

## CORRESPONDENCE

# Review of *Alloxiphia* Wei (Hymenoptera: Xiphydriidae), with descriptions of two new species from China

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**Abstract** The genus *Alloxiphia* Wei, 2002 was redescribed based on new materials. Two species from China were described as new to science, namely *A. tianmua* Wei, **sp. nov.** and *A. qinlingia* Wei, **sp. nov.** A key to known species of the genus is provided. The differences among *Alloxiphia*, *Palpixiphia* Maa, 1949 and *Hyperxiphia* Maa, 1949 were also briefly discussed.

**Key words** Siricomorpha, Xiphydriinae, taxonomy, sawflies.

Xiphydriidae is a small family of Hymenoptera with about 149 valid species belonging to 31 genera. It occurs in the Nearctic and Australia Regions with 6 genera and 27 species, and in the Holarctic and Oriental Regions with 26 genera and 135 species (Li *et al.*, 2019; Liu *et al.*, 2019; Shinohara, 2019; Smith, 2019, 2021; Shinohara *et al.*, 2020; Shinohara & Hara, 2021; Shinohara & Kameda, 2021; Shinohara & Yamasako, 2021). *Alloxiphia* Wei, 2002 is a small genus of Xiphydriidae, with 3 known species so far (Wei, 2002, 2006).

During the sawfly investigations to Mt. Tianmu of Zhejiang and Mt. Qinling of Shaanxi, two additional new species were found, and described here.

The type specimens of the new species are deposited in the Asian Sawfly Museum, Nanchang (ASMN). Specimens were examined with a Leica S8APO dissection microscope. Adult images were taken with a Nikon D700 digital camera and a series of images montaged using Helicon Focus ® (HeliconSoft, Kharkiv, Ukraine), while detail images were taken with a Leica Z16 APO/DFC550. All images were further processed with Adobe Photoshop CS 6.0®.

Terminology of sawfly genitalia follows Ross (1945), and terminology of wing venation follows Niu & Wei (2010).

### *Alloxiphia* Wei, 2002

*Alloxiphia* Wei, 2002: 856. Type species: *Alloxiphia sexpalpa* Wei, 2002, by original designation.

**Description.** Small and median-sized (Figs 1a–b, 2a); maxillary palp slender with 5 palpomeres, palpomere 2 much longer than palpomeres 3 and 4 together, palpomeres 3 and 4 short and subequal in length, palpomere 5 clearly longer than palpomeres 4 (Fig. 2g); labial palp with 3 palpomeres, palpomere 2 much longer than broad, palpomere 3 enlarged toward apex with a distinct sensory disc (Fig. 2f); malar space with a large and deep fovea, upper margin of fovea close to lower margin of eye, flat part of malar space narrower than diameter of median ocellus (Fig. 2d); distance between toruli about 3 times distance between torulus and inner margin of eye; frons and nearby roundly convex with coarse and irregular punctures and carinae, without regular longitudinal carinae (Figs 2b, d); occipital carina and postoccipital carina distinct; head as broad as thorax, roundly narrowed behind eyes and shorter than eye in dorsal view, temple and postocellar area smooth and shiny (Fig. 2b); antenna slender, pedicel longer than broad, antennomere 3 clearly longer than antennomere 4 (Fig. 2k), each antennomere in male more than twice as long as broad; fore tibia usually with 1 apical spur; metabasitarsus clearly shorter than following 4 tarsomeres together, tarsomere 5 not strongly enlarged; claw small with inner tooth short and remote from

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apical tooth (Fig. 2h); cell R1 both in fore wing and hind wing closed at apex, vein 2r meeting pterostigma almost at apex, vein 2A+3A close to but not touching vein 1A, basal anal cell closed; cells Rs and M in hind wing closed, anal cell petiolate (Figs 1a–b, 2a); ovipositor sheath shorter than half length of abdomen, ventral margin almost straight, apical sheath slightly shorter than basal sheath (Fig. 2e); male subgenital plate much broader than long, apical margin truncate.

Distribution. China.

Remarks. *Alloxiphia* Wei is quite similar to *Palpiphia* Maa, 1949 and *Hyperxiphia* Maa, 1949 in general appearance. *Palpiphia* differs from *Alloxiphia* by the maxillary palpomere 5 much shorter than palpomere 4, the labial palp with 4 palpomeres, the last labial palpomere not enlarged toward apex and without sensory disc, the frons and inner orbit regularly carinated, surface almost smooth and not coarsely reticulate, and the female apical tarsomere distinctly enlarged. *Hyperxiphia* differs from *Alloxiphia* by the maxillary palpomere 2 about as long as palpomeres 3 and 4 together, the palpomere 5 about as long as palpomere 4, the labial palp with 4 palpomeres, the frons and inner orbit regularly carinated, surface almost smooth and not coarsely reticulate.

After the paper, 5 species of *Alloxiphia* have been found, all of which are endemic in the Central and Southern China.

#### Key to species of *Alloxiphia* Wei, 2002.

1. Female.....2  
Male .....4
2. Tibiae black without white ring; maxillary palpomere 5 longer than palpomeres 3 and 4 together; dorsum of head without white macula. Sichuan ..... *A. inornata*  
Each tibia with a distinct white basal ring; maxillary palpomere 5 not longer than palpomeres 3 and 4 together .....3
3. Clypeus, supraclypeal area, lateral of postocellar area and posterior of temple with distinct yellow white maculae, abdominal tergite 8 without lateral white macula; basal 1/3 of hind tibia white, metabasitarsus black; apical 1/3 of fore wing and apical 1/4 of hind wing distinctly infusate; vein 2m-cu remote from vein 1r-m, petiole of hind anal cell shorter than cu-a. Shaanxi ..... *A. qinlingia* Wei, sp. nov.  
Clypeus, supraclypeal area, postocellar area and temple entirely black, abdominal tergite 8 with lateral white macula; basal half of hind tibia and metabasitarsus largely white; apical 2/5 of fore wing and of hind wing infusate; vein 2m-cu interstitial to vein 1r-m, petiole of hind anal cell as long as cu-a. Zhejiang ..... *A. tianmua* Wei, sp. nov.
4. Head behind eyes and all abdominal tergites black entirely; face between antennal toruli with recognizable longitudinal carinae; postocellar area largely polished and smooth, anterior margin only rugose. Hainan ..... *A. sexpalpa*  
Head behind eyes with 4 yellow white stripes, lateral of abdominal tergites with distinct white maculae; face between antennal toruli coarsely rugose, without recognizable longitudinal carinae; anterior half of postocellar area coarsely rugose, posterior half sparsely punctate .....5
5. Tegula, pronotum largely, broad anterior margin of mesepisternum yellow white, basal 4 or 5 antennomeres yellow brown; antennomere 3 1.3 times as long as antennomere 4. Zhejiang ..... *A. tianmua* Wei, sp. nov.  
Tegula, pronotum largely, anterior margin of mesepisternum black, mesepisternum with a small yellow dot near antero-dorsal angle of mesepisternum; basal 4 or 5 antennomeres black; antennomere 3 2 times as long as antennomere 4. Guizhou ..... *A. maculata*

#### *Alloxiphia tianmua* Wei, sp. nov. (Fig. 1)

Description. Female. Body length 14.0mm (Fig. 1a). Black; a short stripe on lower inner orbit and malar space, a small lateral macula on abdominal tergites 4 and 5, a lateral long macula on tergite 8 yellow white. Body hairs silver. Legs black, basal third of fore tibia, basal 2/5 of middle tibia, basal 1/2 of hind tibia, middle and hind basitarsi largely white. Fore and hind wings hyaline in basal 3/5 and distinctly infusate in apical 2/5, pterostigma black.

Body hairs very short. Clypeus with some large and sparse punctures; frons, ocellar area, inner orbits and supraclypeal area coarsely rugose mixed with irregularly carinae (Figs 1c–e), anterior third of postocellar area rugose, lower half of hind orbit sparsely punctured with some longitudinal carinae (Fig. 1d), upper part of hind orbit smooth with sparse large punctures, postocellar area largely and temple smooth with some minute punctures (Fig. 1c); lateral slope of mesoscutellum rugose with distinct smooth patch; abdominal tergite 1 coarsely punctured, inner margin smooth; tergites 2–5 distinctly microsculptured, feebly shiny; other tergites weakly microsculptured.

Maxillary palpomeres 3 and 4 each more than twice as long as broad, palpomere 5 shorter than palpomeres 3 and 4 together, without apical process; labial palp stout, palpomere 1 as long as palpomere 3 and 2 times as long as palpomere 2; flat part of malar space shorter than radius of median ocellus; eyes short and broad, inner margins subparallel downwards, distance between eyes at level of antennal toruli slightly broader than longest axis of eye; antenna with 19 antennomeres and about 1.8 times as long as head breadth, antennomeres 1 and 3 feebly bent, length ratio of basal 5 antennomeres about 43:17:29:17:16 (Fig. 1i), each flagellomere longer than broad and weakly microsculptured; dorsum of mesoscutellum

distinctly narrowed backwards; vein 2r in fore wing meeting cell 1Rs at apex, petiole of hind anal cell as long as cu-a; claw with a small inner tooth remote from outer tooth (Fig. 1f); ventral margin of ovipositor sheath almost straight, length of ovipositor sheath about 0.45 times as long as abdomen, apical sheath 0.9 times as long as basal sheath; cercus short and bent, about 1/6 length of apical sheath (Fig. 1g); sheath in dorsal view gradually narrowed toward apex (Fig. 1h).

Male. Body length 10.0–12.5 mm; clypeus, face, mandible largely, lateral stripes on postocellar area and a longitudinal stripe on hind orbit yellow white; pronotum and prosternum largely, broad anterior margin of and a small middle dot on

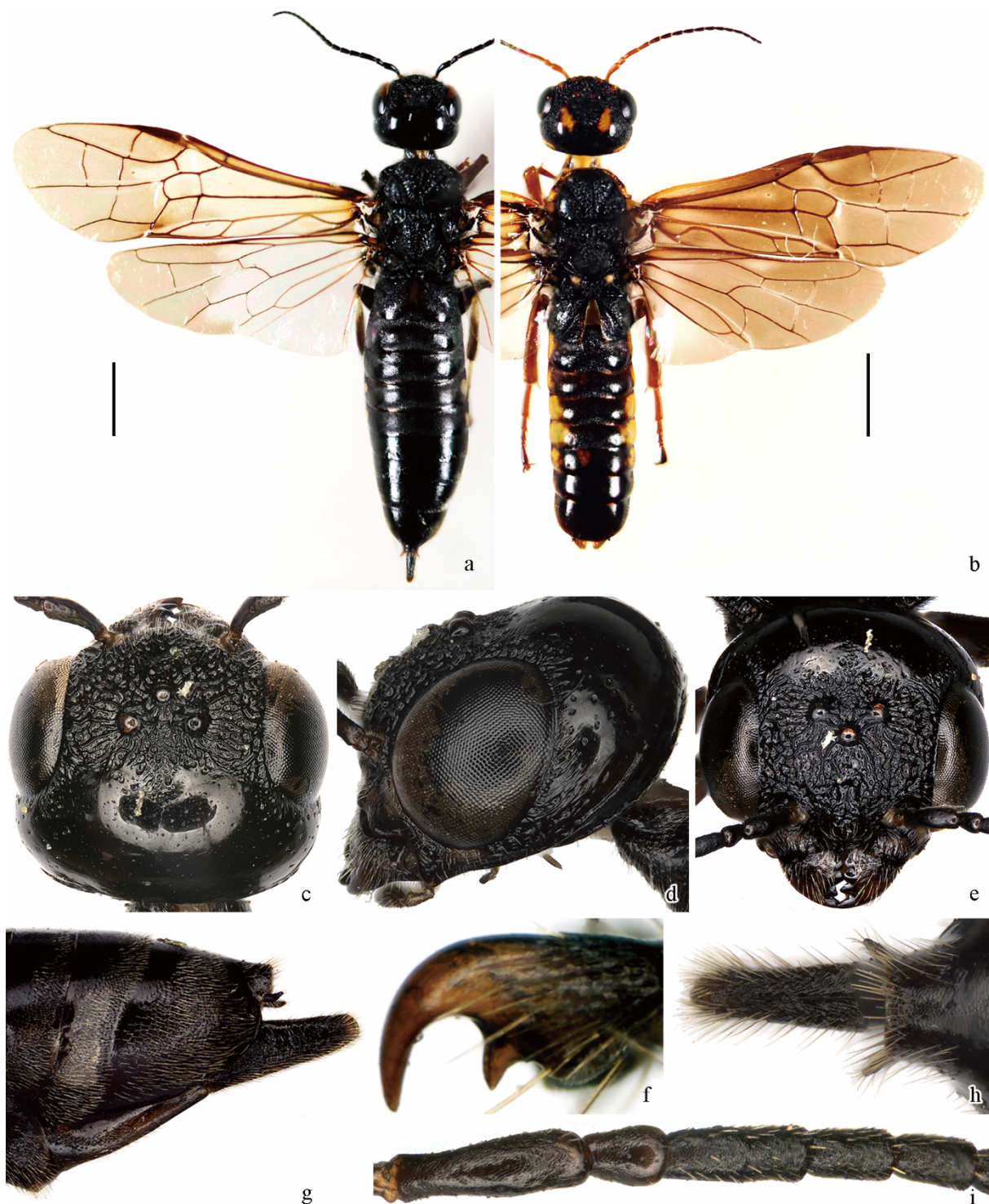


Figure 1. *Alloxiphia tianmua* Wei, **sp. nov.** a–b. Adult. a. Female, holotype; b. Male, paratype. c–i. Female, holotype. c. Head, dorsal view; d. Head, lateral view; e. Head, frontal view; f. Hind claw; g. Apical portion of abdomen, lateral view; h. Ovipositor sheath, dorsal view; i. Basal 5 antennomeres. Scale bars=2.0 mm.

mesepisternum yellow white, a small lateral macula on abdominal tergite 1 and large lateral macula on tergites 2–7 yellow white; legs orange brown, apex of each coxa yellow, femora brown; wings strongly and evenly infusate, pterostigma dark brown; antenna with 15–16 antennomeres, basal 4 to 5 antennomeres reddish brown, flagellomeres each more than twice as long as broad; petiole of hind anal cell much shorter than vein cu-a; subgenital plate about 2 times as broad as long.

Etymology. This new species is named after the type locality, Mt. Tianmu.

Distribution. China (Zhejiang).

Material examined. Holotype. ♀, Xianrending, Mt. Tianmu, Zhejiang, China, 119.424°E, 30.349°N, elev. 1506 m, May 28, 2017, Zejian Li, Mengmeng Liu, Kaiwen Gao, Tingting Ji legs. Paratypes. 3♂, Xianrending, Mt. Tianmu, Zhejiang, China, 119.424°E, 30.349°N, elev. 1506 m, July 10–16, 2017, Kaiwen Gao leg.

Remarks. This new species can be distinguished from other species of *Alloxiphia* by the above key.

### *Alloxiphia qinlingia* Wei, sp. nov. (Fig. 2)

Description. Female. Body length 14.0 mm (Fig. 2a). Black; clypeus, supraclypeal area, a stripe on lower inner orbit and malar space, an elliptical macula on lateral of postocellar area, a long and narrow stripe on postorbit, a small lateral macula on abdominal tergites 2, 4 and 5, narrow posterior margin of tergite 10, a middle short stripe on ovipositor sheath, yellow white. Body hairs silver. Legs black, a small basal dot on fore and middle tibiae, and basal 1/3 of hind tibia white. Fore wing hyaline in basal 2/3 and infusate in apical 1/3, hind wing hyaline in basal 3/4 and infusate in apical 1/4, pterostigma black.

Body hairs very short. Clypeus with some large and sparse punctures; frons, ocellar area, inner orbits and supraclypeal area coarsely rugose mixed with irregularly carinae (Figs 2b–d), anterior third of postocellar area rugose, lower half of hind orbit densely punctured with some longitudinal carinae (Fig. 2c), upper part of hind orbit smooth with sparse large punctures, postocellar area largely and temple smooth with some minute punctures (Fig. 2b); lateral slope of mesoscutellum rugose with some small smooth patch; abdominal tergite 1 coarsely punctured, inner margin smooth; tergites 2–5 densely microsculptured, almost mat (Fig. 2i); other tergites more weakly microsculptured toward apex.

Maxillary palpomeres 3 and 4 each more than twice as long as broad, palpomere 5 as long as palpomeres 3 and 4 together, without apical process (Fig. 2g); labial palp stout, palpomere 1 as long as palpomere 3 and 2 times as long as palpomere 2 (Fig. 2f); flat part of malar space shorter than radius of median ocellus; eyes short and broad, inner margins distinctly divergent downwards, distance between eyes at level of antennal toruli slightly broader than longest axis of eye; antenna with 17 antennomeres and about 1.7 times as long as head breadth, antennomeres 1 and 3 strongly bent, length ratio of basal 5 antennomeres about 45 : 20 : 44 : 24 : 24 (Fig. 2k), each flagellomere longer than broad and distinctly microsculptured; dorsum of mesoscutellum distinctly narrowed backwards; vein 2r in fore wing meeting cell 1Rs at apex, petiole of hind anal cell clearly shorter than cu-a; claw with a small inner tooth remote from outer tooth (Fig. 2h); ventral margin of ovipositor sheath almost straight, length of ovipositor sheath about 0.41 times as long as abdomen, apical sheath as long as basal sheath; cercus short and almost straight, about 1/5 length of apical sheath (Fig. 2e); sheath in dorsal view gradually narrowed toward apex (Fig. 2j).

Male. Unknown.

Etymology. This new species is named after the type locality, Huayin, located in Mt. Qinling.

Distribution. China (Shaanxi).

Material examined. Holotype. ♀, Huayin, Shaanxi, China, September 2, 2019, Liangdong Song leg.

Remarks. This new species is similar to *A. tianmua* Wei, **sp. nov.** from Zhejiang, but differs from the latter by the following: the clypeus and supraclypeal area entirely yellow white, the lateral of postocellar area and hind orbit with distinct yellow white maculae, the abdominal tergite 8 black without lateral white macula, the hind tibia white in basal third, the metabasitarsus black; the apical 1/3 of hind wing and apical 1/4 of hind wing infusate; the vein 2m-cu remote from 1r-m, the petiole of hind wing clearly shorter than cu-a; the antennomeres 1 and 3 distinctly bent and subequal in length.

### *Alloxiphia inornata* (Maa, 1949)

*Genaxiphia inornata* Maa, 1949: 58.

*Alloxiphia inornata*: Wei, 2002: 158.

Material examined. 1♀, Mt. Emei, Sichuan, China, elev. 1581 m, May 15, 2015, Haiyan Nie.

Distribution. China (Sichuan).

Remarks. This species differs from its congeners by the tibiae entirely black, the maxillary palpomere 5 clearly longer than palpomeres 3 and 4 together, the dorsum of head without white macula, and the ovipositor apical sheath clearly shorter



than ovipositor basal sheath.

***Alloxiphia maculata* Wei, 2006**

*Alloxiphia maculata* Wei, 2006: 654.

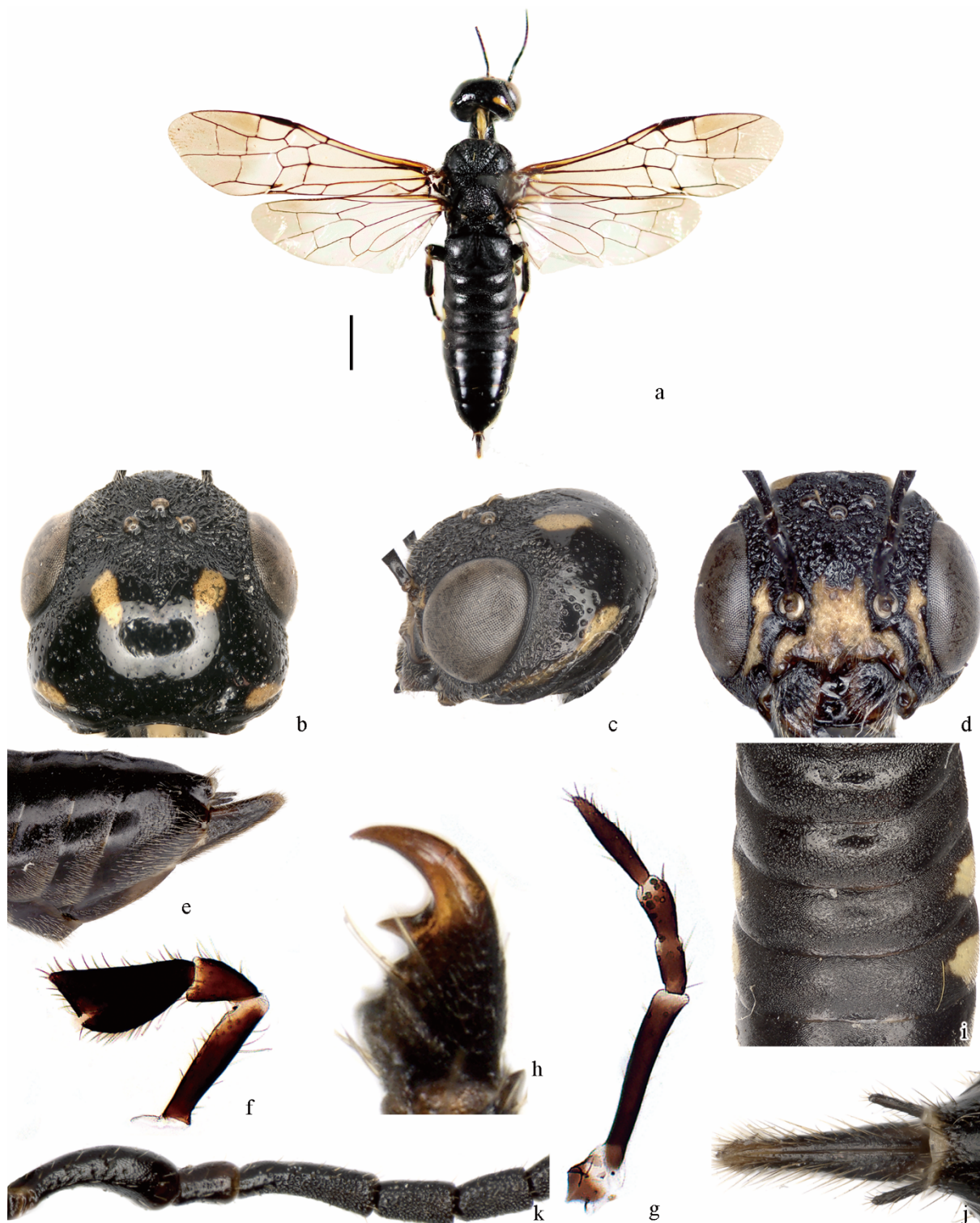


Figure 2. *Alloxiphia qinlingia* Wei, **sp. nov.**, female, holotype. a. Adult. b. Head, dorsal view. c. Head, lateral view. d. Head, frontal view. e. Apical portion of abdomen, lateral view. f. Labial palp. g. Maxillary palp. h. Hind claw. i. Abdominal tergites 2–5. j. Ovipositor sheath, dorsal view. k. Basal 5 antennomeres. Scale bar=2.0 mm.

Material examined. 1♂, holotype, Huixiangping, Mt. Fanjingshan, Guizhou, China, elev. 1800 m, August 1, 2001, Mingli Chen, Ningting Huang legs.

Distribution. China (Guizhou).

Remarks. This species is similar to *A. tianmua* Wei, **sp. nov.** from Zhejiang Province but differs from it by the tegula, pronotum largely, anterior margin of mesepisternum black, mesepisternum with a small yellow dot near the anterio-dorsal angle of mesepisternum; the basal 4 to 5 antennomeres black; and the antennomere 3 about 2 times as long as the antennomere 4.

### ***Alloxiphia sexpalpa* Wei, 2002**

*Alloxiphia sexpalpa* Wei, 2002: 856.

Material examined. 1♂, holotype, Mt. Jianfengling, Hainan, China, November 23, 1982, Qiyong Weng leg.

Distribution. China (Hainan).

Remarks. This species can be easily recognized from its known congeners by the head behind eyes and all abdominal tergites black entirely; the face between antennal toruli with recognizable longitudinal carinae; the postocellar area largely polished and smooth with anterior margin only rugose; the 5th maxillary palpomere with a short and small apical process.

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