

Symydobius (Hemiptera, Aphididae) of Japan, with Descriptions of a New Species and a New Subspecies

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Abstract : Japanese species of the genus *Symydobius* are reviewed. Three species and a subspecies are recognized and two of them, *Symydobius quednau* and *S. alniarius nipponicus* are described here as new. The oviparous female of *S. alniarius alniarius* and the sexual forms of *S. kabae* are described. A key is given for the Japanese species of the genus.

Introduction

The genus *Symydobius* Mordvilko, 1894, is a small genus containing at present eleven species in the world (Remaudière G. and M. Remaudière, 1997, and Qiao, G. X. and G. X. Zhang, 2002). I had collected some aphids belonging to the genus *Symydobius* in 1958 and 1963 at the mountainous region of Kobe City, Hyogo Prefecture. These aphids were identified as three different species of the genus by Dr. F. W. Quednau, one of which is a new species, and the other two are *S. alniarius* (Matsumura) and *S. kabae* (Matsumura). The new species I will describe it in this paper using his kind suggestions. Furthermore I have found an other interesting aphid which is described here as a new subspecies. Brief descriptions of apterous oviparous female of *S. alniarius alniarius* and apterous oviparous female and

male of *S. kabae* have also been added in this paper.

A key is given for the separation of the species of *Symydobius* from Japan.

Type depositories. The holotypes and paratypes of all the new species and subspecies will be deposited in the collection of the National Institute for Agro-Environmental Sciences, Tsukuba, Japan.

Key to species of *Symydobius* from Japan

(Apterous viviparous female) (apterous-alate intermediate)

1. Pronotum and abdomen with papillae on the marginal sclerites 2
— Pronotum and abdomen without papillae on the marginal sclerites 3
2. Setae on body rather long, 0.088–0.146 mm, 2.2–3.65 times as long as basal diameter of antennal segment III; antennal segment III with 10–22 ciliate sensoria; antennal segment IV as long as or slightly shorter than V; ultimate rostral segment as long as or a little longer than hind tarsus II. On *Alnus firma* *S. quednau* sp. nov.
— Setae on body rather short 0.08–0.09 mm long, 2.0–2.09 times as long as basal diameter of antennal segment III; antennal segment III with 20–30 sensoria which are not ciliated, segment IV longer than V; ultimate rostral segment shorter than hind tarsus II. On *Betula platyphylla* *S. kabae* (Matsumura)
3. Antennal segment III with 25–71 elliptical ciliate sensoria, segment IV longer than V. *S. alniarius alniarius* (Matsumura)
— Antennal segment III with 0–32 circular or oval sensoria which are not ciliated, but somewhat indented marginally; length of segment IV subequal to V *S. alniarius nipponicus* subsp. nov.

(Alate viviparous female)

1. Pronotum and abdomen without papillae on marginal sclerites. Antennal segment III with 90–95 sensoria *S. alniarius alniarius* (Matsumura)

- Pronotum and abdomen with papillae on marginal sclerites. Antennal segment III with 27–57 sensoria 2
- 2. Antennal segment III with 30–44 sensoria, the longest seta about 3.64 times as long as basal diameter of the segment; ultimate rostral segment subequal to hind tarsus II; mesoscutellum with a few setae; cauda rather globose on distal half with 14–17 setae *S. quednavi* sp. nov.
- Antennal segment III with 38–57 sensoria, the longest seta about 1.7 times as long as basal diameter of the segment; ultimate rostral segment about 0.8 times as long as hind tarsus II; mesoscutellum without seta; cauda rounded at hind margin with about 22–27 setae
..... *S. kabae* (Matsumura)

1. *Symydobius alniarius alniarius* (Matsumura)

Yezocallis alniaria Matsumura, 1917 : 370–371.

Symydobius alniaria: Higuchi, 1972 : 68–69.

Symydobius alniarius : Blackman and Eastop, 1994 : 891; Remaudière and Remaudière, 1997 : 214.

Oviparous female : When cleared, body pale; dorsal bands, antennae, legs and rostrum pale brown. Head with about 60 setae on vertex, the longest one about 0.106 mm. Antennae about 0.86 times as long as body, segment III without secondary sensoria, proportionate length of antennal segments : III–100, IV–54, V–50, VI–25 + 20. Ultimate rostral segment about 0.88 times as long as hind tarsus II, with about 23 secondary setae. Hind tibiae a little swollen on basal half and with 17–30 scent plaques which are 0.015–0.018 mm in diameter; hind tarsus II with 5 secondary setae on ventral side. Abdominal tergite VIII with about 46 setae including marginal ones, the longest seta about 0.142 mm. Genital plate large, with about 135 setae. Gonapophyses 3,

each with 10-15 setae.

Measurements in mm. Body length 2.69; antennae 2.308; ultimate rostral segment 0.164, hind tibia 1.632; hind tarsus II 0.186; siphunculus 0.026; cauda 0.099.

Specimens examined. Many apterous and alate viviparous females taken at following localities: Hirayu, Hida, 12. VIII. 1959, ex *Alnus hirsta*, R. Takahashi leg.; Chitose City, Hokkaido, 23. IX. 1962, ex *Alnus hirsuta*, M. Sorin leg; Senju, Nikko, Tochigi Pref. ex *Alnus hirsuta*, M. Sorin leg.; Mt. Hakusan, Ishikawa Pref., 13. VII. 1980, ex *Alnus hirsute*, and 2. X. 2008. ex *A. japonica*, I. Togashi leg.; Shiga Plateau, Nagano Pref., 17. VII. 1987, ex *Alnus hirsuta*, M. Sorin leg.; 3 oviparous females taken at near Shikotsu lake, Hokkaido, 23. IX. 1962, ex *Alnus hirsta*, M. Sorin leg.

Host plant. *Alnus hirsuta*, *A. japonica*.

Distribution. Japan, Korea.

2. *Symydobius alniarius nipponicus* subsp. nov.

(Fig. 1)

Apterous viviparous female (Apterous-alate intermediate) : Body color reddish dark brown in life. When cleared head, antennal segments I and II, and hind legs blackish brown; antennal segments III-VI blackish brown except for basal halves of III-V which are pale brown; fore and middle legs brown; abdomen pale, tergite VIII with a dorsal band which is blackish brown. Head with 50-80 setae on vertex and 4-8 setae on front, the longest one about 0.117 mm and about 2.9 times as long as basal diameter of antennal segment III; ventral side of head with 25-40 setae on each side. Antennae 0.87-0.95 times as long as body; segment III smooth, with 0-32 sensoria which are extremely small, circular or oval, about 0.007-0.015 mm in diameter, not ciliated, but faintly indented marginally, with about 86-126 setae, the

longest seta about 0.095 mm, about 2.38 times as long as the basal diameter of the segment; basal part of segment VI with 15-26 setae; processus terminalis not narrowed basally; proportionate length of antennal segments : III-100, IV-46-47, V-46-48, VI-24 + 18-22. Ultimate rostral segment reaching hind coxae, about 0.88 times as long as hind tarsus II, with 26-30 secondary setae. Pronotum pale brown, roughly spinulose, with about 180 fine setae. Hind tibiae with many fine setae, the longest seta about 1.33 times as long as middle diameter of tibia; hind tarsal segment I without dorsal seta, with 7 setae on ventral side; hind tarsus II about 0.164 mm long, with a pair of dorsal and 5-6 ventral secondary setae. Abdominal tergites each with a faint spinal sclerite and many setae; tergites I-V each with 57-80 setae, the longest one about 0.073 mm; tergites VI and VII each with about 10-20 setae; VIII with about 31 setae including marginal ones, the longest seta about 0.12 mm; marginal sclerites of abdomen each with 15-24 setae and fused with spiracles. Siphunculi short, pale brown, almost smooth, bearing 3-4 setae on basal part. Cauda rounded, with 20-27 long setae, the longest one about 0.11 mm. Anal plate a little concave at hind margin, with about 55-66 setae. Abdominal setae on venter fine, about 0.044-0.091 mm long. Gonapophyses 2-3, each with 2-27 setae.

Measurements of the holotype in mm. Body length 2.087, width 1.058; width of head across eyes 0.522; antenna 1.911, III-0.735, IV-0.353, V-0.353, VI-0.176 + 0.132 ; ultimate rostral segment 0.147 ; hind femur 0.706, hind tibia 1.22, hind tarsus II 0.164; cauda in length 0.102.

Type series. Holotype : Apterous viviparous female : Myoko Plateau, Niigata Pref., 26. VIII. 1970, ex *Betula ermani*, M. Sorin leg. Paratypes : 15 apterous viviparous females and 10 larvae collected at the same data as the holotype; 5 apterae , Kawakami-mura, Gifu Pref., 21. VII. 1968, ex *Alnus firma*, M. Sorin leg.; 3 apterae and 1 larva, Hara-mura, Nagano Pref., 5. VIII. 1986, ex *Betula ermani*, M. Sorin leg.; 8 apterae and 8 larvae, Sugo-kogen,

Gifu Pref., 6. VIII. 1987, ex *Alnus maximowiczii*, M. Sorin leg.; 3 apterae and 3 larvae, Tainai, Kurokawa, Kitakanbara, Niigata Pref., 30. VIII. 1992, ex *Alnus pendula*, K. Baba leg.

Host plants. *Alnus firma*, *A. hirsuta*, *A. maximowiczii*, *A. pendula*, and *Betula ermani*.

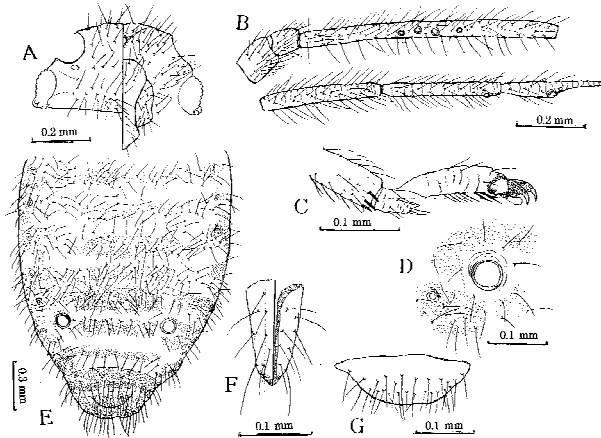


Fig. 1. *Symydobius alniarius nipponicus* subsp. nov.
Apterous viviparous female: A, Head; B, Antenna;
C, Hind tarsus; D, Cornicle; E, Abdomen; F, Ultimate
rostral segment; G, Cauda.

Distribution. Japan (Honshu).

Remarks: This subspecies is easily distinguished from the nominotypical subspecies by the antennal segment III without or with fewer and smaller sensoria which are circular or oval, not ciliated but faintly indented marginally, and the length of antennal segment IV subequal to V. From the descriptions of *S. paucisensorius* (Zhang et al. 1993, 2002) the new subspecies differs chiefly in the following characters: Marginal sclerites of abdomen without tubercles (*paucisensorius*: bears distinct, small marginal tubercles on the abdominal tergites), and siphunculi are pale and short (*paucisensorius*: siphunculi are black and truncated).

3. *Symydobius kabae* (Matsumura)

(Fig. 2)

Yezocallis kabae Matsumura, 1917 : 369.

Symydobius kabae : Shinji, 1941 : 349; Tao, 1963 : 53 & 1964 : 216; Higuchi, 1972 : 69; Zhang and Zhong, 1983 : 181; Zhang and Zhang, 1993 : 118; Blackman and Eastop, 1994 : 391; Remaudière and Remaudière, 1997 : 214; Qiao and Zhang, 2002 : 245; Jiang, Qiao, Zhang and Zhong, 2011 : 252.

Brief descriptions of sexual forms

Oviparous female : When cleared, body pale; head, antennae, rostrum and femora dark brown. Head with about 100 setae on vertex, longest one about 0.11 mm; frontal setae 0.102 mm long. Antennae about 0.74 times as long as body, segment III usually without secondary sensoria, but sometimes with 1-4 sensoria, and with 93-140 setae, the longest seta about 1.91 times as long as the basal diameter of the segment; basal part of VI with about 14 setae; proportionate length of antennal segments : III-100, IV-54, V-56, VI-26 + 15. Rostrum reaching beyond middle coxae, ultimate segment about 0.82 times as long as hind tarsus II, with about 22 secondary setae. Pronotum spinulose, with about 7 papillae on each marginal sclerites and 2 pairs of spinal ones. Hind tibiae (Fig. 2, C) are not modified, being similar to those of viviparous female, setae on hind tibia a little longer than middle diameter of the tibia, with 37-91 scent plaques which are small, about 0.015 mm in diameter; hind tarsal segment I with 0-2 dorsal setae and 7 setae on ventral side; segment II of hind tarsus with a pair of secondary setae on dorsal side and 6 secondary setae on ventral side. Abdomen pale, marginal sclerites each with 2-5 papillae; siphunculi dusky, spinulose, shorter than apical diameter, fused with marginal sclerite; spiracles separated from marginal sclerites;

tergite VIII with about 49 setae including marginal ones, the longest one about 0.128 mm. Cauda broadly rounded at hind margin with 32-40 setae. Genital plate much enlarged with about 150 setae. Gonapophyses (Fig. 2, D) 3, lateral ones well developed, each with 10-20 setae .

Measurements in mm. Body length 2.98; antennae 2.22; ultimate rostral segment 0.15; hind tibia 1.42; hind tarsus II 0.18; siphunculus 0.04; cauda 0.1.

Apterous male (Apterous-alate intermediate): Antenna (Fig. 2, A) : segment III with 25-31 secondary sensoria, IV without sensoria, V with 6-7 secondary sensoria on distal two-thirds; ultimate rostral segment about 0.8 times as long as hind tarsus II, with about 24 secondary setae; pronotum without papilla; siphunculi ring like, fused with marginal sclerite which has 3 papillae. On marginal sclerites of abdomen with 1-2 papillae on I-V segments, 4 papillae on VI, 5 on VII. Claspers (Fig. 2, B) blackish brown with rather long and numerous setae; aedeagus pale, without seta, about twice as long as basal width.

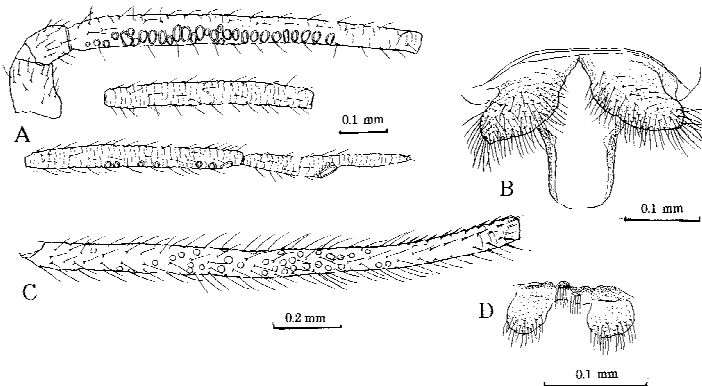


Fig.2. *Symydobius kabae* (Matsumura). Apterous male :
 A, Antenna; B, Male Genitalia; Oviparous female :
 C, Hind tibia; D, Gonapophyses.

Measurements in mm. Body length 2.06; antennae 1.91; ultimate rostral segment 0.14; hind femur 0.70, hind tibia 1.17, hind tarsus II 0.18; cauda 0.04.

Specimens examined. Alate and apterous viviparous females : Myoko Plateau, Niigata Pref., 25. VIII. 1970, ex *Betula platyphylla*, M. Sorin leg.; Daibosatsu Pass, Yamanashi Pref., 16. VII. 1971, M. Kono leg. Oviparous females : Nikko, Tochigi Pref., 3. X. 1971, ex *Betula* sp. M. Sorin leg.; Sexual forms : Kushiro, Hokkaido, 30. IX. 1995, ex *Betula platyphylla*, M. Sorin leg.

Host plants : *Betula platyphylla*; *Betula* sp.

Distribution : Japan; Korea; China.

4. *Symydobius quednau* sp. nov.

(Figs. 3 and 4)

Alate viviparous female (Fig. 3) : Body color when cleared: head, antennae, thorax and legs blackish brown; abdominal dorsal bands, siphunculi and cauda dark brown. Head almost smooth, frontal tubercles weakly concave, dorsofrontals each with 6-7 long setae. Vertex with about 36 fine long setae, the longest one about 0.142 mm and about 3.55 times as long as the basal diameter of antennal segment III. Antennae with numerous fine long setae; segment III with usually a single row of 30-40 elliptical ciliate secondary sensoria and about 82 long setae, the longest seta about 0.146 mm and about 3.64 times as long as the basal diameter of the segment; base of segment VI with 7-9 setae which are 0.04-0.102 mm long; processus terminalis a little narrowed basally. Proportionate length of antennal segments : III-100, IV-43, V-39, VI-15 + 11. Rostrum reaching between the fore and middle coxae; ultimate rostral segment subequal to hind tarsus II in length, with 22-26 secondary setae. Pronotum with over 100 setae and 4-7 small marginal papillae on each side and sometimes present spinal one. Mesoscutellum with 6-10 setae. Hind tibiae almost smooth with many fine setae, the longest one

about 3.22 times as long as the middle diameter of the tibia. First tarsal segment with 0-2 dorsal and 5-7 ventral setae. Second segment of hind tarsus about 0.157 mm long, with 2 dorsal and 4-5 ventral secondary setae. Empodial setae a little shorter than claws. Abdomen with spinopleural sclerites which are forming transverse bars. Tergites I and II each with about 40 setae; III-IV each with 45-51 setae; VI with 18-22, VII with 11-13; VIII with a dorsal band and 17-24 setae including marginal ones, the longest seta about 0.212 mm and about 5.3 times as long as the basal diameter of antennal segment III. Marginal sclerites of abdomen each with 15-29 setae and 1-4 papillae on anterior abdominal segments, but on segments VI and VII each with 15-16 setae and 1-3 papillae. Siphunculi a little sclerotic, about 0.055 mm long, with 4-5 setae on basal part, fused with marginal sclerite. Cauda deep brown, spinulose and a little globose on distal half, rather

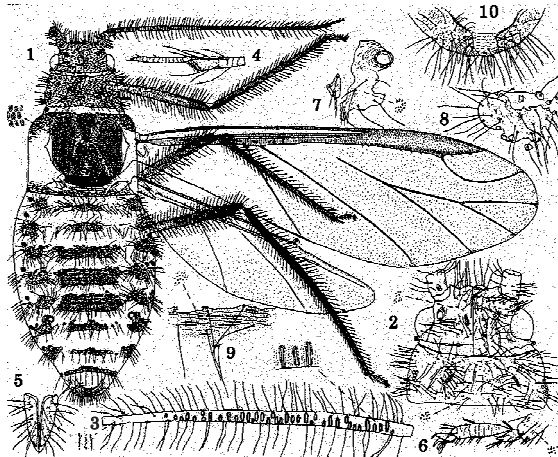


Fig. 3. *Symydobius quednau* sp. nov. Alate viviparous female :
 1, body; 2, head and pronotum; 3, antennal segment III ;
 4, antennal segment VI; 5, ultimate rostral segment; 6, hind
 tarsus; 7, siphunculus; 8, marginal abdominal sclerites;
 9, spinal abdominal sclerites and setae; 10, anal segment.
 (The original drawings kindly sent by Dr. Quednau)

knobbed, with 16-20 setae. Genital plate brown, spinulose, with 80-94 setae. Gonapophyses 4, each with 2-16 setae.

Measurements of the holotype in mm. Body length 3.42, width 1.332; width of head across eyes 0.648; antenna 2.268, III-1.058, IV-0.456, V-0.412, VI-0.162+0.118; ultimate rostral segment 0.153; hind femur 1.116, hind tibia 1.998, hind tarsus II 0.157; cauda in length 0.153.

Apterous viviparous female (Apterous-alate intermediate, sometimes alatform) (Fig. 4): Body colour when alive deep brown with blackish brown bands on the dorsum of abdomen. Colour when cleared: body pale or yellowish brown; head, antennae (except for basal halves of segments IV and V which are pale brown), rostrum and legs deep brown; dorsal band of abdominal tergite VIII, siphunculi, cauda and anal plate brown. Head almost smooth, frons weakly convex at middle; frontal setae fine, long, the longest seta about 0.146 mm. Cephalic setae fine, somewhat wavy, 0.088-0.146 mm long, about 2.2-3.65 times as long as the basal diameter of antennal segment III; posterior discals with about 24 setae, and ventral side of head with 17-19 setae on each side, those setae 0.073-0.11 mm long, and 1.8-2.9 times as long as that mentioned diameter. Antennae about 3.26 times as long as the width of head across eyes, and 0.76-0.8 times as long as body; segment III with 18-22 transverse oval and faintly ciliated secondary sensoria on basal two-thirds, and 55-65 setae which are fine, erect or somewhat wavy, the longest seta 0.106 mm, and 2.8 times as long as that diameter; IV with 32 setae; V-VI imbricated on distal parts, V with 33 setae; the basal part of VI 1.06-1.22 times as long as the processus terminalis with 9 long setae which are 0.058-0.069 mm long; proportionate length of antennal segments: III-100, IV-40, V-45, VI-19 + 17. Rostrum reaches to the middle coxae; ultimate segment nearly as long as hind tarsus II, with 22-26 secondary setae. Pronotum with about 100 setae and 4-7 small marginal papillae. Legs pale brown; hind tibia and tarsi blackish brown. Tibiae almost smooth with many

long setae, the longest one about 2.25 times as long as middle diameter of hind tibia. Tarsal segment I with 0-1 dorsal and 5-7 ventral setae; hind tarsus II about 0.15 mm long and 0.98 times as long as ultimate rostral segment, with 2 setae on dorsal side and 4-5 secondary setae on ventral side. Abdominal spinal sclerites forming small transverse band on tergites I-VI, pale brown or indistinct bands on tergites II-IV; I-V each with 44-60 setae; VI with 18-20 setae between siphunculi; VII with about 12-18 setae on the dorsal band; VIII with about 17-23 setae including marginal ones, the longest seta about 0.175 mm and about 4.36 times as long as basal diameter of antennal segment III. Marginal sclerites of abdomen spinulose, with 12-26 long fine setae on each segment, and with 0-4 small papillae on segments I-V and VII. Siphunculi small, sclerotic, short, about 0.018 mm long, with 3-4

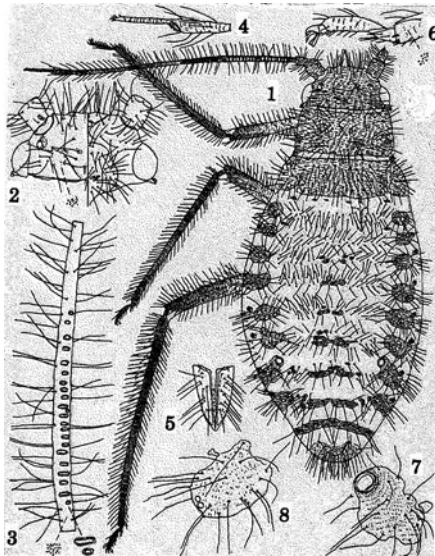


Fig. 4. *Symydobius quednau* sp. nov. Apterous viviparous female: 1, body; 2, head; 3, antennal segment III; 4, antennal segment VI; 5, ultimate rostral segment; 6, hind tarsus; 7, siphunculus; 8, marginal abdominal sclerite. (The original drawings kindly sent by Dr. Quednau)

setae on basal part. Cauda brown, bluntly protruding on distal half, with about 23 setae. Anal plate rounded at hind margin. Gonapophyses 3, each with 5-10 setae.

Measurements of the specimen in mm: Body length 2.455, width 1.147; width of head across eyes 0.573; antenna 1.867, III-0.779, IV-0.309, V-0.353, VI-0.147 + 0.132; ultimate rostral segment 0.15; hind femur 0.838, hind tibia 1.441, hind tarsus II 0.146; cauda in length about 0.066.

Type series. Holotype : Alate viviparous female, Mt. Futatabisan, near Kobe City, Hyogo Pref., 22. X. 1963, ex *Alnus firma*, M. Sorin leg. Paratypes : 13 alate viviparous females and 1 apterous viviparous female (intermediate) collected at the same data as the holotype; 3 alate viviparous females, 2 apterous viviparous females and 1 alate viviparous female, Mt. Mayasan near Kobe City, Hyogo Pref., 21. VIII. 1958, ex *Alnus firma*, M. Sorin leg.; 5 apterous viviparous females and 5 nymphs, Kawakami, Gifu Pref., 21. VII. 1968, ex *Alnus firma*, M. Sorin leg.; 1 alate viviparous female, Nenouye-kogen, Gifu Pref. 8. VIII. 1989, ex *Alnus* sp., M. Sorin leg.; 1 alate viviparous female and 4 nymphs collected from Mt. Hakusan, Ishikawa Pref., 22. VI. 2003, ex *Alnus pendula*, I. Togashi leg.

Host plant. *Alnus firma*, *A. pendula*, *A. sp.*

Distribution. Japan (Honshu).

Etymology : This new species is dedicated to Dr. F. W. Quednau, who is identify this species at first.

Remarks. The present new species differs from *S. alniarius alniarius* (Matsumura) in having longer setae on body, the antennal segment III with fewer sensoria, and in having in the alate morph a few setae on the mesoscutellum. This species resembles *S. paucisensorius* Zhang et Zhong in having papillae on the marginal sclerites, but differs from the original descriptions of the latter species, in having longer setae on body, antennal segment III with more sensoria, and abdominal tergite VIII with fewer setae.

Acknowledgments

I am much indebted to Dr. F. W. Quednau (Ste. Foy-Quebec, Canada) for his comments of the identity of the Japanese materials belonging to the genus *Symydobius*, and for giving permission to use his drawings, and critical reading the original manuscript of this paper. I am also grateful to Dr. M. Miyazaki (The National Institute of Agro-Environmental Sciences, Tsukuba, Ibaraki Pref.) for his great help with the loan of specimens, and other cooperation in many ways, and to Dr. I. Togashi (Tsurugi, Hakusan City, Ishikawa Pref.) for the gift of valuable specimens.

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摘 要

日本産ブチアブラムシ *Symydobius* の
1 新種および 1 新亜種

宗 林 正 人

ブチアブラムシ属 *Symydobius* Mordvilko は従来 11 種知られているが、そのうち日本からは 2 種知られていたに過ぎない。本文において、筆者が 1958 年神戸市の摩耶山と 1963 年に同じく神戸市の再度山で採集したアブラムシの 1 新種ヤシャブシブチアブラムシ *Symydobius quednau* sp. nov. 及び 1970 年新潟県妙高高原のダケカンバ及びその後他の地域および植物から採集した 1 新亜種ニッポンブチアブラムシ *S. alniarius nipponicus* subsp. nov. を記載した。併せてハンノブチアブラムシ *S. alniarius alniarius* (Matsumura) の産卵雌虫及びカバブチアブラムシ *S. kaba*e (Matsumura) の産卵雌虫と雄虫についても簡潔に記載した。

1. ヤシャブシブチアブラムシ *S. quednau* sp. nov.

有翅胎生雌虫：体長約 2.8~3.5mm. 体毛は長く 0.142~0.146mm. 体側斑紋上に微小な突起がある。触角第 3 節には長楕円形で縁毛のある二次感覚器を 30~44 個具える。後胸部に 7~8 本の毛がある。角状管長は約 0.05~0.073mm. 尾片は長く約 0.128~0.153mm で、先端は瘤状を呈し 13~18 本の長毛を生ずる。

無翅胎生雌虫：体長約 2.03~2.5mm. 体毛は約 0.088~0.146mm. 触角第 3 節には 10~22 個の二次感覚器を具える。角状管長は約 0.018~0.025mm. 尾片は僅かに突出して長さは 0.055~0.091mm, 毛は 17~27 本である。

寄主植物：ヤシャブシ *Alnus firma*, ヒメヤシャブシ *Alnus pendula*.

標型地：兵庫県神戸市, および石川県白山市.

2. ニッポンブチアブラムシ *S.alniarius nipponicus* subsp. nov.

無翅胎生雌虫：体長約 2.1mm. 頭部, 触角, 後脚, 腹部第 8 節帯状紋などは黒褐色. 体側斑紋に微小突起を欠く. 触角は体長よりも僅かに短く, 第 3 節に小円形または小卵形で縁毛のない二次感覚器を 0~32 個具える. 角状管は淡色で, 長さ約 0.037mm. 尾片は半円形で長毛を 15~27 本生ずる.

寄主植物：ダケカンバ *Betula ermani*, ヤシヤブシ *Alnus firma*, ヒメヤシヤブシ *Alnus pendula* およびヤマハンノキ *Alnus hirsuta*.

標型地：新潟県妙高高原及び黒川村胎内, 長野県原村, および岐阜県菅生高原.

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