

Two new species of Xiphydriidae (Hymenoptera) from Japan

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Abstract: Two new Xiphydriidae species are described from Japan: *Hyperxiphia nigroflagella* Wei sp. nov. and *Xiphydria tenuipes* Wei sp. nov. The known species of *Hyperxiphia* and *Xiphydria* are briefly discussed. Keys to species of *Hyperxiphia* and *Xiphydria* from Japan are also provided.

Key words: Symphyta; Xiphydriinae; *Hyperxiphia*; *Xiphydria*; taxonomy; key

日本项蜂科二新种（膜翅目）

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摘要: 记述日本国项蜂科 2 新种: 黑鞭异跗项蜂 *Hyperxiphia nigroflagella* Wei sp. nov. 和细足项蜂 *Xiphydria tenuipes* Wei sp. nov., 简要讨论了日本分布的异跗项蜂属和项蜂属种类, 编制了异跗项蜂属和项蜂属分种检索表。

关键词: 广腰亚目; 项蜂亚科; 异跗项蜂属; 项蜂属; 分类; 检索表

Introduction

Xiphydriidae is a small family of Hymenoptera with about 145 valid species belonging to 31 genera. This family occurs in the Nearctic and Australia Realms represented by 6 genera and 26 species, and in the Holarctic Region by 25 genera and 119 species. Within the Holarctic region, only *Xiphydria* Latreille, 1803 is really Holarctic. The remaining 24 genera and 73 species are endemic to eastern and southern Asia, extending to the northwestern Pacific region.

Hyperxiphia Maa, 1949 includes 17 known species and all of them occur in Eastern and Southern Asia. Four species of this genus have been recorded from Japan (Takeuchi 1938; Maa 1949; Okutani 1958; Togashi & Hirashima 1982; Togashi 1975, 2007). *Euxiphydria leucopoda* Takeuchi, 1938 was placed in *Hyperxiphia* by Taeger *et al.* (2010) but now it is placed in *Euxiphydria* (Smith & Shinohara 2011) although the generic placement of this species is still not correct. The peculiar maxillary palp of *Euxiphydria leucopoda* Takeuchi shows that it represents an undescribed genus in this family (Niu GY, unpublished). *Euxiphydria leucopoda* var. *nakanishii* Takeuchi, 1938 was also placed in *Hyperxiphia* by

Accepted 5 May 2019. Published 25 September 2019. Published online 30 August 2019.

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Taeger *et al.* (2010) as *Hyperxiphia nakanishii* (Takeuchi, 1938) and this treatment was accepted by Smith & Shinohara (2011). However, examination of the type specimen of this species shows that the labial palp of *Hyperxiphia nakanishii* has only 3 palpomeres, and the cells R1 in fore wing and hind wing open at apex. So, it is not a member of *Hyperxiphia*.

Xiphydria is the largest genus in Xiphydriidae with 37 known species (Taeger *et al.* 2010; Shinohara & Kameda 2019). Among them, 11 species occur in North America, 9 species in Europe and 26 species in Asia. Seven species of *Xiphydria* have been recorded from Japan (Takeuchi 1938; Shinohara & Kameda 2019). Only one additional new species of this genus has been described from Japan after Takeuchi (1938) (Shinohara & Kameda 2019), except for *Pseudoxiphydria yasumatsui* Togashi, 1972, which Taeger *et al.* (2010) listed under *Xiphydria*. But the state of *Pseudoxiphydria* (possibly a junior synonym of *Konowia*) is uncertain at present.

Material and methods

Specimens were examined with a Motic-SMZ-168 stereomicroscope. Adult images were taken using a Nikon D700 digital camera and the series of images were montaged using Helicon Focus (©HeliconSoft). All images were further processed with Adobe Photoshop CS 11.0.

Morphological descriptions of new species are based on the holotype. The terminology of genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002) and Niu & Wei (2010).

Abbreviations. OOL — distance between the eye and outer edge of lateral ocellus; POL — distance between the mesal edges of the lateral ocelli; OCL — distance between a lateral ocellus and the occipital carina or hind margin of the head.

Types examined during this study are deposited in the Insect Collection of National Museum of Nature and Science, Tsukuba (NSMT).

Taxonomy

1. *Hyperxiphia nigroflagella* Wei sp. nov. (Figs. 1–14)

Female (Holotype). Body length 10 mm (Fig. 2); Black; main part of mandible, palps, malar space, narrow stripe on inner orbit, clypeus and connected broad stripe on dorsal of torulus, a small spot on center of frons (Fig. 3), postorbit except for occipital carina (Fig. 5), posterior corner of pronotum, a central large spot on venter of propleuron, a broad dorsal stripe on mesepisternum, an obscure spot near posterior corner of mesepisternum (Fig. 8), a lateral stripe on abdominal tergite 2, a small round spot on lateral margin of tergites 5 and 6, 1 quadrate macula on lateral of tergite 8 (Fig. 11) yellow; antennal flagellum black, basal 2 antennomeres dark brown (Fig. 12); ventral margin of ovipositor basal sheath, posterior margin of tergite 10 and cercus pale brown (Fig. 11). Legs black brown, coxa, trochanter, apex of femur, basal 0.2 of fore and middle tibiae, basal 0.4 of hind tibia, middle and hind basitarsus largely yellow brown to pale brown. Wings hyaline, veins and pterostigma dark brown (Fig. 2).

Head in front of lateral ocelli and anterior 0.3 of postocellar area reticulate, mixed with regular longitudinal carinae, middle carinae weakly convergent toward clypeus, area between malar space and torulus regularly striated (Fig. 3); lower half of hind orbit with several sharp longitudinal carinae, without punctures (Fig. 5); upper orbit, temple and most of postocellar area polished, smooth, shiny (Fig. 4); basal 2 antennomeres smooth, flagellomeres rugose (Fig. 12); pronotum largely glabrous, smooth, narrow dorsal plate with short and irregular carinae (Fig. 13); propleuron reticulate; mesonotum reticulate with some short and irregular carinae, furrows shallow with short carinae; dorsal of mesoscutellum coarsely punctured mixed with some short and irregular carinae, mat (Fig. 13); interspaces between large and dense punctures on lateral slope smooth, parapsis partly smooth and partly carinated; metascutellum with 4–5 curved transverse carinae (Fig. 13); mesepisternum sparsely punctured, surface smooth, shiny, punctures quite large, interspaces very broad, posterior corner impunctate (Fig. 8), mesepimeron with regular carinae; metapleuron largely reticulate; abdominal tergum 1 densely punctured mixed with some carinae, interspaces between punctures narrow, central part of tergum sparsely punctured; tergites 2–3 densely punctured, narrow posterior margins and tergites 4–8 almost entirely densely microsculptured, mat, narrow posterior margin of tergites 4–8 smooth (Fig. 14), tergites 9–10 weakly microsculptured mixed with some shallow punctures; venter of abdomen densely microsculptured except for narrow posterior margin; basal sheath weakly microsculptured, apical sheath densely microsculptured.

Flat part of malar space linear, fovea deep and large, longest axis of eye 1.3 times shortest axis of eye, upper margin of hind orbit quite short, length about 0.46 times as long as shortest axis of eye (Fig. 5); inner margins of eyes distinctly divergent downward, distance between eyes at toruli level 0.9 times as long as longest axis of eye; middle tooth of clypeus quite short and triangular; distance between toruli 2.8 times as long as distance between torulus and eye (Fig. 3); maxillary palp slender, palpomere 1 about 2 times as long as broad, palpomere 2 weakly bent, 10 times as long as middle breadth, palpomere 3 as long as palpomere 4, 1.1 times as long as palpomere 5 and 0.48 times as long as palpomere 2, palpomere 5 with a ring at basal 0.28 (Fig. 6); labial palp 1.4 times as long as maxillary palp, palpomere 2 0.5 times as long as palpomere 1 and 0.8 times as long as palpomere 4, palpomere 4 weakly enlarged toward apex with a small but distinct sensory pit (Fig. 7); head in dorsal view strongly narrowed behind eyes, temple length about half length of eye (Fig. 4). Antenna weakly compressed and distinctly tapering toward apex, total length 1.8 times as long as head breadth, antennomere 2 2.2 times as long as broad and 1.2 times as long as antennomere 4, antennomere 5 1.5 times as long as broad (Fig. 12). Mesoscutellum weakly and roundly elevated, without distinctly defined dorsal area; distance between cenchri 2.2 times longest axis of a cenchrus, metascutellum about 2 times as broad as long (Fig. 13); mesepisternum as in Fig. 8. Length ratio of fore tibia, basitarsus and tarsomeres 2–5 as 5 : 4 : 5.5, inner tibial spur as in Fig. 1, 2nd spur slender and 0.4 times as long as inner spur; hind tibia almost as long as tarsus, metabasitarsus as long as following 4 tarsomeres together; claw of fore and middle leg with inner tooth close to and slightly shorter than apical tooth, hind claw with inner tooth much shorter than and remote from apical tooth (Fig. 9). Forewing: free abscissa of vein Sc interstitial to base of vein Rs, 1st abscissa of Rs 0.4 times as long as cell 1M, vein 2r meeting apex of pterostigma, vein cu-a meeting cell 1M at basal 0.2, cell C about 2 times as broad as vein C; petiole of hind anal cell as long as breadth of anal cell and length of curved vein cu-a (Fig. 2). Cercus 2.5 times as long as broad; ovipositor sheath 0.5 times

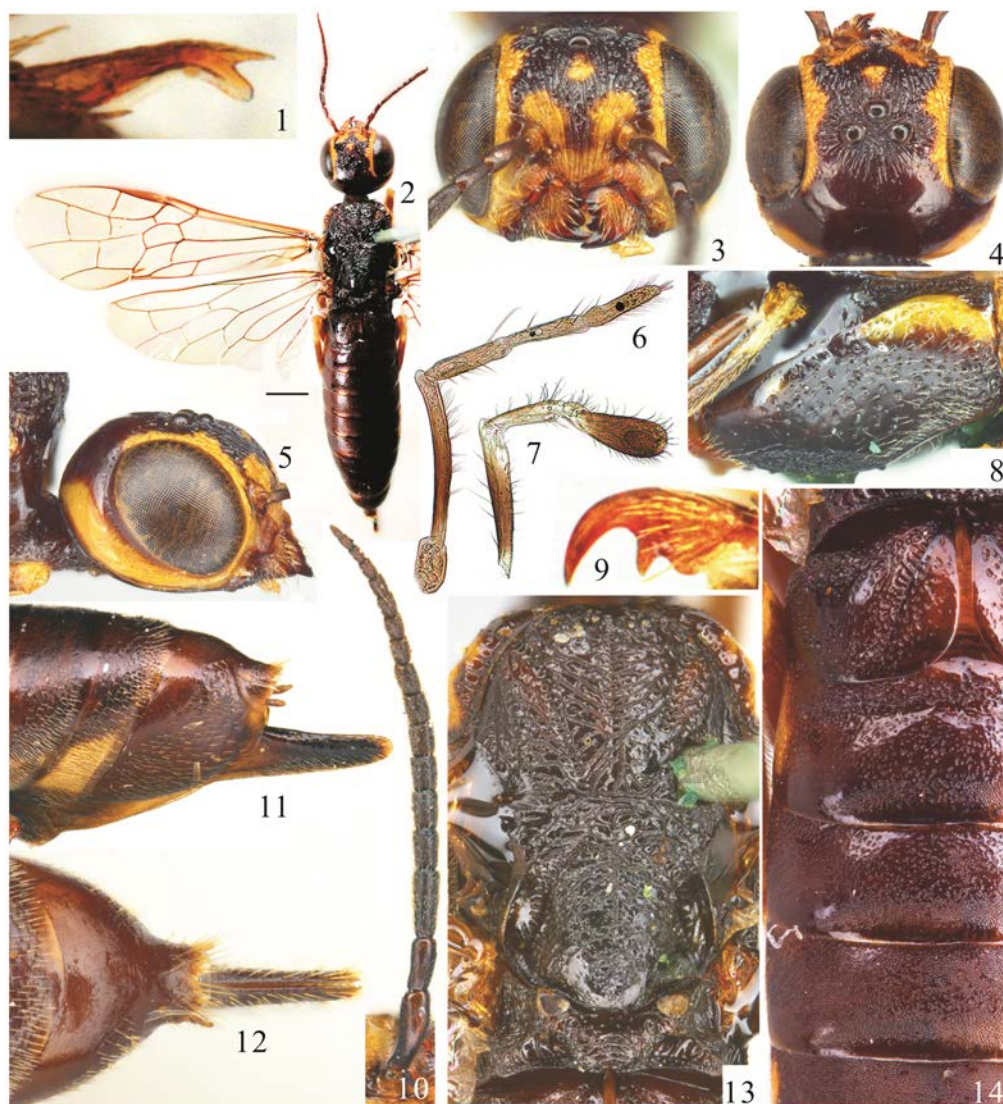
as long as abdomen, basal sheath as long as apical sheath (Fig. 11), in dorsal view sheath weakly narrowed toward apex (Fig. 12).

Male. Unknown.

Holotype. ♀, **Japan**, “13-VIII-1936, Mururoahu, -Kussia, Tarheizan”; “holotype” [red]; “*Hyperxiphia nigroflagella* Wei sp. nov.” (NSMT).

Etymology. The specific epithet refers to the black flagellum of the species.

Distribution. Japan.



Figures 1–14. *Hyperxiphia nigroflagella* Wei sp. nov., ♀, holotype. 1. Tibial spur of fore leg; 2. Adult, dorsal view, scale bar = 1 mm; 3. Head, frontal view; 4. Head, dorsal view; 5. Head, lateral view; 6. Maxillary palp; 7. Labial palp; 8. Mesepisternum, lateral view; 9. Hind claw; 10. Antenna; 11. Apex of abdomen and ovipositor sheath, lateral view; 12. Apex of abdomen and ovipositor sheath, dorsal view; 13. Meso- and metathorax, dorsal view; 14. Abdominal tergites 1–4, left side.

Remarks. This species is somewhat similar to *H. flavicornis* (Rohwer, 1912) but differs from the latter by the following: antenna with 17 antennomeres, flagellum entirely black; the abdominal tergites 5 and 6 with round lateral yellow spots, tergite 7 without lateral yellow macula; anterior surface of pronotum smooth, without longitudinal striae; the last maxillary palpomere almost as long as the 4th palpomere and with a distinct basal ring, and the flat part of malar space linear.

The 4 Japanese species of *Hyperxiphia* can be separated by the following key.

Key to Japanese species of *Hyperxiphia*

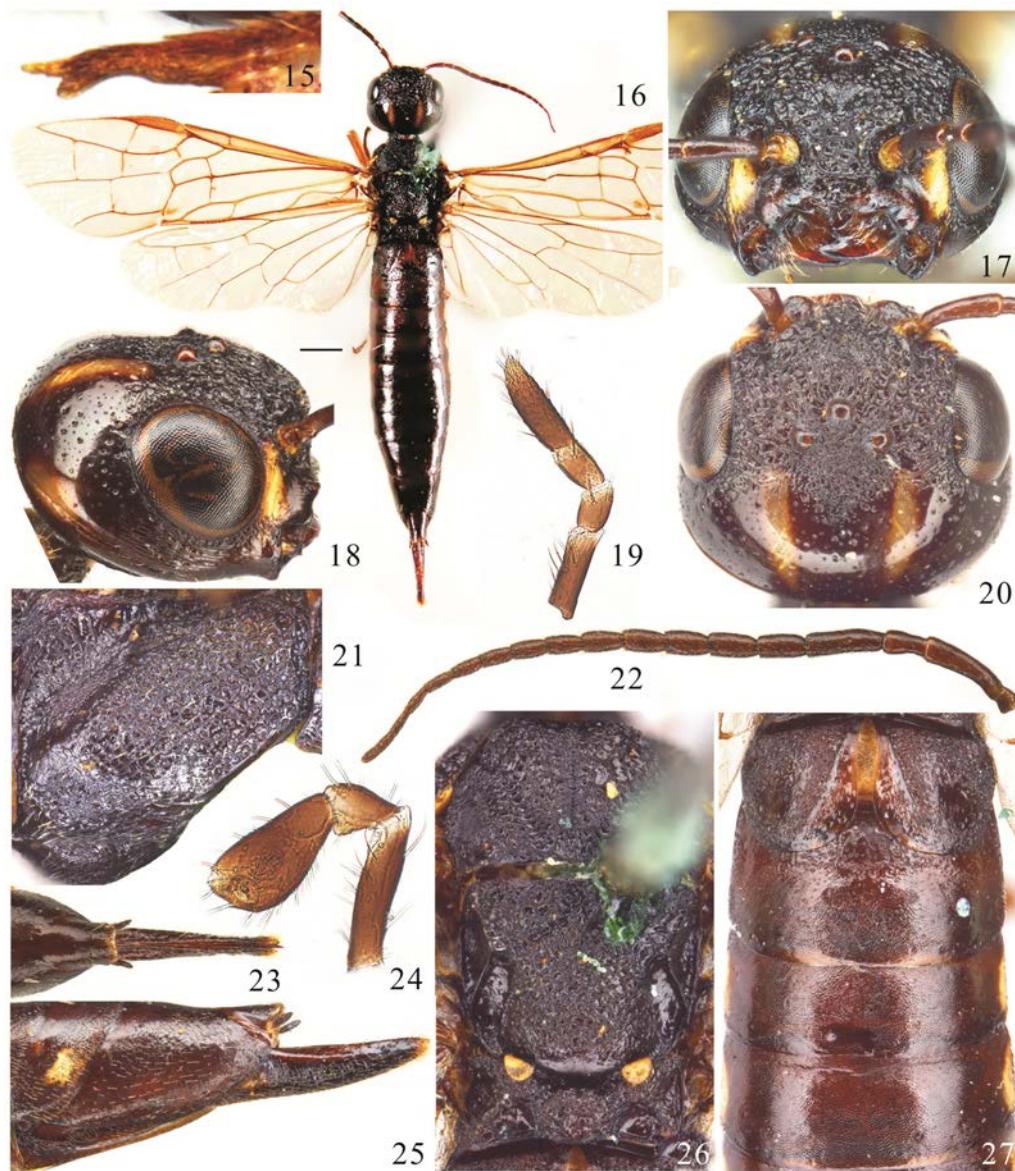
1. Wings hyaline; apical maxillary palpomere much shorter than 4th palpomere; third labial palpomere oblique, apical palpomere joining 3rd palpomere at about middle..... 2
- Wings distinctly infusate; apical maxillary palpomere longer than 4th palpomere; third labial palpomere not oblique, apical palpomere joining 3rd palpomere at apex; flat part of malar space almost as long as diameter of median ocellus..... 3
2. Flat part of malar space distinct; antenna and leg yellow brown; head yellow with a long sphenoidal stripe; thorax black with many yellow maculae; 8th sternite without hair brush. Female unknown *H. yamamotoi* (Okutani)
- Flat part of malar space linear; antennal flagellum black, basal 2 antennomeres and femora largely dark brown; dorsum of head largely black, mesonotum and metanotum entirely black. Male unknown *H. nigroflagella* Wei **sp. nov.**
3. Antenna with 14 antennomeres; hind basitarsus shorter than following 3 tarsomeres together; 2nd labial palpomere short, less than 3 times as long as broad; 3rd maxillary palpomere more than twice as long as broad..... *H. nodai* Togashi & Hirashima
- Antenna with 18 antennomeres; hind basitarsus longer than following 3 tarsomeres together; 2nd labial palpomere long, about 4 times as long as broad; 3rd maxillary palpomere less than twice as long as broad ... *H. tabunokii* Togashi

2. *Xiphidria tenuipes* Wei **sp. nov.** (Figs. 15–27)

Female (Holotype). Body length 9.5 mm (Fig. 16). Black; a short stripe on anterior half of malar space and lower end of inner orbit (Fig. 17), a long stripe on lateral of vertex, a short stripe on posterior of temple (Fig. 18), narrow posterior corner of pronotum, outer margin of tegula, cenchrus, narrow lateral stripe on abdominal tergites 3–6 just above lateral carina and a small spot just below spiracle of tergite 7, yellow white; antenna black, basal 2 antennomeres black brown (Fig. 22); labial and maxillary palps dark brown, ventral margin of ovipositor basal sheath brown. Legs reddish brown, coxae dark brown. Body hairs silver, setae on sheath brown. Wings subhyaline, veins and pterostigma brown to dark brown (Fig. 16).

Face, frons and inner orbits coarsely reticulate mixed with large punctures and irregular carinae, anterior 0.25 of postocellar area rugose (Figs. 17–20), middle of postorbit densely striated (Fig. 18), area between malar space and torulus finely and densely striated, lower end and upper end of hind orbit, temple and vertex smooth, scattered with some distinct punctures, shiny (Figs. 18, 20). Antennomeres 1–2 smooth, flagellomeres weakly microsculptured (Fig. 22). Thorax coarsely reticulate, without distinct smooth area, narrow posterior margin of mesoscutellum coriaceous, less shiny (Fig. 26), bottom of parapsis rugose; upper of mesepimeron with low and irregular carinae, mat, ventral part rugose (Fig. 21). Abdominal tergite 1 densely punctured, broad inner margin and central area sparsely punctured, shiny;

other tergites and sternites densely microsculptured, feebly shiny (Fig. 27).



Figures 15–27. *Xiphydria tenuipes* Wei sp. nov., ♀, holotype. 15. Tibial spur of fore leg; 16. Adult, dorsal view, scale bar = 1 mm; 17. Head, frontal view; 18. Head, lateral view; 19. Maxillary palpomere 2–5; 20. Head, dorsal view; 21. Mesepisternum, lateral view; 22. Antenna; 23. Apex of abdomen and ovipositor sheath, dorsal view; 24. Labial palp; 25. Apex of abdomen and ovipositor sheath, lateral view; 26. Meso- and metathorax, dorsal view; 27. Abdominal tergites 1–4.

Maxillary palp short, palpomere 2 slightly shorter than palpomeres 3–4 together and shorter than palpomere 5, palpomeres 3 and 4 subequal in length and each about 1.5 times as long as broad, palpomere 5 slightly longer than palpomeres 3+4 together (Fig. 19); labial palp

with palpomere 2 less than 2 times as long as broad, palpomere 3 distinctly enlarged toward apex with a small sensory pit (Fig. 24); middle tooth of clypeus short, triangular; malar space 1.1 times as long as antennomere 2, apical fovea distinct but short, flat part of malar space 2 times as long as diameter of median ocellus (Figs. 17, 18); shortest distance between eyes 1.6 times as long as longest axis of eye, distance between toruli 2 times as long as distance between torulus and eye, middle fovea shallow but distinct (Fig. 17); in dorsal view head roundly enlarged at middle and strongly narrowed in posterior part, temple slightly shorter than eye, POL : OOL : OCL = 20 : 25 : 61 (Fig. 20). Antenna slender, total length 2 times as long as head breadth, with 17 antennomeres, antennomere 1 longer than antennomere 3, antennomere 2 0.9 times as long as antennomere 4, antennomere 6 2 times as long as broad (Fig. 22). Propleuron quite short, about 1.3 times as long as height and ventral breadth; anterior dorsal corners of mesoscutal middle lobe strongly convex, anterior slope perpendicular, middle furrow and notaulix quite shallow; mesoscutellum weakly elevated, anterior basin absent; metascutellum about 1.5 times as broad as long, distance between cenchri 2.8 times as long as longest axis of a cenchrus (Fig. 26). Leg slender, fore tibia 0.5 times as long as tarsus, with 1 apical spur (Fig. 15); hind tibia 0.75 time as long as hind tarsus, tibial spurs equal in length and slightly shorter than apical breadth of tibia; metabasitarsus slender, slightly longer than following 3 tarsomeres together, 0.85 times as long as following 4 tarsomeres together; tarsomere 4 of fore and middle tarsi much longer than broad, tarsomere 4 of hind tarsus slightly longer than broad; claw without basal lobe, inner tooth small, much shorter than and remote from apical tooth. Fore wing: vein Sc almost interstitial to base of vein Rs, 1st abscissa of Rs 0.6 times as long as cell 1M, 2r meeting pterostigma at apical 0.2, vein cu-a interstitial to vein 1M; hind anal cell with a petiole about 0.6 times as long as vein cu-a (Fig. 16). Ovipositor sheath as long as hind tibia and tarsus together, 0.65 times as long as abdomen, apical sheath as long as basal sheath and weakly bent, tergite 10 short and flat (Fig. 25), in dorsal view apical sheath distinctly broadened toward base (Fig. 23).

Male. Unknown.

Holotype. ♀, **Japan**, “02-VII-1930, Isshio, Takeuchi leg.”; “Holotype”; *Xiphydria tenuipes* Wei sp. nov., det. M. Wei, 2016”.

Etymology. This specific epithet is from the Latin *tenuis* (thin) referring to its long and slender legs.

Distribution. Japan.

Remarks. This species is somewhat similar to *Xiphydria popovi* Semenov & Gussakovskij, 1935 but differs from the latter by the following: the maxillary palp short with palpomere 5 only 3 times as long as broad, the palpomeres 3 and 4 subequal in length and about 1.5 times as long as broad; legs very slender, the hind tibia and tarsus together as long as ovipositor sheath; the malar space with a white macula in anterior half, posterior half of malar space and hind orbits black; antenna with 17 antennomeres and body much smaller, body length 9.5 mm. In *Xiphydria popovi* the maxillary palp slender with palpomere 5 about 6 times as long as broad, the palpomere 3 longer than palpomere 4 and about 3 times as long as broad; legs normal, the hind tibia and tarsus together shorter than ovipositor sheath; the malar space entirely white, hind orbits with a long white stripe; antenna with 21 antennomeres and body much larger, length 11–21 mm and usually 18–21 mm.

The 6 Japanese species of *Xiphydria* can be separated by the following key.

Key to Japanese species of *Xiphydria*

1. Antenna partly white in female, or legs largely black; 2nd antennomere usually not shorter than 4th antennomere 2
- Antenna without white in both sexes; tibia and tarsus reddish; 2nd antennomere usually clearly shorter than 4th antennomere 5
2. Legs red or reddish brown or yellow; antenna with 17–20 antennomeres in both sexes 3
- Legs largely or entirely black, at least femora, trochanter and coxa black, if some small males with reddish legs, then antenna with 14–15 antennomeres 4
3. Legs red; antenna with 17–18 antennomeres, apical 1–2 antennomeres darkened in female; head with few white maculae, thorax entirely black *X. palaeanarctica* Semenov
- Legs yellow; antenna with 20 antennomeres, apical 5–6 antennomeres darkened; head and thorax with many pale maculae *X. buyssoni* Konow
4. Antenna with 14–15 antennomeres, 2nd antennomere as long as 4th antennomere; last tergite in male subtriangularly extending backwards with lateral sides forming a distinct angle at about 90 degrees
..... *X. ogasawarai* Matsumura
- Antenna with 16 antennomeres, 2nd antennomere longer than 4th antennomere; last tergite in male roundly extending backwards with lateral sides forming an obtuse angle at about 120 degrees
..... *X. alnivora* Matsumura
5. Femora black to black brown; clypeus and lower frons mostly creamy white *X. eborata* Konow
- Femora reddish brown; clypeus and lower frons usually black, occasionally marked with pale brown or creamy white 6
6. Malar space and adjacent parts of lower gena and lower inner orbit creamy white; small whitish spot usually present above each torulus; whitish area along posterior margin of pronotum usually broad
..... *X. albopicta* Shinohara & Kameda
- Malar space and lower inner orbit entirely black; lower part of gena often with creamy white spot but not extending anteriorly; no whitish spot above each torulus; whitish area along posterior margin of pronotum very narrow 7
7. Antennomere 2 almost as long as antennomere 4; legs very slender, hind tibia and tarsus together as long as ovipositor sheath *X. tenuipes* Wei **sp. nov.**
- Antennomere 2 clearly shorter than antennomere 4; legs not very slender, hind tibia and tarsus together clearly shorter than ovipositor sheath *X. camelus* (Linnaeus)

Acknowledgements

We thank Dr. M. OHARA (Hokkaido University, Sapporo, Japan) and Dr. M. ISHII (Osaka Prefecture University, Sakai, Japan) for lending us material for the present study. The authors are deeply grateful to the anonymous referees for the valuable comments and suggestions. This research was partly supported by the National Natural Science Foundation of China (31672344, 31501885).

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