

Taxonomic Notes and New Distribution and Host Plant Records for Sawflies and Woodwasps (Hymenoptera, Symphyta) of Japan III

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Abstract Taxonomic and bionomic notes, and new distribution and host plant records are given for 19 species of Argidae, Tenthredinidae and Cephidae of Japan and Korea. Redescriptions or additional descriptions are given for *Arla rufithorax* (Togashi, 1995), *Nematus viburnum* Hara, 2017, *Pristiphora albobalteata* Takeuchi, 1933 and *P. fulviceps* Takeuchi, 1933. The males of these four species are described for the first time. Eleven species are newly recorded from Hokkaido and one species each from Honshu, Shikoku, the Ryukyu Islands and Korea, respectively. Previous distribution record of *Janus piri* Okamoto and Muramatsu, 1925, from Japan and that of *Sinicephus giganteus* (Enderlein, 1913) from East Siberia are erroneous. New host plant records are given for *Mesoneura mikagei* Togashi, 1998, *Monophadnoides smithi* Togashi, 1980 and *P. fulviceps*.

Key words: Hymenoptera, Argidae, Tenthredinidae, Cephidae, distribution, host plant, larva, redescription.

Introduction

Under the present title, we have published two papers (Shinohara and Hara, 2015; Hara and Shinohara, 2017), where we reported on new findings and ideas on various aspects of the Japanese sawflies and woodwasps, including taxonomy, distribution, bionomics and host plants. Each bit of the information included here is apparently trifling, but we believe accumulation of such small bits of knowledge will really contribute to the full understanding of the diversity of these insects. This is the third paper in the series and treats one species of the Argidae, 15 species of the Tenthredinidae and three species of the Cephidae.

We dedicate the present paper to the memory

of the late Dr. Ichiji Togashi (1929–2017), who passed away on November 5, 2017. He made a great contribution to the study of sawflies and woodwasps of eastern Asia through his numerous publications and his very friendly support and encouragement to all colleagues.

Material and Methods

The material used in this study is kept in the National Museum of Nature and Science, Tsukuba. Observations of morphology were made with a Leica MS5 stereo binocular microscope and Olympus BH-2 light microscope. Photographs were taken with digital cameras, Nikon D2X, Olympus Stylus TG-4 Tough, Sony DSC-H7, Sony DSC-RX100. The digital images were

processed and arranged with Adobe Photoshop Elements 8 and 15® software. For the morphological terminology, we generally follow Viitasaari (2002). Rearings were done in the rooms in Shintoku and Bibai, Hokkaido by Hara, in Nakagawa, Tochigi Pref., Honshu by Ibuki, and in Tsukuba, Ibaraki Pref., Honshu by Shinohara. In the rearing rooms, the temperature and day length were not controlled. However, in the rearings in Shintoku and Bibai, the hibernating individuals were moved in March or April into air-conditioned rooms, where the temperatures were about 10–25°C.

Results and discussion

Argidae

Spinarge prunivora Hara and Shinohara, 2006

(Fig. 1A, B)

Spinarge prunivora Hara and Shinohara, 2006: 82; Shinohara and Hara, 2013: 101.

Material examined. SHIKOKU: Ehime Pref.: 7 ♀, Mt. Takanawa-yama, 900m, 33°56'33"N 132°51'11"E, coll. gregarious larvae on *Cerasus* × *yedoensis*, 4. IX. 2017, mat. 8–9. IX., em. 27–29. IX. 2017, A. Shinohara; 8 mature larvae (in ethanol), same collection data, mat. 9–10. IX., fixed 10. IX., A. Shinohara.

Distribution. Japan: Hokkaido, Honshu, Shikoku (new record), Kyushu. Korea (Shinohara and Hara, 2013).

Bionomics. Host plants: Rosaceae: *Cerasus sargentii* (Rehder) H. Ohba, *C.* × *yedoensis* (Matsum.) A. V. Vassil.

On September 4, 2017, Shinohara found a total of 15 larvae of this species feeding on the leaves of *Cerasus* × *yedoensis* on Mt. Takanawa-yama, Ehime Prefecture, Shikoku. Seven larvae were feeding in a group (Fig. 1A), whereas the remaining eight were scattered on different nearby leaves. All of the seven larvae forming the group matured on September 8 and 9, and seven female adults emerged on September 27 to 29 of the same year. The eight remaining larvae matured on September 9 to 10 and all

were fixed in ethanol. This is a multivoltine species (Hara and Shinohara, 2006).

Remarks. *Spinarge prunivora* is recorded here for the first time from Shikoku. The late-instar larvae of the Shikoku larvae had entirely pale thoracic legs as in the Hokkaido and Honshu specimens, unlike the Kyushu larvae, which have black-marked thoracic legs (Shinohara and Hara, 2013).

Tenthredinidae

Ametastegia geranii (Takeuchi, 1929)

Emphytina geranii Takeuchi, 1929: 501.

Protemphytus geranii: Takeuchi, 1952a: 37; Takeuchi, 1952b: 52.

Ametastegia geranii: Abe and Togashi, 1989: 546; Taeger *et al.*, 2010: 256; Lelej, 2012: 72.

Material examined. HOKKAIDO: 1 ♀, Bibai, Koshunai, 6. VI. 2013, H. Hara.

Distribution. Japan: Hokkaido (new record), Kunashiri Is. (Lelej, 2012), Honshu (Takeuchi, 1929), Shikoku (Takeuchi, 1952b).

Remarks. This is the first record from Hokkaido.

Ametastegia otogirii Okutani, 1956

Ametastegia (Protemphytus) otogirii Okutani, 1956: 97.

Ametastegia otogirii: Abe and Togashi, 1989: 546; Taeger *et al.*, 2010: 256.

Material examined. HOKKAIDO: 2 ♀, Tokachi, Shintoku, 4. IX. 2011, H. Hara; 1 ♂, Fukagawa, Takadomari, 9. VI. 2012, H. Hara.

Distribution. Japan: Hokkaido (new record), Honshu (Okutani, 1956).

Remarks. This is the first record from Hokkaido.

Arla rufithorax (Togashi, 1995)

(Figs. 1C–E, 3A–H)

Kihadaia rufithorax Togashi, 1995: 92.

Arla rufithorax: Wei and Nie, 1998: 7; Wei and Nie, 2003: 44; Taeger *et al.*, 2010: 632.

Additional description, female (Fig. 1C, D).

Mesoscutellum often darkened. Wings somewhat pale apically. Head in dorsal view with length behind eye $0.5\text{--}0.6 \times$ eye length. Postocellar area anteriorly narrowly furrowed entirely; lateral furrow anteriorly distinct. Depression of dorsal tentorial pit fused with depression around torulus but separated from it by low transverse ridge. Distance between toruli $1.0\text{--}1.3 \times$ distance between torulus and eye. Genal carina inconspicuous. Antenna with pedicel shorter than scape; first flagellomere longer than second; apical four flagellomeres combined $1.1\text{--}1.2 \times$ as long as first flagellomere. Mandibles each with three inner teeth; most basal tooth weak. Mesoscutellar appendage bare. Mesepisternum setose dorsally and ventrally, widely bare in middle. Basal two tarsomeres of all legs without planter lobe. Forewing with joint of crossvein 2r-m and vein M apart from joint of crossvein 2m-cu and vein M; basal anterior angle of vein 2A + 3A without basally projecting spur. Cercus about $2.5\text{--}3.5 \times$ as long as wide (Fig. 3C). Ovipositor (Fig. 3D, E): Lance distinctly widened at basal third, slightly serrate on middle of dorsal margin, with annular sutures waved, and annuli oblique, their dorsal ends located apical to ventral ends; lancet nearly straight, with about 20–23 serrulae; basal annulus with serrula inconspicuous or very small; rows of ctenidial setae long, widely separated from ventral margin of lancet. Punctures fine or inconspicuous.

Description, male (hitherto undescribed) (Fig. 1E). Differing from female as follows except for usual sexual differences.

Length 6.0–7.0 mm. Black, without pale areas.

Subgenital plate widely truncate apically. Genitalia Fig. 3F, G; gonostipes in ventral view with posteromedial margin concave; parapenniss absent; harpe apically rounded; penis valve (Fig. 3H) simple, in dorsal view narrow, roundly convex laterally at middle of valviceps, in lateral view weakly concave dorsally near apex and rounded apically, with scale like wrinkles apically.

Material examined. HONSHU: Tochigi Pref.: 12 ♀ 4 ♂, Nakagawa, Wami, coll. larvae on

Phellodendron amurense, em. 29. V. – 5. VI. 2010, S. Ibuki; 1 ♀ 1 ♂, Nakagawa, Koisago, coll. larvae on *Phellodendron amurense*, 5. VII. 2013, mat. 10. VII., em. 23–24. V. 2014, S. Ibuki.

Distribution. Japan: Honshu (Togashi, 1995). China: Fujian (Wei and Nie, 2003).

Bionomics. Host plants: Rutaceae: *Phellodendron amurense* Rupr. (Togashi, 1995).

In Nakagawa, Honshu, Japan, the gregarious larvae were collected in early July. They matured in late July and became adults in the following spring. This sawfly probably has a univoltine life cycle.

Remarks. *Arla* Malaise, 1957 is a small East Asian genus consisting of three species (Taeger *et al.*, 2010), *A. carbonaria* Malaise, 1957 from Vietnam, *A. evodiae* (Xiao, 1993) from Sichuan, China and *A. rufithorax*. The female of *A. carbonaria* is entirely black (Malaise, 1957) but the females of *A. evodiae* and *A. rufithorax* are black with the thorax widely orange. The male is known only for *A. evodiae* and *A. rufithorax*. Both are entirely black. *Arla evodiae* and *A. rufithorax* differ in the lancet and the penis valve. The rows of ctenidial setae of a lancet are extending to the ventral margin of a lancet in *A. evodiae* (fig. 1 in Xiao, 1993) but widely separated from the ventral margin in *A. rufithorax* (Fig. 3D, E). The penis valve is not concave on the dorsal margin in *A. evodiae* (fig. 3 in Xiao, 1993; dorsal is below) but concave on the dorsal margin near the apex in *A. rufithorax* (Fig. 3H).

Eutomostethus pilosus Seiyama, 1981

Eutomostethus pilosus Seiyama, 1981: 169; Abe and Togashi, 1989: 549; Taeger *et al.*, 2010: 326.

Material examined. HOKKAIDO: 3 ♂, Tokachi, Ashoro, Lake Onneto, 29. VII. 2011, H. Hara; 1 ♂, Tokachi, Shimizu, Nissho-toge, 26. VII. 2011, H. Hara; 1 ♀, same except 29. VII. 2011; 1 ♀ 1 ♂, same except 29. VII. 2012; 1 ♂, Kamikawa, Nayoro, Mt. Piyashiri-yama, 30. VI. 2012, A. Shinohara.

Distribution. Japan: Hokkaido (new record), Honshu (Seiyama, 1981).

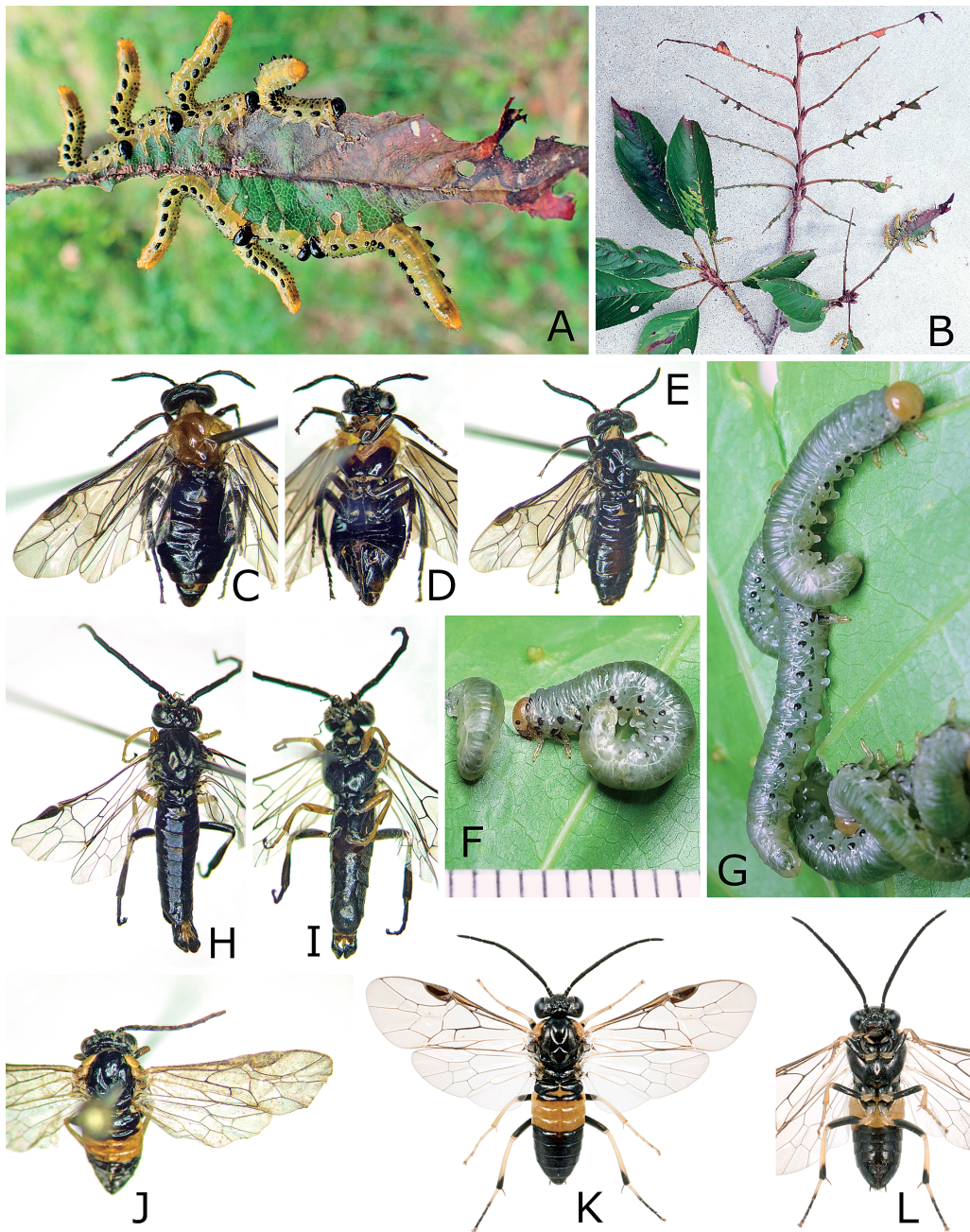


Fig. 1. A, B, Larvae of *Spinarge prunivora* on *Cerasus* $\times$ *yedoensis*. C, D, *Arla rufithorax*, female, dorsolateral and ventral views; E, same, male, dorsolateral view. F, G, Late instar larvae of *Mesoneura mikagei* on *Acer amoenum* var. *matsumurae*. H, I, *Nematus viburnum*, male, dorsolateral and ventrolateral views. J–L, *Pristiphora alboluteata*: J, Female, holotype, dorsal view; K, L, female, dorsal and ventral views. A, B, Mt. Takanawayama, 4. IX. 2017, photographed by A. Shinohara; C, D, Nakagawa; E, same; F, G, Mikasa, 11. VI. 2016, photographed by H. Hara (scales in B are 1 mm); H, I, Takayama; K, L, foot of Mt. Oginozen. K, L, photographed by F. Ito just after killing.

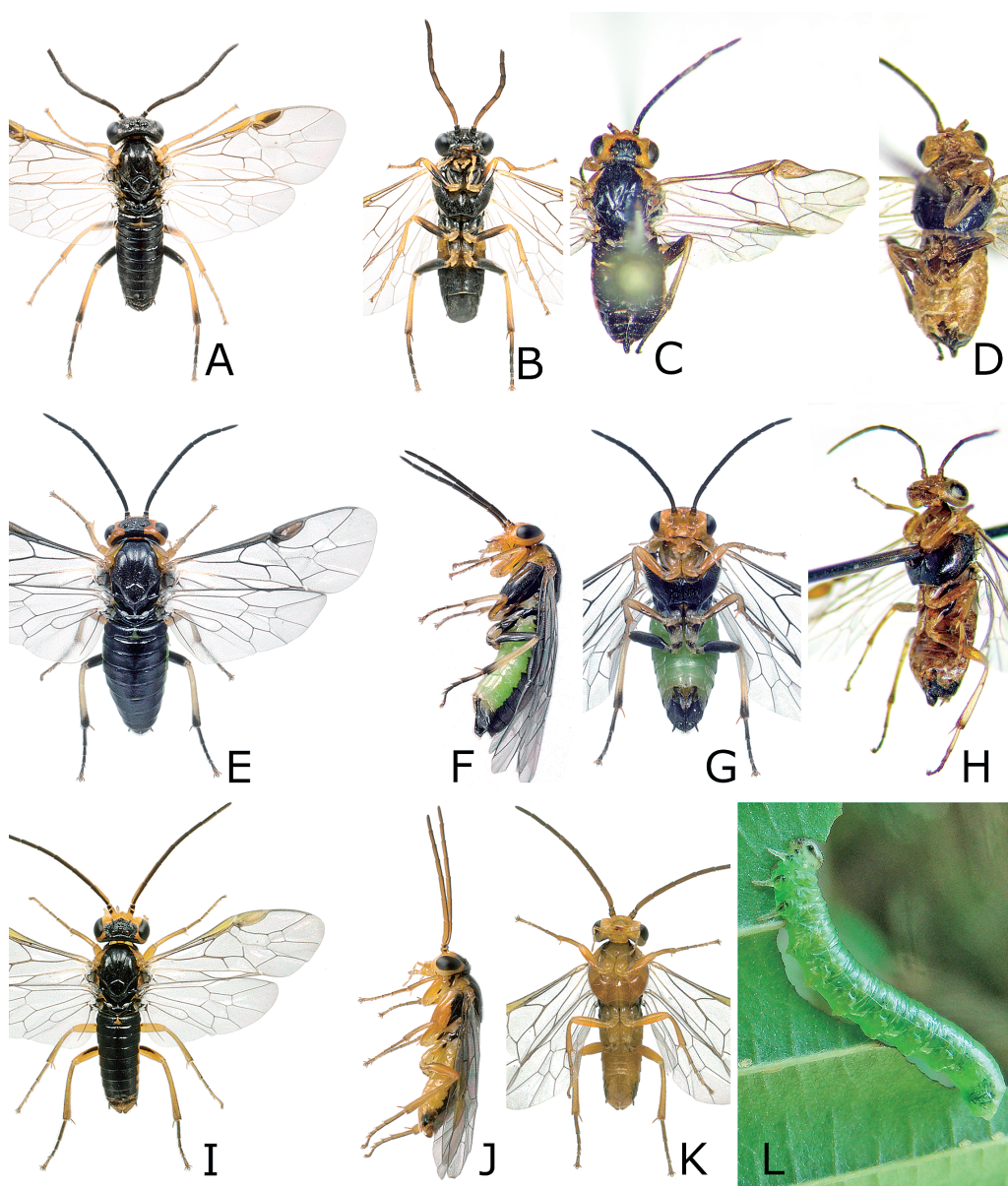


Fig. 2. A, B, *Pristiphora albobalteata*, male, dorsal and ventral views. C–L, *Pristiphora fulviceps*: C, D, Female, holotype, dorsal and ventral views; E–G, female, dorsal, lateral and ventral views; H, female, ventrolateral view; I–K, male, dorsal, lateral and ventral views; L, late instar larva on *Carpinus cordata*. A, B, Sayo; E–G, Nakagawa; H, Shintoku; I–K, Nakagawa; L, Nakagawa, 25. V. 2011, photographed by S. Ibuki. A, B, E–G, I–K, photographed by F. Ito just after killing.

Remarks. This is the first record from Hokkaido.

***Eutomostethus togashii* Seiyama, 1981**

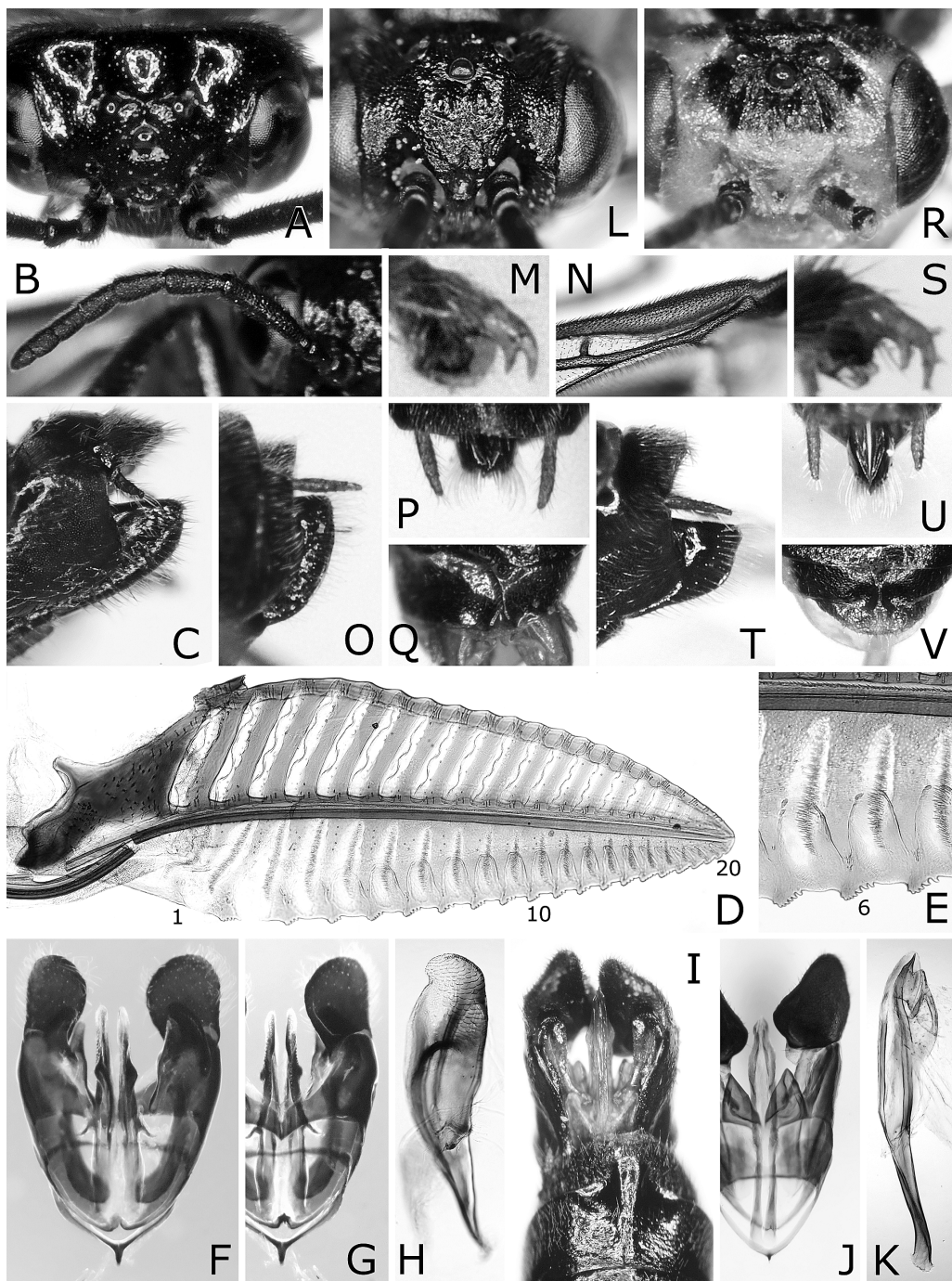
Eutomostethus togashii Seiyama, 1981: 163; Abe and Togashi, 1989: 549; Taeger *et al.*, 2010: 327.

Material examined. HOKKAIDO: 7 ♂, Toka-

chi, Ashoro, 29. VII. 2011, H. Hara; 1 ♂, Tokachi, Shikaoi, Yamada-onsen, 4. VII. 2012, H. Hara; 1 ♀, Tokachi, Shintoku, 14. VI. 2012, H. Hara; 1 ♀, Kamikawa, Higashikawa, Asahidake-onsen, 1. VII. 2012, H. Hara.

Distribution. Japan: Hokkaido (new record), Honshu (Seiyama, 1981).

Remarks. This is the first record from Hokkaido.



***Masaakia katayamai* Togashi, 2002**

Masaakia katayamai Togashi, 2002: 373; Taeger *et al.*, 2010: 332.

Material examined. HOKKAIDO: 1 ♀, Tokachi, Shimizu, Nissho-toge, 16. VI. 2012, H. Hara.

Distribution. Japan: Hokkaido (new record), Honshu (Togashi, 2002).

Remarks. This is the first record from Hokkaido.

***Masaakia longivaginata* Takeuchi, 1950**

Masaakia longivaginata Takeuchi, 1950: 18; Takeuchi, 1952a: 53; Abe and Togashi, 1989: 551; Taeger *et al.*, 2010: 332.

Material examined. HOKKAIDO: 1 ♀, Tokachi, Shikaoi, Yamada-onsen, 18. VII. 2011, H. Hara.

Distribution. Japan: Hokkaido (new record), Honshu (Takeuchi, 1950).

Remarks. This is the first record from Hokkaido.

***Mesoneura mikagei* Togashi, 1998**

(Fig. 1F, G)

Mesoneura mikagei Togashi, 1998: 35; Taeger *et al.*, 2010: 412; Wei *et al.*, 2013: 235.

Immature stages. Final feeding instar larva (? final instar larva) (Fig. 1F, G): Length about 15 mm; head pale brown; thoracic legs pale yellow gray, basally black; trunk greenish gray, laterally with black spots; thoracic legs five segmented; prolegs present on second to eighth and 10th abdominal segments; proleg of eighth segment small; third abdominal segment dorsally with sixth inconspicuous annulets; tenth abdominal tergum simple, without caudal protuberance,

with posterior margin rounded in dorsal view. Larval exuvia in cocoon (final instar larva): Clypeus with two pairs of setae; labrum symmetric, deeply concave apically, with two pairs of setae; mandible with two setae on lateral surface.

Cocoon: Length 8.5 mm, width 4.5 mm; blackish brown; double walled, tough; outer wall roughly fibrous; inner wall parchment like.

Material examined. HOKKAIDO: 1 ♀ and its cocoon, Mikasa, Kayano, 43°12'26"N 141°51'22"E, coll. 14 gregarious larvae (rearing code HH160611A) on *Acer amoenum* var. *matsumurae*, 11. VI. 2016, mat. 12–13. VI., em. 20. IV. 2017, H. Hara.

Distribution. Japan: Hokkaido (new record), Honshu (Togashi, 1998).

Bionomics. Host plants: Sapindaceae: *Acer amoenum* Carrière var. *matsumurae* (Koidz.) K. Ogata (new record).

In Hokkaido, gregarious late instar larvae were found in middle June on a few adjacent leaves. Under the rearing conditions, the larvae matured in middle June and entered the soil. One female adult emerged in the following spring. This sawfly has one generation per year and overwinters in a cocoon in the soil. We did not confirm whether the larva had an extra molt or not.

Remarks. This is the first record from Hokkaido and the first host plant record. The previously known host plants of *Mesoneura* Hartig, 1837 are *Quercus* and *Larix* (Liston, 2012; Wei *et al.*, 2013). *Acer* is recorded for the first time as a host plant for the genus.

***Mesoneura shishikuensis* Togashi, 1965**

Mesoneura shishikuensis Togashi, 1965: 1; Hara and Shinohara, 2017: 66. For more synonymy, see Hara and Shinohara, 2017.

Fig. 3. A–H, *Arla rufithorax* (A–E, female; F–H, male); I–K, *Nematus viburnum* (male); L–Q, *Pristiphora alboba-teata* (L–P, female; Q, male); R–V, *Pristiphora alboba-teata* (R–U, female; V, male). A, L, R, Head, dorsal (A) or anterodorsal (L, R) views; B, antenna, inner view; C, O, P, T, U, ovipositor sheath, lateral (C, O, T) and dorsal (P, U) views; D, ovipositor, lateral view (1, 10, 20, first (most basal), tenth, twentieth annulus); E, middle part of lancet (6, sixth annulus); F, G, J, genitalia, dorsal (F) and ventral (G, J) views; H, K, penis valve, lateral view (left dorsal); I, Q, V, apex of abdomen, dorsal view (genitalia removed in V); M, S, claw; N, cell Sc and its adjacent area of fore wing. A–E, Nakagawa; F–H, Nakagawa; I–K, Takayama; L, N, Shinonsen; M, Sasayama; O, P, Shikotsu-ko; Q, Sasayama; R, S, holotype; T, U, Nakagawa; V, Nakagawa. D, O, reversed.

Material examined. HOKKAIDO: 1 ♀, Tokachi, Shintoku, coll. larva 1. VI. 1991, em. III. 1992, Host: "*Quercus mongolica grosseserrata*" [= *Q. crispula*], H. Hara.

Bionomics. Host plants: Fagaceae: *Quercus crispula* Blume (new record).

A larva was collected in early June in Hokkaido. It overwintered in a cocoon in the soil and became an adult in the following spring under the rearing conditions. This sawfly has one generation a year.

Remarks. This is the first host plant record.

***Monophadnoides smithi* Togashi, 1980**

Monophadnoides smithi Togashi, 1980: 126; Togashi, 1984b: 66; Abe and Togashi, 1989: 551; Taeger *et al.*, 2010: 335.

Material examined. HONSHU: 1 ♀, Tochigi Pref., Nakagawa, Wami, coll. larva on *Rubus parvifolius* 15. VI. 2012, mat. 20. VI., em. 17. IV. 2013, S. Ibuki.

Bionomics. Host plants: Rosaceae: *Rubus mesogaeus* Focke (Togashi, 1984b), *R. parvifolius* L. (new record).

Remarks. *Rubus parvifolius* is recorded for the first time as a host plant of this species.

***Monsoma pallipes* (Matsumura, 1912)**

Poecilosoma pallipes Matsumura, 1912: 61.

Empria pallipes Takeuchi, 1952a: 36; Abe and Togashi, 1989: 548.

Monsoma pallipes: Prous *et al.*, 2011: 355.

Material examined. HONSHU: Gunma Pref.: 2 ♀, Minowa, 1000 m, Mt. Akagi-san, 17–20. V. 2001, A. Shinohara. — Nagano Pref.: 1 ♀, Niiyama-toge, 1200 m, Ina, 23–24. V. 2003, A. Shinohara. — KOREA: 1 ♀, Mt. Nogodan, 1200 m, Chirisan Mts., 26–28. V. 1997, A. Shinohara. — RUSSIA: PRIMORSKIJ KRAJ: 2 ♀, Anisimovka, 300 m, 29. V. –1. VI. 1994, A. Shinohara; 3 ♀, Pass, 500 m, 28 km NW of Partizansk, 13–14. VI. 1995, A. Shinohara.

Distribution. Japan: Hokkaido, Honshu (new record). Korea (new record) and Russia (Primor-

skij Kraj) (Prous *et al.*, 2011).

Remarks. This species was described from Hokkaido, Japan, and later recorded from Primorskij Kraj, Russia (Prous *et al.*, 2011). The specimens listed above represent the first records from Honshu and Korea. The five specimens examined from Primorskij Kraj are indistinguishable from those from Hokkaido, whereas the Korean specimen (only one available) has the stigma and veins slightly darker than those from Hokkaido and Primorskij Kraj. The legs of this Korean specimen are darkened, though some Hokkaido specimens also have such dark legs. On the other hand, the three Honshu specimens are appreciably darker than the specimens from other areas. The stigma and veins are blackish brown and the legs are largely marked with black. In the two specimens from Minowa, the pale brown or creamy white marks on the head, thorax and abdomen are reduced, though the color pattern is basically the same as the Hokkaido specimens. In one specimen from Niiyama-toge, the head capsule and thorax are all black, except for the dorsal part of the pronotum and most of the tegula. The richly pale-marked head is characteristic of *M. pallipes* and Prous *et al.* (2011) regarded it as the most useful character for distinguishing *M. pallipes* from the other three congeneric species. Here we treat the three Honshu specimens as *M. pallipes* but their systematic position should be revised when more material becomes available.

***Nematus viburnum* Hara, 2017**

(Figs. 1H, I, 3I–K)

Nematus viburnum Hara, 2017: 62.

Description, male (hitherto undescribed) (Fig. 1H, I). Differing from female as follows except for usual sexual differences.

Length 8.0–9.0 mm. Legs black; trochanters ventrally brown apically; fore femur mostly brown; middle femur dark brown, posteriorly and ventrally brown; hind femur ventrally brown basally; fore and middle tibiae ocher, basally

slightly whitish; basal third of hind tibia white; fore and middle tarsi ocher, apically slightly darkened; tibial spurs yellow ocher, hind ones dark brown; claws brown. Abdomen black entirely or with anterior parts of third and fourth segments brown.

Depth of apical emargination of clypeus $1.0\text{--}2.5 \times$ median height of clypeus. Antenna with first flagellomere $0.8\text{--}0.9 \times$ as long as eye height; second flagellomere $1.3\text{--}1.4 \times$ as long as first. Inner tooth of claw sometimes not curved. Seventh abdominal sternum weakly concave on posterior margin. Procidentia distinctly protruding posteriorly, in dorsal view widely rounded apically (Fig. 3I). Subgenital plate apically rounded, $0.6\text{--}0.7 \times$ as long as hind tibia. Male genitalia (Fig. 3I, J): Valvispina spine like and paravalva convex apically below valvispina (Fig. 3K).

Variation. In the additional material (1 ♀ 13 ♂), the anterior depressed area of the metepisternum is not or slightly narrowing dorsally.

Material examined. HONSHU: Nagano Pref.: 1 ♀ 13 ♂, Takayama, Maki, $36^{\circ}39'N$ $138^{\circ}26'E$, 22. V. 2017, A. Shinohara.

Remarks. *Nematus viburnum* belongs to the species group of *N. lucidus* (Panzer, 1801) characterized by the right mandible with the anterior surface abruptly sunk at the apical third and the left mandible without an inner tooth (Hara, 2017). This group contains only *N. viburnum* and *N. lucidus*. Their males are quite different in coloration (compare Fig. 1H, I with the images of *N. lucidus* in Anonymous, 2017a).

Pristiphora albobalteata Takeuchi, 1933

(Figs. 1J–L, 2A, B, 3L–Q, 4)

Pristiphora albobalteata Takeuchi, 1933: 32; Takeuchi, 1952a: 71; Abe and Togashi, 1989: 554; Naito *et al.*, 2004: 27; Haris, 2006: 202, 215; Taeger *et al.*, 2010: 465.

Redescription, female (Fig. 1J–L). Length 4.0–6.0 mm. Black. Vertex with or without brown spot near eye. Supraclypeal area often medially

brown. Clypeus brown to dark brown, often becoming pale dorsolaterally. Labrum entirely pale yellow, or brown, apically yellow. Mandible apically widely brown. Palpi pale yellow, basally darkened. Thorax yellow on wide posterodorsal area of pronotum and tegula; postspiracular sclerite yellow, sometimes anteriorly darkened. Legs pale yellow or white on apices of coxae, trochanters, trochantelli, narrow apices of femora, fore and middle tibiae and tarsi, hind tibia except for apical fourth to fifth, and hind first tarsomere except for apical half to fourth; spurs yellow, hind one dark brown; claws brown. Most of wing veins and stigma dark brown; in fore wing, veins C, Sc, R + M and R1 yellow brown to dark brown, and narrow base of vein C, wide base of vein Sc and wide base of vein A pale yellow. Abdomen pale yellow to reddish yellow on second to fourth segments except for anterior area of second tergum in Honshu specimens (14 ♀), on posterior area of first tergum and from second segment to anterior area of fifth segment in Hokkaido specimen (1 ♀). Cercus brown to dark brown.

Head in dorsal view not dilated behind eye, with length behind eye $0.2\text{--}0.3 \times$ eye length. Postocellar area with width $2.0\text{--}2.2 \times$ median length; anterior margin widely convex anteriorly beyond posterior end of lateral ocellus in dorsal view; anterior furrow narrow; lateral furrow short. Head with length behind lateral ocellus $1.5\text{--}2.0 \times$ length of lateral ocellus. OOL:POL:OCL = $0.8\text{--}0.9:1.0:0.4\text{--}0.7$. Head in lateral view with eye height about $5\text{--}6 \times$ distance from dorsal margin of eye to dorsal most point of head. Frontal area raised, posteriorly with pair of weak convexities (Fig. 3L); lateral margin dull, nearly parallel or slightly converging to another anteriorly, not ridged. Area just above dorsal tentorial pit without transverse ridge. Frontal pit circular or horizontally long oval, sometimes weak (Fig. 3L). Frontal crest inconspicuous. Edge of torulus ridged only on narrow dorsomedial area and narrow ventrolateral area. Inner margins of eyes slightly converging ventrally (Fig. 3L). Distance between eyes at

anterior tentorial pit $1.1\text{--}1.2 \times$ eye height. Clypeus slightly or weakly emarginate apically; depth of apical emargination $0.2\text{--}0.4 \times$ median height; width $3.3\text{--}3.9 \times$ maximum height; maximum height $0.6\text{--}0.7 \times$ torulus height. Malar space $0.8\text{--}0.9 \times$ as wide as median ocellus. Antenna $2.1\text{--}2.3 \times$ as long as head width (Fig. 1K); first flagellomere length $0.8 \times$ eye height, $0.9\text{--}1.1 \times$ second flagellomere length. Each mandible with one inner tooth. Apical maxillary palpomere $1.0\text{--}1.2 \times$ as long as torulus height.

Notaulus distinct. Mesoscutellar appendage length $1.3\text{--}1.5 \times$ short diameter of cenchrus. Prepectus very small or very narrow. Epicnemium much wider than mesothoracic spiracle height; epicnemial groove faint or inconspicuous. Mesepisternum including epicnemium without groove along anterior margin. Anepimeron not sunken posteriorly, and divided from katepimeron by weak groove; katepimeron bare. Anterior fore tibial spur with velum. Claws each with large inner tooth (Fig. 3M); depth of concavity between teeth about as long as distance between teeth. Fore wing with cell Sc less than $0.1 \times$ as wide as vein C including its marginal lamella at base of vein Rs + M (Fig. 3N).

Hypopygium usual, with posterior margin weakly concave beside medial projection. Cercus slender, about $5 \times$ as long as wide, extending posteriorly beyond ovipositor sheath (Fig. 3O, P). Ovipositor sheath in lateral view with dorsal margin straight, ventral margin, rounded and apex pointed, in dorsal view about $2\text{--}2.5 \times$ as wide as cercus, apically slightly emarginate and with short medial projection. Lance annulated on apical two-thirds; basal and middle annuli curved and weakly oblique (Fig. 4G). Lancet with large tangium and about 23–25 serrulae (Fig. 4A, C, E); ctenidia each one row of long setae; basal annular sutures dorsally widely separated from dorsal margin of lancet, ventrally curved basally; basal annuli ventrally lacking ctenidia; middle and apical annular sutures arched; apical annuli dorsally lacking ctenidia; serrulae low (Fig. 4B, D, F).

Head mostly rough, with anterodorsal area

widely weakly granulate; vertex except for ocellar area and clypeus smooth. Thorax mostly smooth and shiny, with inconspicuous punctures; pronotum microsculptured; mesoscutum except for posterolateral sunken area and mesoscutellar appendage with dense fine punctures; posterolateral sunken area of mesoscutum faintly microsculptured centrally; mesopostnotum laterally microsculptured, smooth on wide medial area. Abdomen reticulately microsculptured.

Description, male (hitherto undescribed) (Fig. 2A, B). Length 4.0–4.5 mm. Differing from female as follows, except for usual sexual differences. Flagellum dark brown, basally yellow ventrally. Fore and middle femora except for trochantelli brown yellow, dorsally and ventrally black, apically yellow; hind tibia narrowly darkened apically. Stigma dark brown, anteriorly yellow; in fore wing, veins C, R + M, R1 and A mostly yellow to yellow brown. Second to fourth abdominal segments dorsally black, reddish yellow on laterotergites and sterna.

Head with length behind lateral ocellus $1.4 \times$ length of lateral ocellus. Distance between eyes at anterior tentorial pit $1.0 \times$ eye height. Malar space $0.6 \times$ as wide as median ocellus. Antenna with setae uniform in size.

Subgenital plate widely rounded along posterior margin (Fig. 2B). Prociencia small, in dorsal view slightly protruding posteriorly (Fig. 3Q). Male genitalia (Fig. 4H, I): Parapennis long, pointed at apex; valvispina very long, arising from middle of ventral margin of valviceps (Fig. 4J, K); paravalva projecting above valvispina, about half as long as valvispina; pseudoceps straight, rounded at apex.

Material examined. Holotype: ♀, “22. IV. 1917 Minomo Takeuchi” “*Pristiphora albobalteata* Tak. Holotype”. Paratype: 1 ♀, “27, IV, 1916 Minomo Takeuchi”.

Other material examined: HOKKAIDO: 1 ♀, Lake Shikotsu-ko, 4–5. VI. 1999, A. Shinohara. — HONSHU: Tochigi Pref.: 1 ♀, Kanuma, Kusagyu, 5. V. 2005, T. Saito. — Niigata Pref.: 1 ♀, “Takane”, 3. V. 1983, I. Togashi, NSMT-HYM 62125. — Nagano Pref.: 1 ♀, Lake Nojiri-ko,

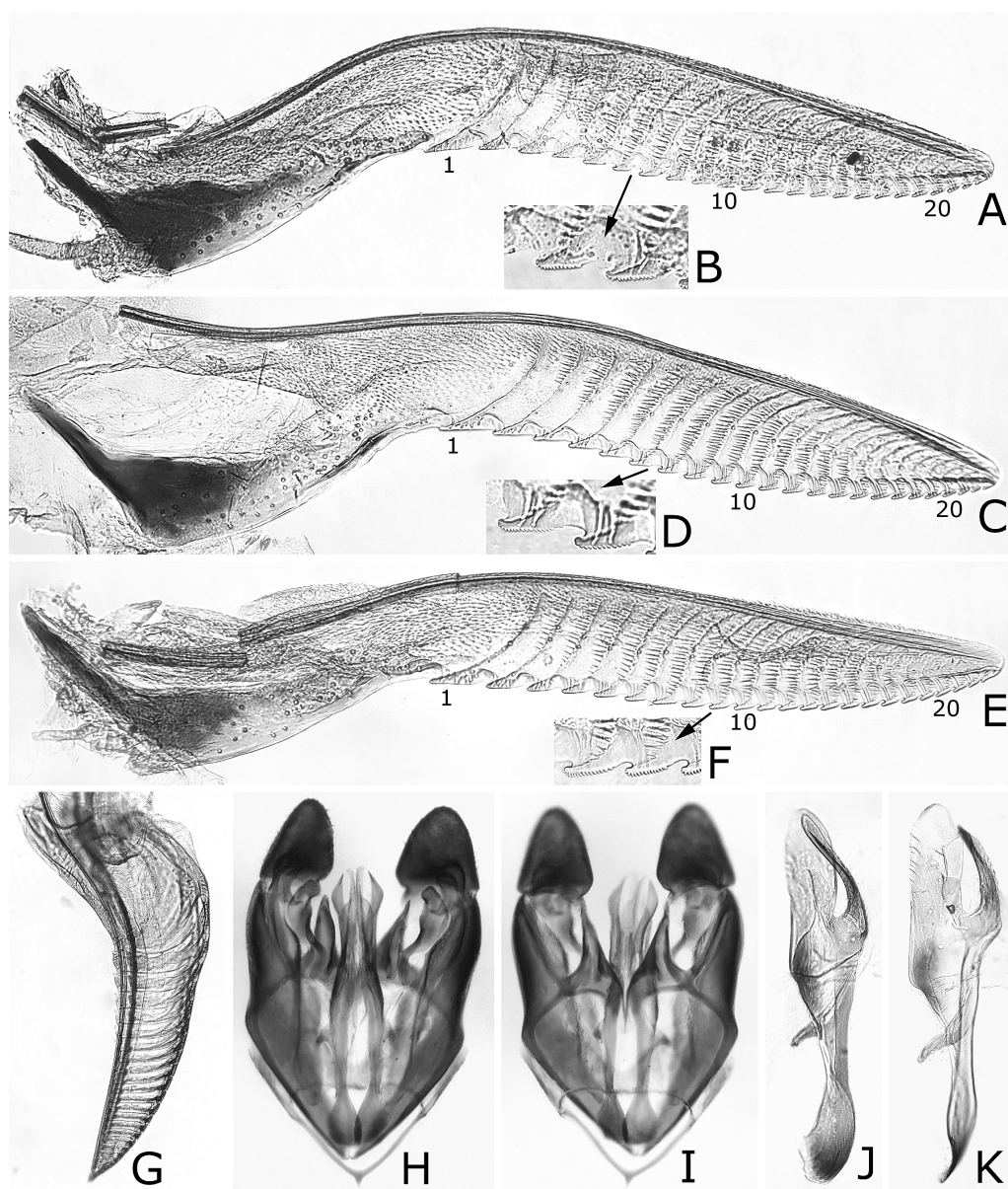


Fig. 4. *Pristiphora albobaletata*: A–F, Lancet and serrulae (1, 10, 20, first (most basal), tenth, twentieth annulus); G, lance; H, I, male genitalia, dorsal and ventral views; J, K, penis valve, lateral view (left dorsal). A, B, Holotype; C, D, Lake Shikotsu-ko; E, F, Sasayama; G, Shinonsen; H–J, Sayo; K, Sasayama. G, Reversed.

27. V. 1981, A. Shinohara, “*Pristiphora helvicincta* Togashi, n. sp. Holotype” (unpublished species), NSMT-HYM 62124. — Hyogo Pref.: 1 ♀, Sasayama, em. 16. IV. 1962, host: *Acer palmatum*, T. Naito; 2 ♀ 2 ♂, same except host: *Acer* sp. (partly cited by Naito *et al.*, 2004); 2 ♀, same except em. 15. IV. 1963; 1 ♀, Sasayama, 1.

V. 1968, T. Naito (cited by Naito *et al.*, 2004); 1 ♀, Sasayama, Mt. Koganegatake, 23. IV. 1961, T. Naito; 1 ♀, Shinonsen, Foot of Mt. Oginosen, 7. V. 2012, T. Naito; 1 ♂, Sayo, Mikazuki, 18. IV. 2012, T. Naito. — Locality unknown: 1 ♀, “Goshiki, 2120 525”, J. Yoshioka, NSMT-I-Hym 20214.

Distribution. Japan: Hokkaido (new record), Honshu (Takeuchi, 1933).

Bionomics. Host plant: Sapindaceae: *Acer* sp. (Naito *et al.*, 2004), *Acer palmatum* Thunb. (new record).

The adults were collected from mid April to late May in Honshu and in early June in Hokkaido.

Remarks. This is the first record from Hokkaido and the first definite record of the host plant.

Most Japanese species of *Pristiphora* Latreille, 1810 including *P. albobalteata* are externally separated from the species of the other Japanese nematine genera by the edge of a torulus not ridged at least in the dorsolateral fourth in addition to the short postocular area, the usually strongly swollen apex of the vein C of the fore wing and the truncate or weakly concave apical margin of the clypeus (*cf.* Prous *et al.*, 2014). Other Japanese nematine genera and some *Pristiphora* species, *e.g.* *P. mollis* (Hartig, 1837), have the edge of a torulus ridged throughout or except for narrow dorsal area.

From the Japanese congeners having the dorsolaterally widely non-ridged torulus edge, *P. albobalteata* is distinguished by the following characters: Black; pronotum widely yellow posterodorsally (Figs. 1J, K, 2A); abdomen black narrowly on base and widely on apex, and yellow to reddish yellow on middle in female (Fig. 1J–L), black, ventrobasally yellow in male (Fig. 2A, B); epicnemial groove faint or inconspicuous; mesepisternum smooth between inconspicuous punctures, without groove along anterior margin; mesopostnotum medially widely smooth; fore wing with vein C apically strongly swollen and cell Sc less than $0.1 \times$ as wide as vein C at base of vein Rs + M (Fig. 3N); claws each with large inner tooth and depth of concavity between teeth about as long as distance between teeth (Fig. 3M).

In the female and male keys to North-Western Palearctic species of *Pristiphora* by Prous *et al.* (2017), the female of *P. albobalteata* will go to couplet 65 containing *P. depressa* (Hartig, 1840)

and *P. tetrica* (Zaddach, 1883), and the male of *P. albobalteata* goes to *P. tetrica* (Zaddach, 1883). However, they are quite different in coloration (compare Figs. 1J–L and 2A, B with the images of *P. depressa* in Anonymous, 2017b and the images of *P. tetrica* in Anonymous, 2017c). The lancet is relatively obtuse apically and the ctenidial setae are long in *P. albobalteata* (Fig. 4A, C, E) but the lancet is acute apically and the ctenidial setae are short in *P. tetrica* and *P. depressa* (figs. 184 and 186 in Prous *et al.*, 2017). The pseudoceps is straight in *P. albobalteata* (Fig. 4J, K) but it is curved in *P. tetrica* (fig. 301 in Prous *et al.*, 2017; the male of *P. depressa* is unknown according to Prous *et al.*, 2017).

In the keys to the Palearctic species of *Pristiphora* by Haris (2006), the female of *P. albobalteata* will run to this species. The hitherto unknown male of *P. albobalteata* goes to the first section of couplet 13 of Table O containing *P. cretica* Schedl, 1981, *P. pallidiventrtris* (Fallén, 1808) and *P. sauteri* Rohwer, 1916, but the penis valve distinctly differs from those of the latter three (compare Fig. 4J, K with figs. 94, 140 and 144 in Haris, 2006).

Pristiphora fulviceps Takeuchi, 1933

(Figs. 2C–L, 3R–V, 5)

Pristiphora fulviceps Takeuchi, 1933: 34; Takeuchi, 1952a: 71; Abe and Togashi, 1989: 554; Haris, 2006: 205, 233; Taeger *et al.*, 2010: 466.

Redescription, female (Fig. 2C–H). Length 4.5–5.5 mm. Head yellow, black on dorsomedial area and occiput. Antenna black; scape and pedicel ventrally yellow; flagellum ventrally brownish. Mandible apically dark brown. Thorax black, yellow on pronotum except for medial area, tegula, postspiracular sclerite and propleuron except for dorsal area; prosternum yellow, often mostly brown. Mesepisternum black, with epicnemium sometimes dark brown in Honshu specimens (Fig. 2F), with brown marking extending from epicnemium to ventral end of mesepimeron in Hokkaido specimens (Fig. 2H). Legs yellow; in Honshu specimens (Fig. 2C–G), fore leg with

coxa narrowly black laterobasally, trochanter and trochantellus sometimes partly brown, femur sometimes black dorsobasally, tibia brown at narrow apex, tarsus brown dorsally and apically, middle leg with coxa basally black, trochanter and trochantellus partly brown to dark brown, femur brown, dorsally and ventrally black, tibia brown at narrow apex, tarsus brown dorsally and apically, and hind leg as middle leg but with femur black, tibia black on apical fourth and tarsus black except for venter of first tarsomere; in Hokkaido specimens (Fig. 2H), legs mostly yellow, black on narrow laterobasal areas of fore and middle coxae, wide base of hind coxa and dorsobasal area of hind femur, and darkened at narrow apices of tibiae and apices of tarsi; tibial spurs yellow; claws yellow brown. Wing veins dark brown to black; in fore wing, veins C, Sc, R + M and R1 brown, base of vein A pale yellow; stigma brown to dark brown. Abdomen black dorsally and apically; laterotergites and sterna yellow (pale green in life) and base of ovipositor sheath yellow or brown.

Head in dorsal view not dilated behind eye, with length behind eye $0.2\text{--}0.3 \times$ eye length. Postocellar area with width $2.3\text{--}2.7 \times$ median length; anterior margin widely convex anteriorly up to posterior end of lateral ocellus; anterior furrow wide; lateral furrow very short or punctiform. Head with length behind lateral ocellus $1.6\text{--}2.0 \times$ length of lateral ocellus. OOL:POL:OCL = $0.7\text{--}0.9:1.0:0.6\text{--}0.8$. Inner margins of eyes slightly diverging ventrally (Fig. 3R). Distance between eyes at anterior tentorial pit $1.4\text{--}1.6 \times$ eye height. Head in lateral view with eye height about $5\text{--}6 \times$ distance from dorsal margin of eye to dorsal most point of head. Frontal area slightly raised (Fig. 3R); lateral margins diverging anteriorly, straight and slightly ridged. Area just above dorsal tentorial pit without transverse ridge. Frontal pit distinct, lying in V-shaped ridge (Fig. 3R). Edge of torulus ridged only in narrow ventrolateral area. Clypeus scarcely or slightly emarginate apically; depth of apical emargination $0.1\text{--}0.3 \times$ median height; width $3.5\text{--}4.5 \times$ maximum height; maximum

height $0.8 \times$ torulus height. Malar space $1.2\text{--}1.5 \times$ as wide as median ocellus. Antenna $2.1\text{--}2.3 \times$ as long as head width (Fig. 2C, E); first flagellomere length $0.8\text{--}0.9 \times$ eye height, $1.0\text{--}1.1 \times$ second flagellomere length. Each mandible with one inner tooth. Apical maxillary palpomere $1.0\text{--}1.1 \times$ as long as torulus height.

Notaulus weak. Mesoscutellar appendage length $1.2\text{--}1.5 \times$ short diameter of cenchrus. Prepectus very narrow. Epicnemium wider than height of mesothoracic spiracle; epicnemial groove inconspicuous (but suture visible inside). Mesepisternum including epicnemium without groove along anterior margin (but suture visible inside). Anepimeron not sunken posteriorly, divided from katepimeron by inconspicuous groove; katepimeron bare or with some setae along posterior margin. Anterior fore tibial spur with velum. Claws each with large inner tooth (Fig. 3S); depth of concavity between teeth about as long as distance between teeth. Fore wing with cell Sc less than $0.1 \times$ as wide as vein C including its marginal lamella at base of vein Rs + M as in Fig. 3N.

Hypopygium usual, with posterior margin slightly concave beside medial projection. Cercus slender, about $5 \times$ as long as wide, not extending posteriorly beyond ovipositor sheath (Fig. 3T, U). Ovipositor sheath in lateral view with dorsal margin nearly straight, ventral margin distinctly convex roundly, slightly concave near apex and apex narrowly rounded, in dorsal view about $2 \times$ as wide as cercus and pointed apically. Lance annulated on apical two-thirds; basal and middle annuli curved and weakly oblique (Fig. 5E). Lancet distinctly curved, about 21–23 serrulae (Fig. 5A, C); ctenidia each one row of minute setae; basal annuli ventrally lacking ctenidia, with annular sutures nearly straight, dorsally extending near dorsal margin of lancet; apical annular sutures arched; apical annuli dorsally lacking ctenidia; serrulae weakly convex (Fig. 5A–D).

Punctures inconspicuous or fine. Head microsculptured dorsally and behind eye, without distinct punctures and granules. Thorax mostly

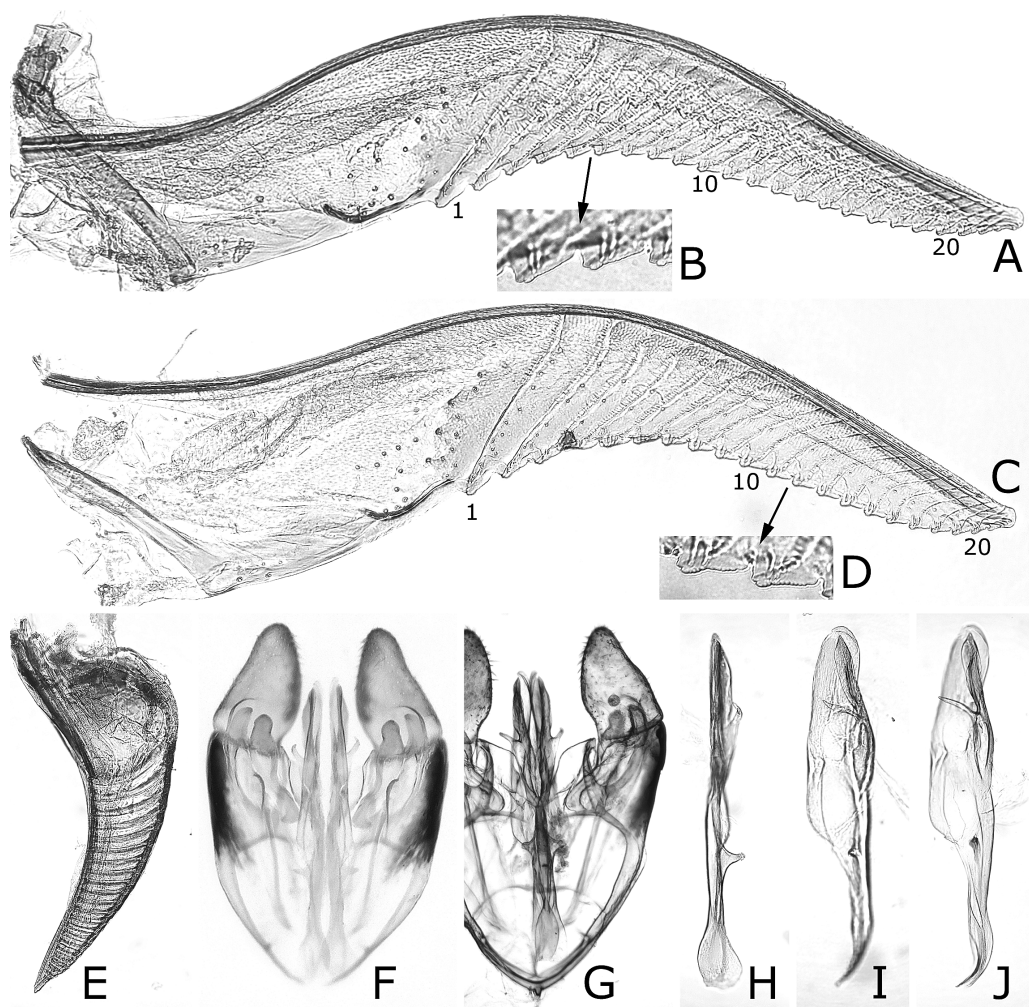


Fig. 5. *Pristiphora fulviceps*: A–D, Lancet and serrulae (1, 10, 20, first (most basal), tenth, twentieth annulus); E, lance; F, G, male genitalia, dorsal and ventral views; H, penis valve, dorsal view; I, J, penis valve, lateral view (left dorsal). A, B, E, Holotype; C, D, Shintoku; F–J, Nakagawa. A, B, Reversed.

smooth; pronotum microsculptured; posterolateral sunken area of mesoscutum weakly microsculptured centrally; mesopostnotum laterally microsculptured, medially smooth. Abdomen reticulately microsculptured.

Description, male (hitherto undescribed; only Honshu specimens) (Fig. 2I–K). Length 4.5 mm. Differing from female as follows, except for usual sexual differences. Flagellum yellow ventrally. Mesepisternum yellow except for narrow posterodorsal area. Metepisternum yellow, darkened anteriorly. Metepimeron centrally brown. Legs yellow; coxae each with black spot latero-

basally; fore and middle femora except for trochantelli each with black spot dorsobasally; hind femur except for trochantellus and apex dorsally black; hind trochanter and trochantellus partly darkened; tarsi dorsally darkened. Wing veins yellow to brown; stigma yellow to pale brown; in fore wing, veins C, Sc, R+M and R1 yellow to pale brown, base of vein A nearly colorless. Abdomen ventrally yellow.

Antenna $2.4\text{--}2.6 \times$ as long as head width; setae of antenna uniform in size.

Subgenital plate widely rounded along posterior margin (Fig. 3V). Procidentia small, slightly

protruding posteriorly in dorsal view. Genitalia Fig. 5F, G; parapennis with medial margin distinctly convex, pointed apically; valvispina long and nearly straight, arising from middle of ventral margin of valviceps (Fig. 5I, J); paravalva slender lobe like, arising from base of valvispina, projecting laterodorsally (Fig. 5F, J); pseudoceps nearly straight, rounded at apex.

Immature stages. Late instar larva (Fig. 2L): Length about 10 mm; light green; head with vertical black band laterally; coxae partly black; claws brownish; prolegs present on second to seventh and tenth abdominal segment; tenth abdominal tergum simple.

Material examined. Holotype: ♀, “10, V, 1931 Kibune Takeuchi” “*Pristiphora fulviceps* Tak. Holotype”.

Other material examined: HOKKAIDO: 1 ♀, Tokachi, Shintoku, 24. V. 1993, H. Hara; 1 ♀, Mikasa, nr. Ichikishirigawa, 31. V. 1999, A. Shinohara. — HONSHU: Tochigi Pref.: 1 ♀ 1 ♂, Nakagawa, Bato, coll. larvae on *Carpinus cordata*, 25. V. 2011, mat. 28–30. V., em. 10. IV. 2012, S. Ibuki; 1 ♂, Nakagawa, Bicchuzawa, coll. larva on *Carpinus cordata*, 21. V. 2012, mat. 28. V., em. 4. IV. 2013, S. Ibuki; 1 ♂, same except coll. larva 30. V. 2012, mat. 1. VI., em. 4. IV. 2013. — Tottori Pref.: 1 ♀, Mt. Daisen, Yokotemichi, 20–25. V. 2000, A. Shinohara.

Distribution. Japan: Hokkaido (new record), Honshu (Takeuchi, 1933).

Bionomics. Host plant: Betulaceae: *Carpinus cordata* Blume (new record).

Adults were collected in middle and late May in Honshu and late May in Hokkaido. Larvae were solitary leaf feeders. They were collected in late May in Honshu, and became adults in the following spring under rearing conditions. This sawfly has a univoltine life cycle.

Remarks. This is the first record from Hokkaido and the first record of the host plant for *P. fulviceps*.

Pristiphora fulviceps is one of the typical Japanese congeners having the dorsolaterally widely non-ridged torulus edge like *P. albobalteata* (see under the remarks of that species for more

details). *Pristiphora fulviceps* will be distinguished from the related congeners by the following characters: Head yellow, black on dorso-medial area and occiput (Fig. 2C–K), with anterodorsal area microsculptured, not granulate and not punctured; inner margins of eyes slightly diverging ventrally (Fig. 3R); frontal pit lying in V-shaped ridge; mesepisternum smooth between inconspicuous punctures, without groove along anterior margin; border of anepimeron and kat-epimeron indistinctly grooved; mesopostnotum medially smooth; fore wing with vein C apically strongly swollen and cell Sc less than $0.1 \times$ as wide as vein C at base of vein Rs + M as in Fig. 3N; claws each with inner tooth large and depth of concavity between teeth about as long as distance between teeth (Fig. 3S).

In the keys to North-Western Palaearctic species of *Pristiphora* by Prous *et al.* (2017), the female of *P. fulviceps* goes to couplet 11 in the female key, but does not agree with either section, because the female of this species has subbifid claws (Fig. 3S) and a dorsally black and ventrally yellow abdomen (Fig. 2C–G). The male goes to couplet 8 in the male key, but does not agree with either section because of the different penis valve (Fig. 5I, J) and the combination of the predominantly yellow propleuron (Fig. 2J, K) and the subbifid tarsal claws (Fig. 3S).

In the keys to the Palaearctic species of *Pristiphora* by Haris (2006), the female of *P. fulviceps* runs to this species. The male was unknown to him. It goes to couplet 5 of Table N containing *P. memoriakaszabi* Haris, 2002 and *P. subarctica* (Forsslund, 1936). However, the male of *P. fulviceps* has a dorsally black and ventrally yellow body (Fig. 2I–K), while the male of *P. memoriakaszabi* has an entirely ochraceous body and the male of *P. subarctica* has a mostly black mesopleuron. Their penis valves are also different (compare Fig. 5I, J with figs. 132 and 161 in Haris, 2006).

The Honshu females (3 ♀) and Hokkaido females (2 ♀) are rather different in coloration; e.g. the hind femur is black in the former (Fig. 2G) but yellow in the latter (Fig. 2H). However,

they are quite similar structurally and their lancets are also identical (compare Fig. 5A, B and 5C, D). We here regard the Honshu and Hokkaido females as conspecific.

***Zaphymatocera nipponica* Togashi, 1984**

Zaphymatocera nipponica Togashi, 1984a: 443; Abe and Togashi, 1989: 558; Taeger *et al.*, 2010: 359.

Material examined. HOKKAIDO: 1 ♀, Tokachi, Shimizu, Nissho-toge, 22. VI. 2014, H. Hara.

Distribution. Japan: Hokkaido (new record), Honshu (Togashi, 1984a).

Remarks. This is the first record from Hokkaido.

Cephidae

***Janus piri* Okamoto and Muramatsu, 1925**

Janus piri Okamoto and Muramatsu, 1925: 10; Wei and Nie, 1996a: 6; Naito *et al.* 1998: 239.

Distribution. Korea, China (Wei and Nie, 1996a).

Remarks. Naito *et al.* (1998) included Japan in the distribution of this species without giving references or collection records. We were not able to find any specimens or collection records of this species from Japan. The above Japanese record of *J. piri* is a lapsus and here we exclude the species from the faunal list of Japan.

***Phylloecus agilis* (Smith, 1874)**

Cephus agilis Smith, 1874: 386.

Hartigia agilis: Abe and Togashi, 1989: 560; Wei *et al.*, 2006: 555; Lelej, 2012: 111.

Phylloecus agilis: Liston and Prous, 2014: 90.

Material examined. HOKKAIDO: 1 ♀, Iwamizawa, 1. VI. 2014, H. Hara.

Distribution. Japan: Hokkaido (new record), Honshu, Shikoku, Kyushu. China, Russian Far East (Abe and Togashi, 1989; Wei *et al.*, 2006; Lelej, 2012).

Remarks. This is the first record of *P. agilis* from Hokkaido.

***Sinicephus giganteus* (Enderlein, 1913)**

Janus giganteus Enderlein, 1913: 215.

Sinicephus giganteus: Maa, 1949: 25; Abe and Togashi, 1989: 560; Wei and Nie, 1996b: 20; Wei *et al.*, 2006: 555.

Material examined. RYUKYU ISLANDS: 1 ♀, Ishigaki-jima Is., Okinawa, 9. IV. 2014, M. Sugimoto.

Distribution. Japan: Honshu, Shikoku, Kyushu, Ryukyu Islands (new record). Korea, China (incl. Taiwan) (Abe and Togashi, 1989; Wei and Nie, 1996b; Anonymous, 2017d).

Remarks. This is the first record of *S. giganteus* and the family Cephidae from the Ryukyu Islands. Abe and Togashi (1989) included East Siberia and Korean Peninsula in the distribution of this species. We were not able to find any specimens or collection records of this species from Russia, and no subsequent authors, including Wei and Nie (1996b) and Lelej (2012), recorded the species from East Siberia. We consider the record of *S. giganteus* from East Siberia erroneous. A collection record of *S. giganteus* from Korea (Yangpyeong-gun, Gyeonggi-do) has been given on the internet (Anonymous, 2017d), though we found no other published collection records from Korea.

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