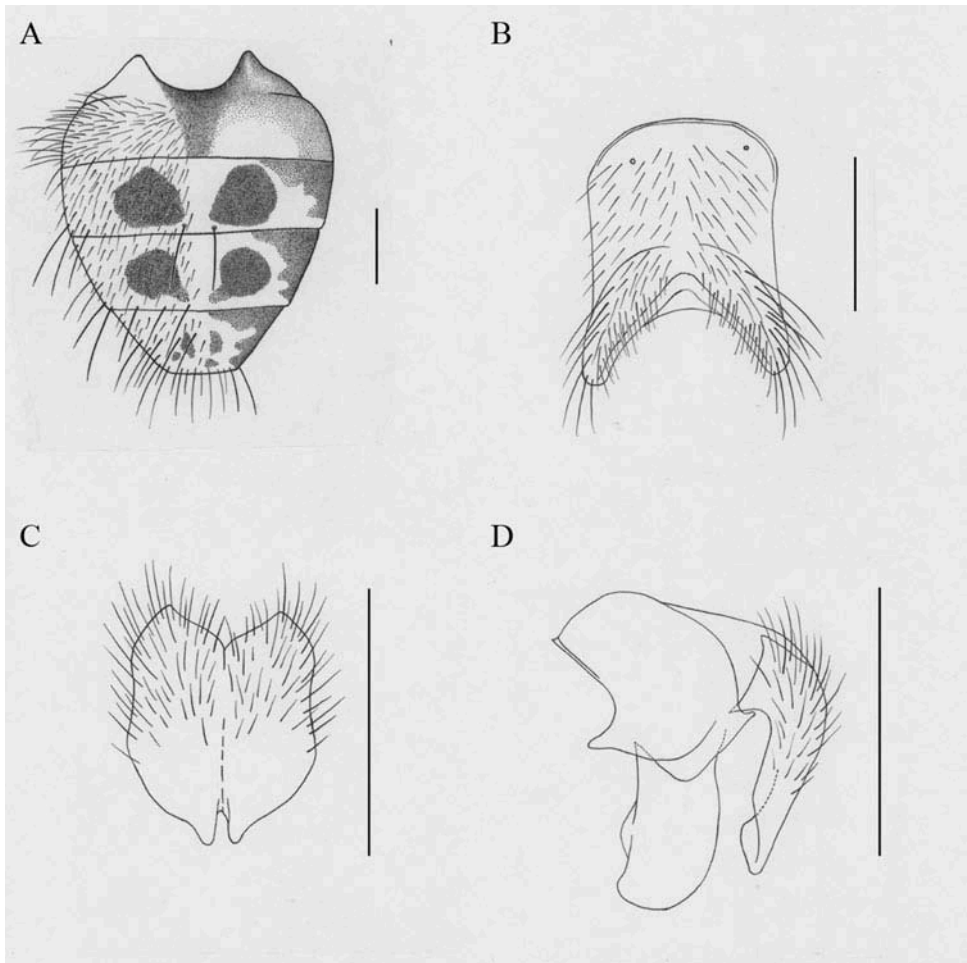


Figure 3. *Helina longisurstyla* Xue and Sun, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B–D, 0.5 mm.

Distribution

China, Yunnan Province, Snow Mount Biluo.

Remarks

This new species is similar to *H. baoshanensis*, but differs from it as follows. Ciliae of eyes shorter; anterosuperior facet distinctly enlarged; frons narrower than anterior ocellus in width; parafacial distinctly narrower than antenna in width; the length of postpedicel about 4.5–4.8 times as long as its width; inner black vitta of scutum broader, not reaching scutoscutellar suture; mid femur with 3–4 *pv*; hind tibia with 5 *av* in medial one-third; inner protuberance of male cercus longer, without outer protuberance; cercus longer in profile view, length about twice as long as width.

Description (based on holotype)

Male. Body length 8.4–8.6 mm.

Head. Eyes with median long and orange hairs, anterosuperior facet enlarged; frons about 1.2 times as broad as anterior ocellus; frontal vitta linear in upper half; 7 pairs of *fr* on lower half of frons; fronto-orbital plate and parafacial with grey pruinosity; fronto-orbital plate subequal to antenna in width; antenna black, the length of postpedicel about 4.5–4.8 times as long as its width; arista long plumose, the longest hairs about 2.5 times as long as the width of postpedicel; genal height about two-ninths of eye height; genal and postgena setulae black; proboscis short; length of prementum about 2.5 times as long as its height; palpus black, longer than prementum.

Thorax. Ground-colour black; scutum with dense and blue grey pruinosity and four black vittae, inner vitta not reaching scutoscutellar suture, about three-fifths width of the median and pale vitta; *acr* 0+1, *dc* 2+4, *pra* about three-fifths length of posterior notopleural seta; notopleuron, meron, lateral surface and ventral lateral margin of scutellum with black hairs; basisternum of prosternum and katepimeron all bare; anterior anepisernal seta 1, katepisternal setae 2+2.

Wing. Transparent, veins orange yellow, basicosta yellow; costal spine absent; dm-cu S-shaped; radial node bare; R_{4+5} and M diverging in distal part; calypters yellowish; haltere yellow.

Legs. Completely black; fore tibia without median *p*; mid femur with *pv* row complete, shorter towards basal half; mid tibia with 3 *p*; hind femur with *av* row in apical one-third, without *pv*; hind tibia with 5 *av*, 2 *ad*, posterior setula row (about 8) in sub-basal to pre-apical, without *pv*.

Abdomen. Ground-colour black, with grey to orange grey pruinosity; sub-circular in dorsal view; tergites 3 and 4 each with a pair of black brown patches; tergite 5 without distinct patches; each tergite without median vitta, with distinct shifting patches; tergite 3 with a pair of median marginal setae; body hairs denser, body

hairs of tergites 4 and 5 sparser; posterior marginal setae of tergite 5 thin and short; terminalia black; sternite 1 with hairs.

Female. Unknown.

***Helina luyashanensis* Wang et al. 1990**

Distribution

Shanxi (type-locality: Mount Luya)

***Helina maae* Xue and Li, 2000**

Distribution

Yunnan (type-locality: Luquan)

***Helina maquensis* Wu, 1989**

Distribution

Gansu (type-locality: Maqu)

***Helina midmargiseta* Xue sp. nov.
(Figure 4A–D)**

Type material

Holotype. One male (IESNU), China, Snow Mount Baimang, Yunnan Province, 28° 18' N, 98°58' E, altitude 4250 m, 26 July 2008, X.D. Fei.

Paratypes. One male (IESNU), same data as holotype.

Etymology

The specific name is based on tergite 5 with a pair of median marginal setae.

Distribution

China, Yunnan Province, Snow Mount Baimang.

Remarks

This new species is similar to *Helina setipostitibia* Wang et al. 2004, but differs from it as follows: frontal vitta about a half width of frons; parafacial about 1.2 times as broad as postpedicel; genal height slightly shorter than one-quarter of eye height; cross-veins r-m and dm-cu not distinctly clouded; fore tibia with 1 median *p*; mid tibia

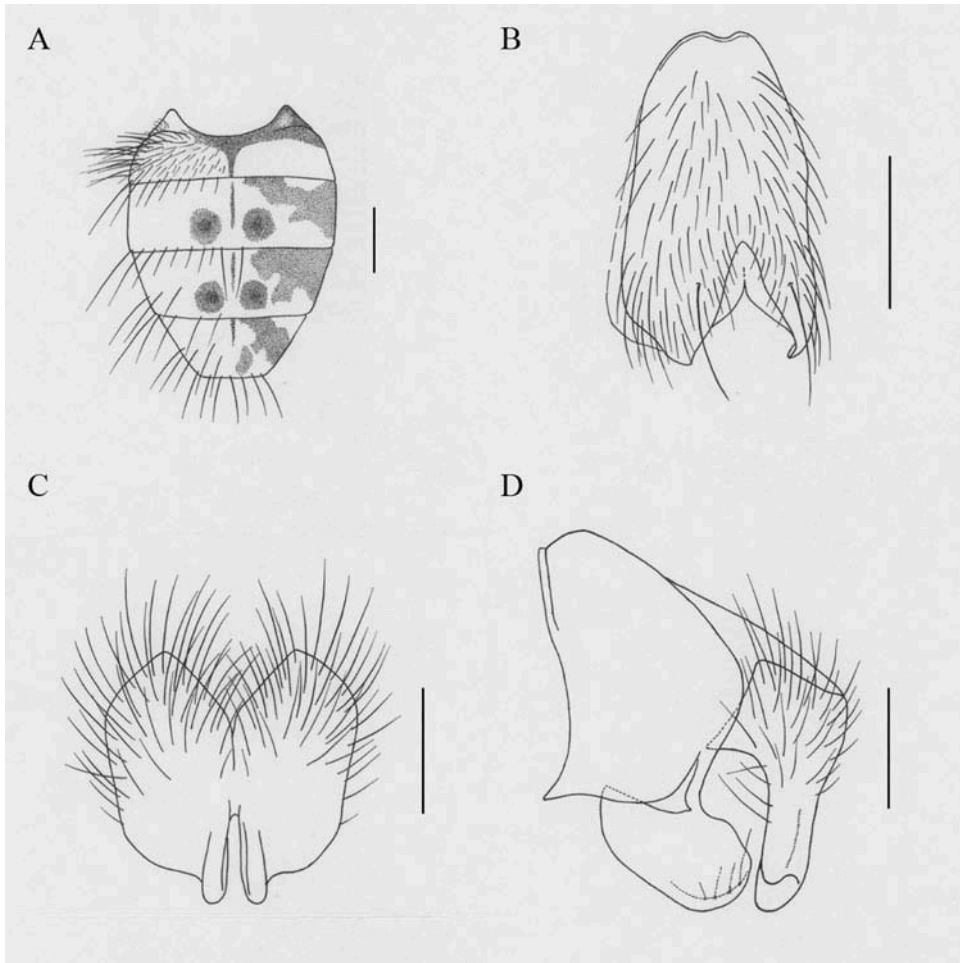


Figure 4. *Helina midmargiseta* Xue, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B, 0.5 mm; C, D, 0.2 mm.

only with 3 *p*, without *ad* and 2 rows of *p*; hind tibia with 4–5 *av*; abdomen oval in dorsal view, patches small.

Description (based on holotype)

Male. Body length 8.3–8.5 mm.

Head. Eyes with sparse ciliae; frons about 1.5–2.0 times as broad as anterior ocellus; interfrontal villi black, the narrowest of frontal vitta about a half width of frons; 6–7 pairs of *fr* on lower three-fifths of frons, without *ors*; ocellar seta strong, subequal to the lower *fr* in length; fronto-orbital plate and parafacial with grey white pruinosity; parafacial about 1.2 times as broad as postpedicel; antenna black, the length of

postpedicel about 3.0 times as long as its width; arista long plumose, the longest hairs about 1.2 times as long as the width of postpedicel; lunule dark orange; epistoma not protruding; vibrissal angle situated behind frontal angle; anterior margin of gena with 1–2 rows of upcurved setae, genal and postgena setulae black; genal height slightly shorter than one-quarter of eye height; epicephalon with minority hairs; prementum with pruinosity, length about twice as long as height; palpus black, about 1.5 times as long as prementum; labella large, subequal to prementum length.

Thorax. Ground-colour black, with steel grey pruinosity; scutum with four black vittae, inner vitta reaching posterior three-quarters of postsutural area of scutum; *acr* 0+1, *dc* 2+4, *ial* 0+2, *pra* about one-half length of posterior notopleural seta, post-humeral seta 1+0; near posterior notopleural seta with many hairs; lateral and lower surfaces bare, basisternum of prosternum, proepisternum hollow in centre, anepimeron and katepimeron all bare, meron with many hairs; anterior anepisernal seta 1, katepisternal setae 1+2; spiracles large and brown.

Wing. With light orange colour, basicosta yellow; costal spine distinct, Sc bow-shaped, radial node bare, R_{4+5} and M straight, diverging in distal part, cross-veins r-m and dm-cu not distinctly clouded; calypters light orange yellowish, lower calypter protruding, haltere yellow.

Legs. Completely black; fore tibia with 1 median *p*; mid femur *av* indistinct, *pv* row complete, shorter towards apex; mid tibia with 3 *p*; hind femur with *av* row in apical half, without *pv*; hind tibia with 4–5 *av*, *ad* 2–3, without *pd*, middle part with posterior setulae row, without *pv* in apical part; tarsi longer than tibiae, claws and pulvilli equal length, about four-fifths of tarsomere 5 length.

Abdomen. Ground-colour black, with dense and greyish pruinosity; oval in dorsal view; tergites 3 and 4 each with a pair of small and black brown patches, margin of the patches slightly integrates with shifting patches; shifting patches on tergites 3–5 large, 2–3 pieces of shifting patches on tergite 5; tergites 2–5 each with 1 median and dark black vitta; tergite 3 with a pair of median marginal setae; posterior marginal setae of tergites 4 and 5 complete; discal setae 1 row; body hairs short and dense; tergite 6 bare; sternite 1 with many short hairs.

Female. Unknown.

Helina mimevecta Feng and Xue, 2003

Distribution

Sichuan (type-locality: Mount Erlang)

Helina mimifica Feng, 2000c

Distribution

Sichuan (type-locality: Mount Erlang)

Helina nemorum (Stein 1915)

Distribution

Sichuan, Yunnan, Taiwan (type-locality: Gaoxiong, Mount Feng); Burma, India.

Helina nigriabdomilis Xue, sp. nov.
(Figure 5A–D)

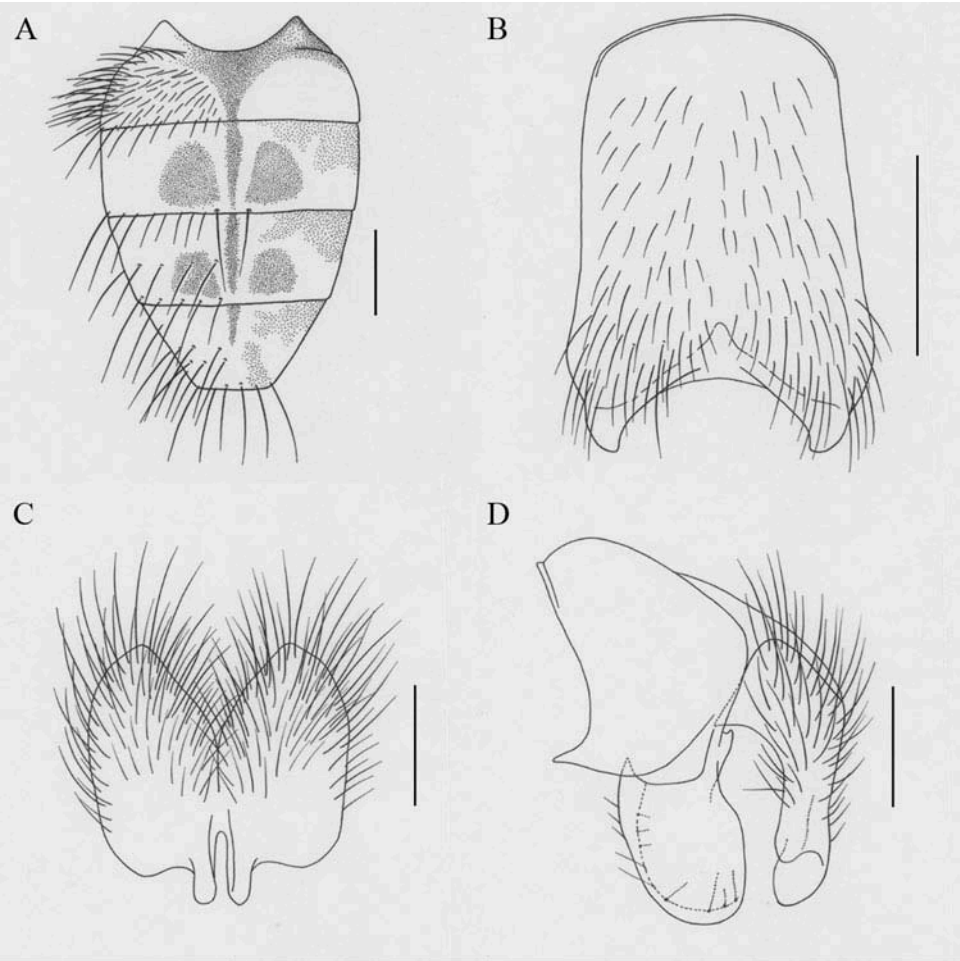


Figure 5. *Helina nigriabdomilis* Xue, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B, 0.5 mm; C, D, 0.2 mm.

Type material

Holotype. One male (IESNU), China, Mount Paoma, Sichuan Province, 30°02' N, 101°57' E, altitude 2600–3000 m, 5 July 2006, J.Y. Liu.

Paratypes. One male (IESNU), same data as holotype.

Etymology

The specific name is based on abdomen with particularly large black patches.

Distribution

China, Sichuan Province, Mount Paoma.

Remarks

This new species is similar to *H. plumipostitibia* Feng and Xue, 2002a, but differs from it as follows: width of frons subequal to postpedicel in width; thorax with a little steel grey pruinosity; costal spine small and short; haltere brown, apex of haltere red orange; fore tibia with 3 *pv* in apical half; mid tibia without *ad*, *p* 5; tergite 5 with a pair of carbonarius patches in posterior half; sternite 5 narrow in basal part, broad in apical part, lateral lobe broad, surstylus shorter, outer protuberance of cercus subequal to inner protuberance in length.

Description (based on holotype)

Male. Body length 8.4–8.6 mm.

Head. Eyes with dense, long and orange hairs, frons subequal to postpedicel in width (about 3.0 times as broad as postpedicel); frontal vitta villi black, about 1.5–2.0 times as broad as anterior ocellus (about 2.0–2.5 times as broad as frons); *fr* 7–8 pairs on lower three-fifths of frons, with hairs in the middle; ocellar seta strong, longer than the longest *fr*; fronto-orbital plate with dark orange pruinosity, parafacial with orange grey pruinosity; parafacial with silver flash patches in the pedicel level, about 1.5 times as broad as the middle part of antenna; antenna black; postpedicel broad towards apex, length about 3.0–3.5 times middle width; arista plumose, upper slightly longer than lower, subequal to or slightly longer than the middle part of antenna; lunule dark red; epistoma not protruding; vibrissal angle situated behind frontal angle; anterior margin of gena with 2–3 rows of upcurved setulae, genal and postgenal setulae black; gena with dark grey pruinosity, genal height about one-half of eye height; occiput with dark grey pruinosity, epicephalon with black hairs; prementum with dense and steel grey pruinosity, length about 2.2 times as long as height; labella large, posterior of labella extended in upward direction, distinctly longer than prementum; palpus black, about 1.2 times as long as prementum.

Thorax. Ground-colour black; arthropleuron with some steel grey pruinosity; scutum with slight orange grey pruinosity, with slight dark blue metal reflection, with 4 carbonarius pruinose vittae, the inner vitta reaching the middle of the postsutural area of scutum; *prst acr* about 4 rows, only a pair of *acr* distinct near scutoscutellar suture, *dc* 2+4, *ial* 0+2, *pra* hair-like, about three-fifths length of posterior notopleural seta, postpronotal setae 3, posthumeral seta 1+0; posterior notopleural setae with hairs around base; basal and apical scutellar setae strong, lateral scutellar setae 2 pairs, lateral surface of scutellum with hairs, ventral surface bare; basisternum of prosternum, proepisternum hollow in centre, anepimeron and katepimeron all bare; meron with many fine hairs; anterior anepisernal seta 1, anepisernal seta row without hairs between the first and the second, among other setae with fine hairs; katepisternal setae 2+2; anterior and posterior spiracles larger and dark brown; anatergite with orange hairs; greater ampulla bare.

Wing. Wing-base brown, basicosta yellow; subcostal sclerite with short and black hairs, costal spine small and short; Sc bow-shaped; radial node bare; R_{4+5} and M straight, slightly diverging in distal part; cross-veins r-m and dm-cu distinctly clouded; calypter light orange, the lower calypter tongue-shaped protruding, margin of calypter orange, haltere brown, apex of haltere red orange.

Legs. Completely black; fore tibia with 3 *pv* in apical half; mid femur without distinct *av*, *pv* row complete, shorter towards apex, setae hair-like in apical half, 7–8 strong in basal part; mid tibia without *ad*, *p* 5, 2 of them slightly partial rear, all strong, the longest about one-third of the length of mid tibia; hind femur with 5–6 *ad* in apical one-third, without distinct *pv*; hind tibia with 1 row of pectinate *av* (about 8–9) in apical two-thirds, most of setae about 2.5–2.7 times as long as the diameter of hind tibia, *ad* 4, all strong, 1 median *ad* about one-third of hind tibia in length, without *pd*, 9–10 *pv* in apical two-thirds, 2–3 of *pv* setiform in super-medial, elongate towards apex, 1 *d* in pre-apical part, without *pv* in apical part; tarsi longer than tibiae, claws and pulvilli long, about 1.4 times as long as tarsomere 5, claws and pulvilli of fore and middle legs slightly short, subequal to the length of tarsomere 5.

Abdomen. Oval in dorsal view, ground-colour black, body hairs denser; most parts of tergites 1+2 black, tergites 3 to 5 with median and black vittae in anterior half, tergite 5 with a pair of carbonarius patches in posterior half, black patch on tergite 4 subquadrate, black patch on tergite 3 broad, width about 1.2 times length; tergites 3 to 5 posterior marginal setae complete, tergite 5 with 3–4 pairs of discal setae, tergite 4 with 2–3 pairs of discal setae, ventral surface of tergite 5 posterior marginal setae strong, cruciate in apical of terminalia; lateral of tergites 2 to 4 with a little grey pruinosity, slightly discoloured; sternite 1 with hairs, sternite 5 narrow in basal part, broad in apical part, lateral lobe broad, terminalia small, surstylus shorter, outer protuberance of cercus subequal to inner protuberance in length.

Female. Unknown.

Helina nigriannosa Xue et al. 1989

Distribution

Hebei, Shanxi, Liaoning (type-locality: Benxi), Jilin.

Helina nivimonta Xue, sp. nov.

(Figure 6A–D)

Type material

Holotype. One male (IESNU), China, Snow Mount Baimang, Yunnan Province, 28° 18' N, 98°58' E, altitude 4250 m, 26 July 2008, X.D. Fei.

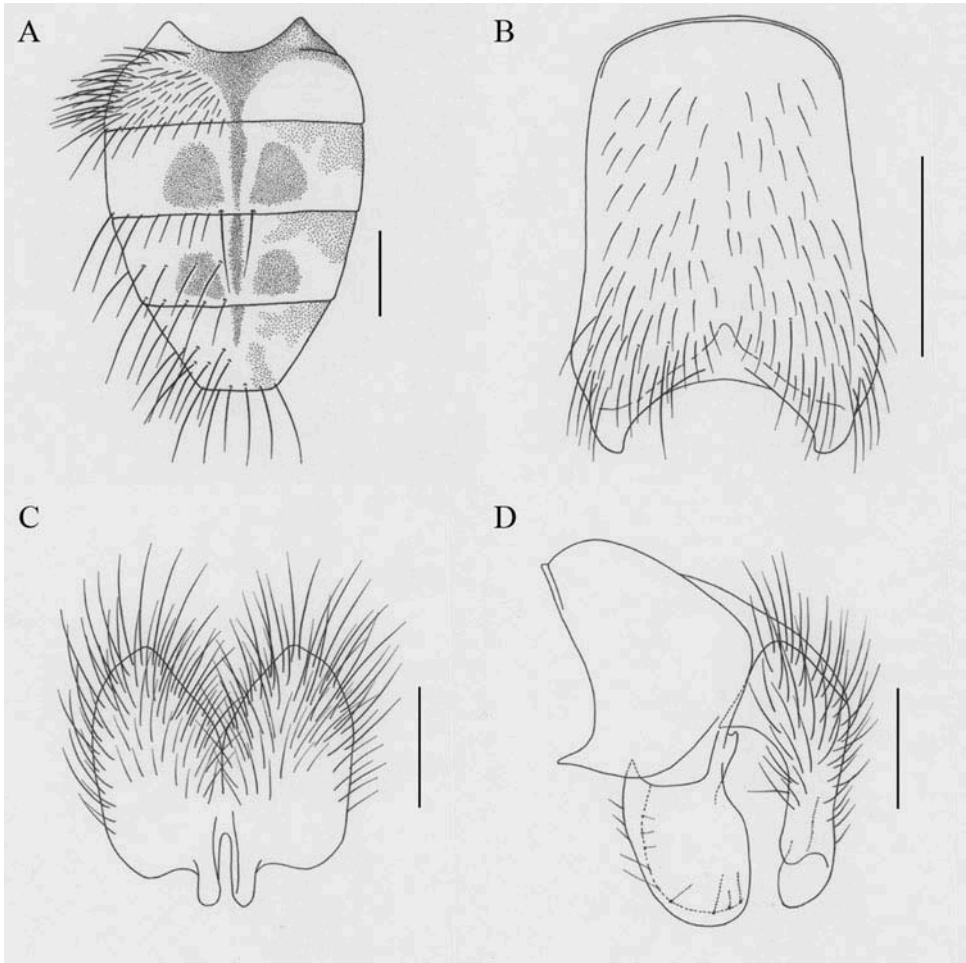


Figure 6. *Helina nivimonta* Xue, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B, 0.5 mm; C, D, 0.2 mm.

Paratypes. One male (IESNU), same data as holotype.

Etymology

The specific name is based on the habitat of the new species, which is a snow-covered plateau; species was collected on the meadow.

Distribution

China, Yunnan Province, Snow Mount Baimang.

Remarks

This new species is similar to *H. mae* Xue and Li, 2000, but differs from it as follows: eyes with sparse and short ciliae; the longest hairs subequal to the width of postpedicel; cross-vein r-m without distinct cloud; fore tibia with median *p*, 2 *pv*; hind tibia with 3 *ad*; inner protuberance of male cercus longer.

Description (based on holotype)

Male. Body length 8.4–8.6 mm.

Head. Eyes with sparse and short ciliae; frons about 1.0–1.5 times as broad as anterior ocellus; fronto-orbital plate adjoin; frontal vitta black; *fr* 7–8 pairs on lower three-fifths of frons, without *ors*; ocellar seta strong, about four-fifths length of *fr*; fronto-orbital plate and parafacial with grey white pruinosity, parafacial about 1.2 times as broad as postpedicel; antenna black; length of postpedicel about 3.3–3.6 times longer than its width; arista plumose, the longest hairs subequal to the width of postpedicel; lunule dark orange; epistoma not protruding; vibrissal angle situated behind frontal angle; anterior margin of gena with 1–2 rows of upcurved setae; genal and postgenal setulae black; genal height about one-fifth of eye height; epicephalon with hairs; prementum with pruinosity, length about twice as long as height; palpus black, thin and long, about 1.3 times as long as prementum; labella large, both margins of labellum with many rows of dentes, subequal to prementum length.

Thorax. Ground-colour black, with grey to orange grey pruinosity; scutum with four black vittae, inner vitta narrower, about a half width of the middle pale pruinose vitta, reaching the middle of postsutural area of scutum; *acr* 0+1, *dc* 2+4, *ial* 0+2, *pra* about three-quarters length of posterior notopleural seta, near posterior notopleural seta with many hairs; lateral surface and ventral lateral margin of scutellum with black hairs; basisternum of prosternum, proepisternum hollow in centre, anepimeron and katepimeron all bare; meron with hairs; anterior anepisternal seta 1, katepisternal setae 2+2; anterior and posterior spiracles large and brown.

Wing. With a light orange colour, basicosta orange yellow; costal spine short, Sc bow-shaped, radial node bare, R₄₊₅ and M straight, slightly diverging in distal part, cross-veins r-m and dm-cu not clouded; dm-cu S-shaped curved; calypters yellowish, lower calypter protruding, haltere orange yellow.

Legs. Completely black; fore tibia without *ad*, with 1 median *p*; mid femur without distinct *av*, with 4–5 strong *pv* in basal half; mid tibia with 3 shorter *p*, 2 strong *pv*; hind femur with 4–5 *av* in apical one-third, 2 of them strong, the longest about 1.5 times as long as the diameter of hind femur, without *pv*; hind tibia with 5 *av*, 3 *ad*, without *pd* in sub-basal part, with 1 row of setulae (about 7–9) in medial part, without *pv* in apical part; tarsi longer than tibiae, claws and pulvilli long and large, subequal to tarsomere 5 length.

Abdomen. Ground-colour black, oval in dorsal view, with dense and yellow grey pruinosity; tergites 3 and 4 each with a pair of dark brown patches; the middle of tergites 3 to 5 each with 1 broader and dark grey pruinose vitta (not the median, narrow and black vitta); tergites 3–5 with shifting patches, tergite 5 with 2–3 shifting patches; discal setae 2 rows, about 8 pairs; tergite 4 with 1 row of discal setae, about 4 pairs; tergites 4 and 5 with complete posterior marginal setae; tergite 3 with a pair of strong median marginal setae; body hairs of tergites 2 and 3 dense and short; tergite 6 bare; sternite 1 with hairs.

Female. Unknown.

Helina pedana Feng, 2007

Distribution

Sichuan (type-locality: Yaan)

Helina platycephala Feng, 2000a

Distribution

Sichuan (type-locality: Mount Erlang)

Helina pleuranthus Wu, Fang and Fan, 1988

Distribution

Shaanxi (type-locality: Ziwuling)

Helina plumipostitibia Feng and Xue, 2002a

Distribution

Sichuan (type-locality: Yaan)

Helina quadratisterna Xue and Wang, 1989

Distribution

Shanxi (type-locality: Youyu)

Helina sarmentosa Fang and Fan, 1993

Distribution

Yunnan (type-locality: Snow Mount Meili)

Helina septentrionalis Xue and Cui, 2003

Distribution

Heilongjiang (type-locality: Wuying)

Helina setipostitibia Wang et al. 2004

Distribution

Tibet (type-locality: Mount Duoxiongla)

Helina setosiannosa Xue, sp. nov.
(Figure 7A–D)

Type material

Holotype. One male (IESNU), China, Mount Emei, Sichuan Province, 29°36' N, 103° 29' E, altitude 800–1000 m, 8 April 1957, K.R. Huang.

Paratypes. One male (IESNU), China, Mount Emei, Sichuan Province, 29°36' N, 103°29' E, altitude 550–750 m, 29 March 1957, K.R. Huang.

Etymology

The specific name is based on the new species having more setae than *H. annosa*.

Distribution

China, Sichuan Province, Mount Emei.

Remarks

This new species is similar to *H. nemorum* (Stein 1915), but differs from it as follows: arista long plumose, the longest hairs at least 1.5 times as long as the width of postpedicel; cross-vein r-m clouded; hind tibia with 6 *ad*; abdomen with shifting patches, sternite 1 with hairs.

Description (based on holotype)

Male. Body length 7.5–8.0 mm.

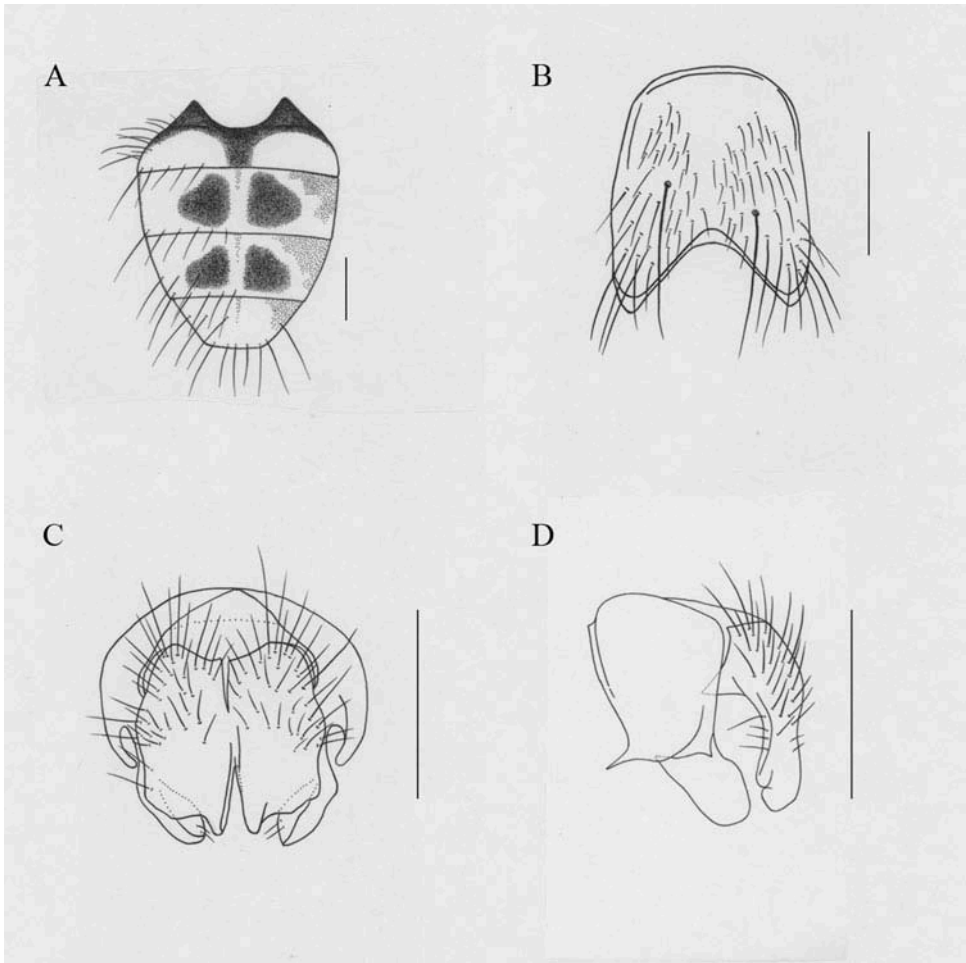


Figure 7. *Helina setosiannosa* Xue, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B–D, 0.5 mm.

Head. Eyes with dense and medium long ciliae, the longest cilia equal to the width of postpedicel; the narrowest of frons at least equal to anterior ocellus width; fronto-orbital plate adjoin in the middle; *fr* 8 pairs on lower half of frons; fronto-orbital plate, parafacial and gena with orange grey pruinosity; parafacial about 1.3 times as broad as postpedicel; antenna black, the length of postpedicel about 4.0 times as long as its width, arista long plumose, the longest hairs at least 1.5 times as long as the width of postpedicel; epistoma not protruding; vibrissal angle situated behind frontal angle; genal height about two-ninths to one-quarter of eye height; anterior margin of gena with 2 rows of upcurved setae; genal and postgenal setulae black; proboscis with pruinosity; length of prementum about twice as long as height; palpus black, longer than prementum.

Thorax. Ground-colour black, with orange grey pruinosity; scutum with 4 distinct black vittae, inner vitta reaching scutoscutellar suture, dorsal surface of scutellum with 1 distinct black vitta, about twice as broad as inner vitta of scutum; *acr* 0+1, *dc* 2+4, *ial* 0+2, *pra* distinct, about a half to two-thirds length of posterior notopleural seta, notopleuron with hairs around posterior notopleural setae, lateral surface and ventral lateral margin of scutellum with black hairs, basisternum of prosternum and katepimeron all bare, meron with hairs; katepisternal setae 1 (2) +2.

Wing. Transparent, veins brown, basicosta orange yellow, costal spine indistinct, radial node bare, R_{4+5} and M straight, cross-vein r-m slightly clouded; calypters yellowish, haltere yellow.

Legs. Completely black; fore tibia without median *p*; mid femur with *pv* row complete, short and thin towards apex; mid tibia with 4 *p*; hind femur with *av* row complete, strong in apical half, the longest hairs about twice as long as the diameter of hind femur, without *pv*; middle part of hind tibia with 5–7 longer *av*, 7–8 *ad* in apical two-thirds, 1 row of longer and pectinate *pv* (about 7–8) in basal four-fifths; tarsi longer than tibiae, claws and pulvilli medium long.

Abdomen. Ground-colour black, oval in dorsal view, with grey white pruinosity and shifting patches; tergites 3 and 4 each with a pair of subtrigonal and brown patches, tergites 3–5 without distinct median vittae, sternite 1 with hairs.

Female. Unknown.

Helina shii Xue, sp. nov.
(Figure 8A–H)

Type material

Holotype. One male (Museum of Hebei University), China, Kowloon HongBa, Sichuan Province, 29°13' N, 102°02' E, altitude 2150 m, 25 April 2008, M.F. Shi.

Paratypes. One male (Museum of Hebei University), same data as holotype.

Etymology

The specific name is based on the name of the collector, Mr Shi Mingfu, with thanks for providing this specimen.

Distribution

China, Sichuan Province, Kowloon HongBa.

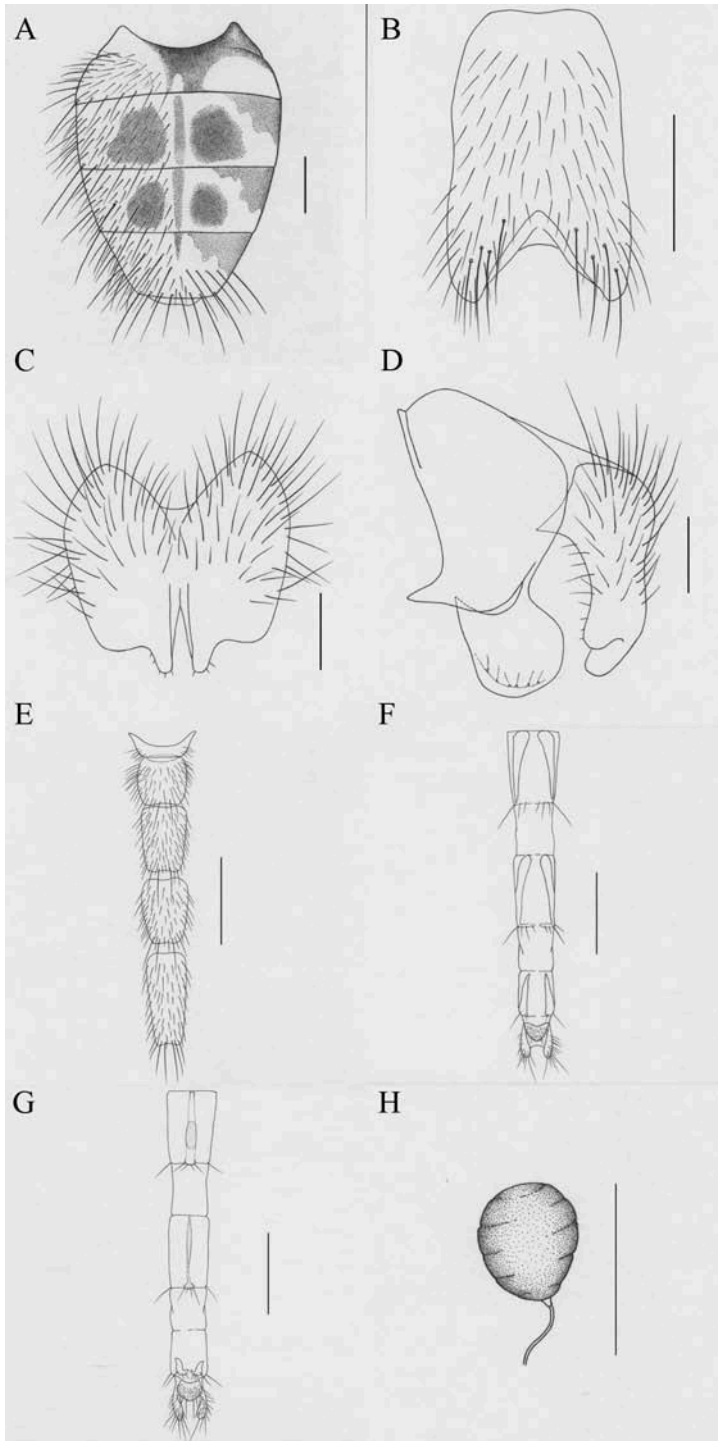


Figure 8. *Helina shii* Xue, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile; (E) female, sternites 1–5 in ventral view; (F) female, ovipositor in dorsal view; (G) female, ovipositor in ventral view; (H) female, spermatheca. Scale bars: A, E–G, 1 mm; B, 0.5 mm; C, D, H, 0.2 mm.

Remarks

This new species is similar to *H. plumipostitibia* Feng and Xue, 2002a, but differs from it as follows: hairs of eyes slightly sparse; *fr* 5 pairs on lower two-fifths of frons; parafacial slightly broader than antenna width; lateral surface and ventral lateral margin scutellum with black hairs; mid tibia except for *p* in medial, with 1–2 *pv*; tergite 2 without coupled small patches, sternite 5 thinner and longer; cercus sub-square in posterior view, lateral margin straight, outer protuberance distinct, broader in profile view; surstylus shorter.

Description (based on holotype)

Male. Body length 9.6–9.8 mm.

Head. Eyes with sparse and median long ciliae; frons equal to or larger than anterior ocellus in width; fronto-orbital plates adjoin in medial part, triangle in lower half; frontal vitta black; *fr* 5 pairs on lower two-fifths of frons, among the setae with short hairs, without *ors*; inner and outer vertical setae thin, shorter than ocellar seta; fronto-orbital plate and parafacial with copper grey pruinosity, parafacial slightly broader than antenna width; antenna black; length of postpedicel about 3.0 times longer than its width; arista plumose, the longest hairs about 1.0–1.2 times as long as the width of postpedicel; lunule orange; epistoma not protruding; anterior margin of gena with 3–4 rows of upcurved setae; genal height about two-sevenths of eye height; genal and postgena setulae black; dorsal part of occiput with hairs; prementum with pruinosity, length about 2.5 times as long as height; labella large, length about twice as long as the height of prementum; palpus black, longer than the prementum.

Thorax. Ground-colour black, with orange grey pruinosity; scutum with four black vittae, inner vitta reaching the middle of postsutural area of scutum, the middle pale pruinose vitta about 1.5 times as broad as the inner vitta; *acr* 0+1, *prst* *acr* 6–7 rows, *dc* 2+4, *ial* 0+2, *pra* about one-half length of posterior notopleural seta, posterior notopleural seta with many short hairs around base, without outer posthumeral setae; lateral surface and ventral lateral margin of scutellum with black hairs; basisternum of prosternum, proepisternum hollow in centre, anepimeron and katepimeron all bare; lower the posterior spiracle of meron with many short hairs; katepisternal setae 2+2; anterior and posterior spiracles large and dark brown.

Wing. Slightly transparent and orange, basicosta yellow; costal spine absent; ventral surface of costa with hairs, other veins bare; Sc bow-shaped; cross-vein r-m clouded, anterior part of r-m slightly curved outward; R₄₊₅ and M diverging in distal part; calypters yellowish, lower calypter tongue-shaped protruding, haltere yellow.

Legs. Completely black; fore tibia with 1 median *p*; mid femur without distinct *av*, with 4–5 strong *pv* in basal half; mid tibia without *ad*, *p* 4–5, with 1–2 *pv* in medial part; hind femur with 3–4 *av* in apical one-quarter, without *pv*; hind tibia slightly curved in medial part, with 1 lodging *av* row (about 7–8) and 1 row of lodging *pv* (about 7–8) in apical two-fifths, most of them about 1.2–1.3 times as long as the diameter of hind femur, without *pv* in apical part, *ad* 4, without *pd*; tarsi longer

than tibiae, claws and pulvilli developed, subequal to or longer than tarsomere 5 length.

Abdomen. Oval in dorsal view, ground-colour black, with grey pruinosity; tergites 3–5 each with 1 median and dark orange vitta, both sides with distinct shifting patches; tergites 3 and 4 each with a pair of large and black brown patches; posterior marginal setae of each tergite and discal setae of tergite 5 all strong; sternite 1 with hairs, terminalia smaller.

Female. Frons about one-third of head in width; frontal triangle reaching the anterior margin of frons; frontal vitta about 4.0 times as broad as frons; *fr* 4, upper orbital setae 2, inner vertical seta slightly strong, longer than ocellar seta, ciliae of eye slightly short; genal height about one-third of eye height; mid tibia with 2 *p*, slightly short; hind tibia with 2–3 *av* in apical half, *ad* 3–4, without distinct *pv*, other external characteristics same to male.

Helina shuensis Feng, 2000a

Distribution

Sichuan (type-locality: Mount Erlang)

Helina sichuanica Feng, 2005

Distribution

Sichuan (type-locality: Mount Erlang)

Helina sinoccidentala Feng, 2005

Distribution

Sichuan (type-locality: Mount Erlang)

Helina subvecta Xue and Feng, 2002

Distribution

Sichuan (type-locality: Yaan)

Helina subfica Feng, 2005

Distribution

Sichuan (type-locality: Mount Erlang)

Helina subfloscula Xue, sp. nov.
(Figure 9A–D)

Type material

Holotype. One male (IESNU), China, Mount Jiajin, Sichuan Province, 30°20' N, 102° 25' E, altitude 4000–4100 m, 4 August 2008, L. Chang.

Paratypes. Nine males (IESNU), Mount Jiajin, Sichuan Province, 30°20' N, 102° 25' E, altitude 4000–4100 m, 4 August 2008, L. Chang; One male (IESNU), China, Mount Balang, Sichuan Province, 30°39' N, 104°04' E, altitude 4300–4600 m, 3 August 2008, J.Y. Liu.

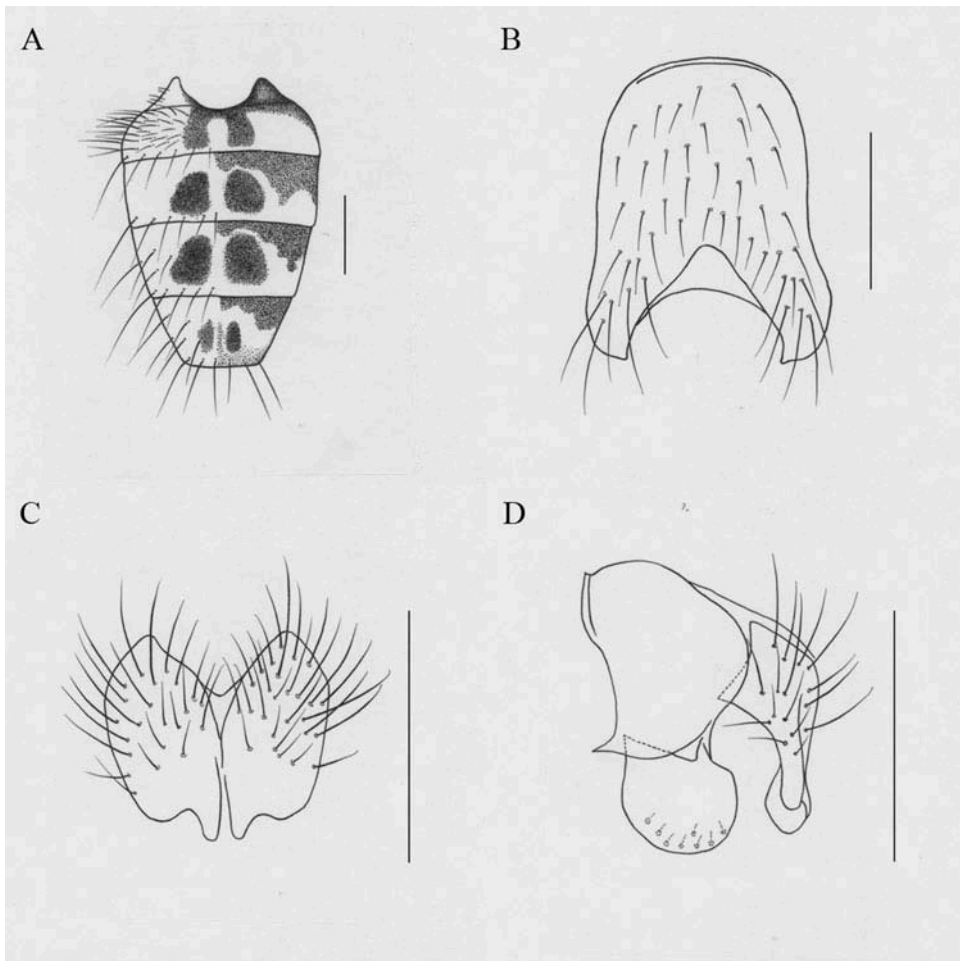


Figure 9. *Helina subfloscula* Xue, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B–D, 0.5 mm.

Etymology

The specific name is based on the similarity of the new species to *H. floscula* Feng and Xue, 2003.

Distribution

China, Sichuan Province, Mount Jiabin, Mount Balang.

Remarks

This new species is similar to *H. floscula* Feng and Xue, 2003, but differs from it as follows. Mid tibia with 1 *ad*; hind tibia with 1 *pd* in sub-basal part; sternite 5 longer; cercus sub-square in posterior view, not triangle; outer protuberance distinct, anterior margin of inner protuberance intumescent in profile view.

Description (based on holotype)

Male. Body length 6.5–7.8 mm.

Head. Eyes with long ciliae; frons broad, slightly narrower than the distance between outer margin of posterior ocellus; frontal vitta slightly broader than frons width; 6 pairs of *fr* on lower three-fifths of frons, without *ors*; fronto-orbital plate, parafacial and gena with grey pruinosity; parafacia about 1.5 times as broad as postpedicel; antenna black, the length of postpedicel about 2.5 times as long as its width; arista plumose, the longest hairs subequal to the width of postpedicel; epistoma not protruding; vibrissal angle situated behind frontal angle; genal height about one-third of eye height; genal and postgena setulae black; anterior margin of gena with 2 rows of upcurved subvibrissal setula; proboscis short; length of prementum about 2.5 times as long as height; palpus black, longer than prementum.

Thorax. Ground-colour black, with grey pruinosity; scutum with four black vittae, inner vitta reaching scutoscutellar suture, the median pruinose vitta subequal to the width of inner vitta; *acr* 6–8 rows, only a pair of *acr* distinct near scutoscutellar suture, *acr* 0+1, *dc* 2+4, *ial* 0+2, *pra* absent; notopleuron with hairs; colour of scutellum the same as thorax, lateral and lower surfaces of scutellum bare, basisternum of prosternum, katepimeron all bare; lower the posterior spiracle of meron with hairs; katepisternal setae 2+2.

Wing. Slightly with a brown colour, wing-base brown, basicosta orange yellow; costal short, Sc bow-shaped, R₄₊₅ and M straight, cross-veins r-m and dm-cu distinctly clouded; calypters yellow, haltere dark orange.

Legs. Completely black; fore tibia without median *p*; mid femur *av* hair-like, 1 row of pectinate and truncated *pv* in basal two-fifths; mid tibia with 1 *ad*, 4–5 *p* in apical two-thirds, the longest about one-quarter of the diameter of mid tibia; hind femur with distinct *av* row in apical one-third, without *pv*; hind tibia with 9–10 pectinate *av* in apical two-thirds, *ad* 3–4, 3 of them strong, the longest about one-third length of

hind tibia, 1 row of pectinate *p* (about 7–8) in apical three-fifths; tarsi longer than tibiae, claws and pulvilli developed.

Abdomen. Ground-colour black, oval in dorsal view; both sides of abdomen with silver grey pruinosity, dorsal surface with orange pruinosity; tergites 2–5 each with a pair of large black patches; tergites 3 and 4 lateral patches minority and slightly confluent; tergite 5 patches minority and indistinct; sternite 1 with hairs.

Female. Unknown.

Helina subnigriabdomilis Xue and Sun, sp. nov.
(Figure 10A–D)

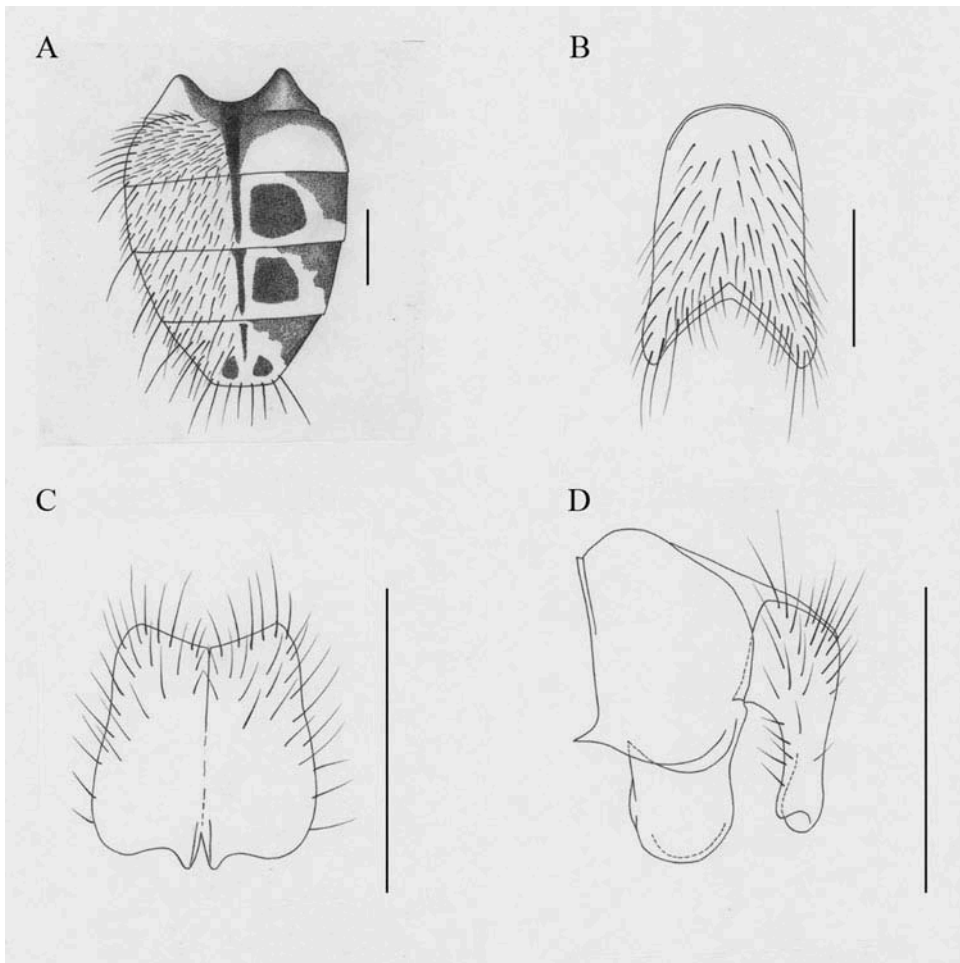


Figure 10. *Helina subnigriabdomilis* Xue and Sun, sp. nov. (A) Male, abdomen in dorsal view; (B) male, sternite 5 in ventral view; (C) male, cerci in posterior view; (D) male, terminalia in profile. Scale bars: A, 1 mm; B–D, 0.5 mm.

Type material

Holotype. One male (IESNU), China, Snow Mount Meili, Yunnan Province, 28° 30' N, 98°39' E, altitude 2900 m, 31 May 2013, X. Zhang

Paratypes. One male (IESNU), same data as holotype.

Etymology

The specific name is based on the similarity of the new species to *H. nigriabdomilis* Xue and Wang.

Distribution

China, Yunnan Province, Snow Mount Meili.

Remarks

This new species is similar to *H. nigriabdomilis* Xue and Wang, but differs from it as follows. Frons narrower than postpedicel in width, about 1.2–1.5 times as broad as anterior ocellus; 5–6 pairs of *fr* on lower two-fifths of frons; ocellar seta strong, about five-sixths length of lower *fr*; fronto-orbital plate and parafacial with brown pruinosity; arista long plumose, most of hairs about 1.2 times as long as antenna width; genal height about three-quarters of eye height; labella shorter than four-fifths length of prementum; *prst acr* 8–10 rows; ventral lateral margin of scutellum with black hairs; subcostal sclerite with orange hairs; margin of calypter yellow; *dm-cu* not distinctly clouded; haltere yellow. Fore tibia without *p* and *pv*; mid tibia with 6 pectinate *p*, about 2.2 times as long as the diameter of mid tibia; hind femur with 9–10 *av* in apical three-quarters; hind tibia with 9–10 *av* in basal two-thirds, shorter towards apex, 6–7 *ad* in apical three-fifths, about 2.5–2.7 times as long as the diameter of hind tibia; tarsi distinctly longer than tibiae; tergite 2 not black, middle part with black vitta; tergites 3–5 with distinct shifting patches; sternite 1 bare; lateral lobe of sternite 5 narrower; distal of cercus broader than basal, outer protuberance distinctly intumescent.

Description (based on holotype)

Male. Body length 8.0–8.4 mm.

Head. Eyes with dense, long and orange hairs; frons narrower than postpedicel in width, about 1.2–1.5 times as broad as anterior ocellus; frontal vitta black; 5–6 pairs of *fr* on lower two-fifths of frons, without *ors*; ocellar seta strong, about five-sixths length of lower *fr*; fronto-orbital plate and parafacial with brown pruinosity; middle part of parafacial subequal to antenna width; antenna black, postpedicel thin and long, length about 3.8–4.0 times as long as median width; arista long plumose, most of hairs about 1.2 times as long as antenna width, upper more than lower; lunule dark brown; epistoma not protruding; vibrissal angle situated behind frontal angle; anterior margin of gena with 2 rows of upcurved setulae, genal and postgena setulae

black; gena with dark grey pruinosity; genal height about three-quarters of eye height; occiput with dark grey pruinosity; epicephalon with black hairs; prementum with dense and dark grey pruinosity, length about 2.2 times as long as height; labella larger, posterior part extended in upward direction, shorter than four-fifths length of prementum; palpus black, about 1.2 times as long as prementum;

Thorax. Ground-colour black; pleura with dark grey pruinosity; scutum with dense and orange grey pruinosity and 4 dark black pruinose vittae, inner vitta reaching the posterior of postsutural area of scutum; *prst acr* 8–10 rows, only a pair of *acr* strong near scutoscutellar suture; *dc* 2+4, *ial* 0+2, *pra* long and setiform, about three-fifths length of posterior notopleural seta, postpronotal setae 3, posthumeral seta 1+0; posterior notopleural seta with hairs around base; basal and apical scutellar setae strong, lateral scutellar setae 2 pairs, lateral surface and ventral lateral margin of scutellum with black hairs; basisternum of prosternum, proepisternum hollow in centre, anepimeron and katepimeron all bare, meron with thin hairs; anterior anepisternal seta 1; anepisternal setae without hairs between the first and the second, among the other setae with thin hairs; katepisternal setae 2+2; anterior and posterior spiracles larger and dark brown; anatergite with orange black hairs; greater ampulla bare.

Wing. With a brownish colour, basicosta yellow, subcostal sclerite with orange hairs; costal spine short, Sc bow-shaped, radial node bare, R_{4+5} and M straight, diverging in distal part; cross-vein r-m distinctly clouded; calypters light orange, lower calypter tongue-shaped protruding, margin of calypter yellow, haltere yellow.

Legs. Completely black; fore tibia without *p* and *pv*; mid femur *av* indistinct, with *pv* row complete, shorter towards apex, 6–7 strong in basal half; mid tibia without *ad*, pectinate *p* 6, about 2.2 times as long as the diameter of mid tibia; hind femur with 9–10 *av* in apical three-quarters, without *pv*; hind tibia with 9–10 *av* in basal two-thirds, shorter towards apex, most of setae about 2.5–2.7 times as long as the diameter of hind tibia, median long *ad* row (about 7) in apical three-fifths, about 2.5–2.7 times as long as the diameter of hind tibia, without *pd*, 8–9 *pv* in basal two-thirds, shorter towards apex, 1 *d* in pre-apical part, without *pv* in apical part; tarsi distinctly longer than tibiae, claws and pulvilli of fore leg about 1.5 times as long as the tarsomere 5, claws and pulvilli of middle and hind legs about 1.2 times as long as the tarsomere 5.

Abdomen. Ground-colour black, with greyish pruinosity; oval in dorsal view; tergite 2 grey, tergites 2–5 with median, narrow and black vitta; tergites 3–5 each with a pair of black patches and shifting patches, lateral patches on tergite 5 smaller, outline indistinct; discal setae 2 rows; body hairs of tergite 2 denser, body hairs of each posterior tergite gradually sparse; posterior marginal setae of middle part of tergite 2 shorten; sternite 1 bare; posterior marginal setae of sternites 2–4 longer; lateral lobe of sternite 5 narrower; distal of cercus broader than basal, outer protuberance distinctly intumescent.

Female. Unknown.

Helina tuomuerra Xue, 2001*Distribution*

Xinjiang (type-locality: Jengish Chokusu) *Helina xinanana* Feng, 2000b

Distribution

Sichuan (type-locality: Mount Erlang)

Geolocation information

Point (*Helina longievecta*): 38°28' N, 106°15' E; Point (*Helana longisurstyla*): 26°57' N, 99°01' E; Point (*Helina midmargiseta*): 28°18' N, 98°58' E; Point (*Helina nigriabdomilis*): 30°02' N, 101°57' E; Point (*Helina nivimonta*): 28°18' N, 98°58' E; Point (*Helina setosiannosa*): 29°36' N, 103°29' E; Point (*Helina shui*): 29°13' N, 102°02' E; Point (*Helina subfloscula*): 30°20' N, 102°25' E; Point (*Helina subnigriabdomilis*): 28°30' N, 98°39' E

Acknowledgements

This study was supported by the National Nature Science Foundation of China (No. 30870330 and 31172139), the Ministry of Science and Technology of the People's Republic of China (MOST grant no. 2006FY110500) and the Foundation of Experimental Centre of Shenyang Normal University (SYZX200902). Special thanks are due to M.F. Shi, K.R. Huang, J.Y. Liu, Y. Zhao, X.D. Fei, L. Chang and X. Zhang for giving us invaluable help and providing materials.

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