A REVISION OF THE GENUS TAKECALLIS MATSUMURA
(HOMOPTERA : APHIDIDAE)

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The genus *Takecallis* Matsumura is a small group of the Callipterinae, being represented by several species, all of which might be Oriental or eastern Palaearctic in origin. On this occasion I will give a revision of the genus in the following pages.

I wish to express my sincere gratitude to Prof. C. Watanabe of the Hokkaido University for his continuous guidance and encouragement.

Genus ***Takecallis*** Matsumura

Takecallis Matsumura, Jour. Coll. Agr., Tohoku Imp. Univ. Sapporo 7(6): 373, 1917.

Type-species: (*Takecallis bambusae* Matsumura, 1917)=*Takecallis arundicolens* (Clarke, 1903).

This genus is closely related to the genus *Myzocallis*, but may be distinguished from the latter by the following characters:—Clypeus with a fingertip-like swelling; processus terminalis about equal to base of VI in length; rostrum short, reaching a little beyond fore coxae; 8th abdominal segment with 2-4 setae.

So far as their habits are known, the species of this genus attack plants belonging to the Bambusaceae.

Takecallis arundicolens (Clarke)

Callipterus arundicolens Clarke, Canad. Ent. 35: 249, 1903.

Takecallis bambusae Matsumura, Jour. Coll. Agr., Tohoku Imp. Univ. Sapporo 7(6): 373, 1917.

Myzocallis arundicolens: Swain, Univ. Calif. Publ. Ent. 3: 22, 1919; Takahashi, Proc. Ent. Soc. Wash. 28(7): 159, 1926; Theobald, The plant lice or Aphididae of Great Britain 2: 341, 1927; Shinji, Monog. Japan. Aphid.: 306, 1941.

Takecallis arundicolens: Hille Ris Lambers, Mitt. schwiz. ent. Ges. 20: 658, 1947; Tao, Q. Jour. Taiwan Mus. 17: 220, 1964; Stroyan, Trans. R. ent. Soc. Lond. 116: 34, 1964; Paik, Aphid. Korea: 49, 1965; Hille Ris Lambers, Tijdschr, Ent. 108: 202, 1965; Eastop, Aust. Jour. Zool. 14: 520, 1966.

On the basis of the specimens examined a redescription will be given below:—

Alate viviparous female. Body oblong, about 2.2 mm. in length including cauda. Head smooth, without antennal tubercles, with 4 pairs of ventral pointed setae 1.0-1.6 times as long as middle breadth of 3rd antennal segment. Antennae about 1.1 times as long as body including cauda; 1st segment with 4 pointed setae; 2nd segment with 2 pointed setae 0.8-1.2 times as long as middle breadth of 3rd antennal segment; 3rd segment somewhat imbricated, with 11-17 short pointed setae 0.4-0.6 times as long as its middle breadth. Relative length of antennal segments as follows: I-7.2, II-5.2, III-

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59.3, IV–39.3, V–36.0, VI–20.2+24.7. Secondary rhinaria 4–10 in number, arranged on black area of 3rd antennal segment. Rostrum short, reaching a little beyond fore coxae; ultimate segment about 0.7 times as long as 2nd segment of hind tarsus, with 8–12 setae, of which the longest one is 0.9–1.6 times as long as middle breadth of 3rd

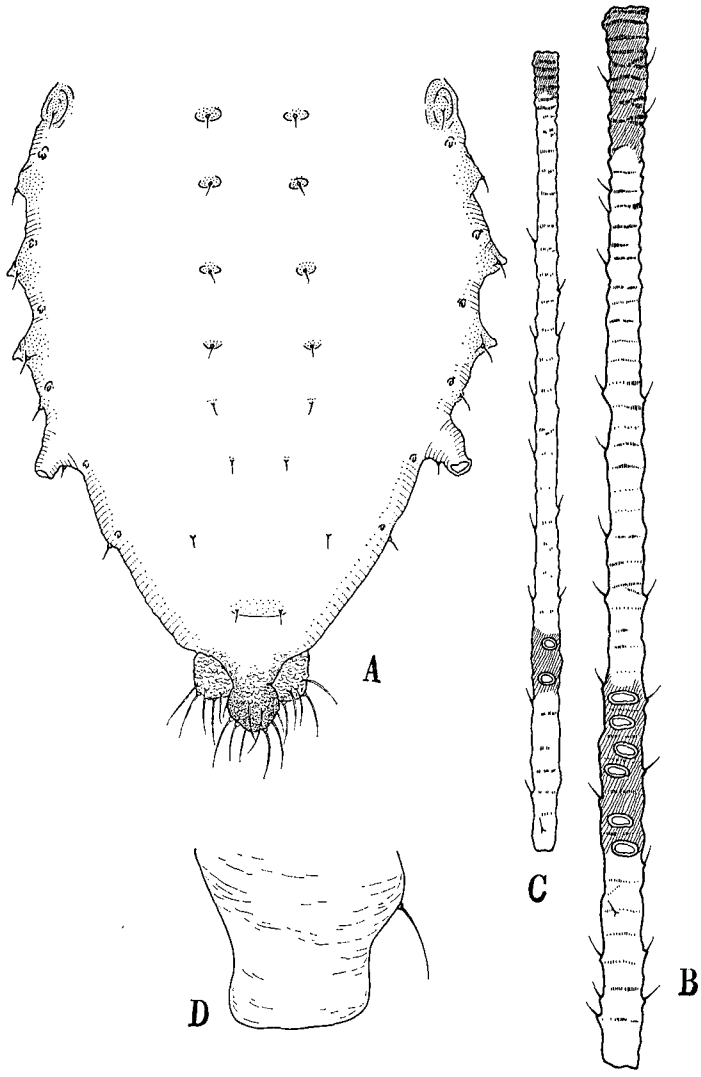

Fig. 1. *Takecallis arundicolens* (Clarke), alate viviparous female. A, abdomen; B, 3rd antennal segment (normal form); C, 3rd antennal segment; D, cornicle.

antennal segment; mandibular laminae with 1 or 2 setae. Hind tibiae with many pointed setae 0.6–1.2 times as long as its middle breadth, with 4 thick spines at apex. First segment of all tarsi with 9 setae. Abdomen with 1st–4th segments bearing

imbricated tubercles; 5th and following segments with tubercles often small and inconspicuous. Dorsal abdominal chaetotaxy essentially as in Fig. 1, A. Abdominal tubercles with a seta; 8th segment with 2–4 setae. Cornicle short, somewhat shorter than breadth, 0.4–0.6 times as long as 1st antennal segment, with a seta. Cauda knobbed, with 11–15 setae, of which the longest one is 2.6–3.6 times as long as middle breadth of 3rd antennal segment. Anal plate bilobed. Genital plate with 21–28 setae 0.8–1.6 times as long as middle breadth of 3rd antennal segment.

Specimens taken at Kamikôchi (altitude about 2000 m., 25–, 27–vii–67, H. Higuchi leg.), Nagano-ken, Honshu, differing from the normal form as follows:

(1) Third antennal segment with 2 or 3 (4–10 in normal form) secondary rhinaria (Fig. 1, C).

(2) Body about 1.9 mm. (2.2 mm.) in length including cauda.

(3) Cornicle 0.6–1.0 (0.4–0.6) times as long as 1st antennal segment.

Specimens examined. Many alatae taken from the following localities: —Japan: Hokkaido—Sapporo, 21–viii–17, S. Matsumura leg., 24–vii–56; Mt. Daisetsu, 25–vii–57, S. Takagi leg. Honshu—Morioka, Iwate-ken, 24–vi–67; Shirabutakayu, Yamagata-ken, 29–vi–67; Kinugawa, Tochigi-ken, 13–vii–67; Kamikôchi, Nagano-ken, 25–, 27–vii–67; Mt. Daisen, Tottori-ken, 25–viii–67, H. Higuchi leg. Europe: England–Kew, 8–v–61, V. F. Eastop leg.

Host plants: *Phyllostachys* sp., *Pleioblastus Chino* Makino, *Sasaella ramosa* Makino, *Sasa nipponica* Makino et Shibata & *Sasa paniculata* Makino et Shibata.

Distribution: Japan; Korea; Formosa; Europe; North America.

This species is readily distinguished from any other related ones by the following characters: (1) Body entirely pale except for black cauda. (2) Third antennal segment black on area of secondary rhinaria and on apex, the rest being pale yellow.

Takecallis arundinariae (Essig)

Myzocallis arundinariae Essig, Univ. Calif. Publ. Ent. 1: 302, 1917.

Myzocallis bambucifoliae Takahashi (sic), Agr, Exp. Sta. Govt. Formosa, Extra Rept. 20: 73, 1921.

Myzocallis arundinariae: Swain, Univ. Calif. Publ. Ent. 3: 24, 1919; Takahashi, Proc. Ent. Soc. Wash. 28(7): 159, 1926.

Agrioaphis bambusifoliae: Takahashi, Dept. Agr. Govt. Res. Inst. Formosa, Rept. 53: 84, 1931.

Takecallis arundinariae: Tao, Q. Jour. Taiwan Mus. 17: 220, 1964; Stroyan, Trans R. ent. Soc. Lond. 116: 34, 1964; Hille Ris Lambers, Tijdschr. Ent. 108: 202, 1965; Takahashi, Ins. Mats. 28(1): 58, 1965; Eastop, Aust. Jour. Zool. 14: 520, 1966.

Takecallis sasacola: Paik, Aphid. Korea: 49, 1965.

On the basis of the specimens examined a redescription will be given below: —

Alate viviparous female. Body oblong, about 2.0 mm. in length including cauda. Head with a longitudinal brown line, without antennal tubercles, with 4 pairs of ventral pointed setae 0.9–1.6 times as long as middle breadth of 3rd antennal segment. Antennae about 1.2 times as long as body including cauda; 1st segment with 4 pointed setae; 2nd segment with 2 pointed setae 0.7–0.9 times as long as middle breadth of 3rd antennal segment; 3rd segment imbricated, with 13–19 short pointed setae 0.4–0.6 times as long as its middle breadth. Relative length of antennal segments as follows: I–6.1, II–5.0, III–57.7, IV–37.6, V–34.8, VI–19.6+22.3. Secondary rhinaria usually 4–8 in number. Rostrum short, reaching a little beyond fore coxae; ultimate segment about

0.7 times as long as 2nd segment of hind tarsus, with 6–8 setae, of which the longest one is 0.9–1.3 times as long as middle breadth of 3rd antennal segment; mandibular laminae with a seta. Hind tibiae with many pointed setae 1.0–1.5 times as long as its middle breadth, with 4 thick spines at apex. First segment of all tarsi with 9 setae. Abdomen with a double row of brown spinal tubercles, which are distinct and imbricated. Abdominal tubercles with a seta; 8th segment with 2–4 setae. Dorsal abdominal chaetotaxy essentially as in Fig. 2, A. Cornicle short, somewhat shorter than breadth,

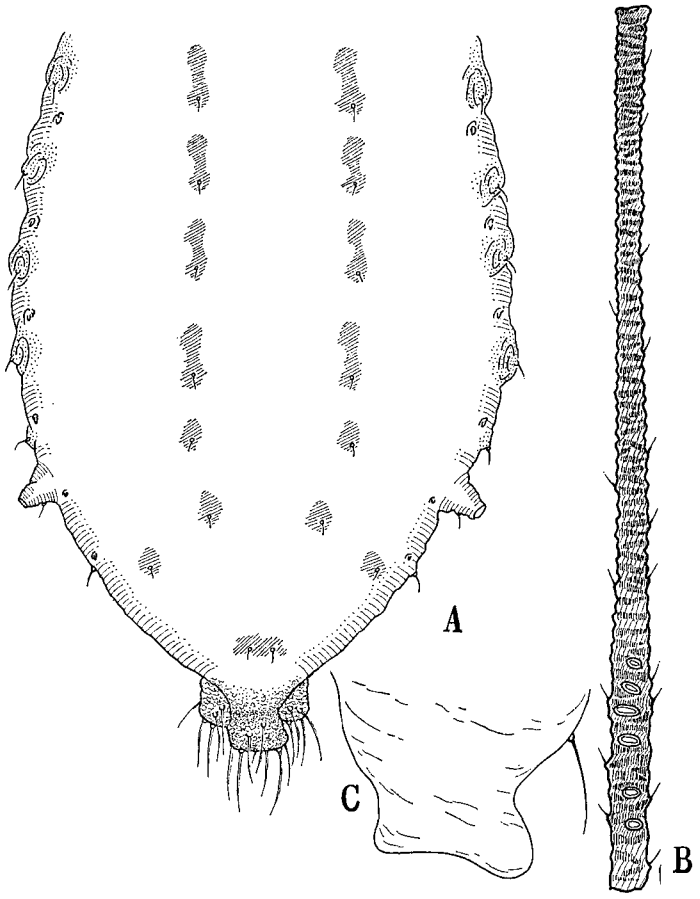

Fig. 2. *Takecallis arundinariae* (Essig), alate viviparous female.
A, abdomen; B, 3rd antennal segment; C, cornicle.

0.5–0.8 times as long as 1st antennal segment, with a seta. Cauda knobbed, with 12–15 setae, of which the longest one is 2.2–2.5 times as long as middle breadth of 3rd antennal segment. Anal plate bilobed. Genital plate with 18–24 setae 0.9–1.3 times as long as middle breadth of 3rd antennal segment.

Specimens examined: Many alatae taken from the following localities:—Japan: Honshu—Osaka, 3-iv-53, 13-iv-54, R. Takahashi leg. Europe: England—Kew, 25-vi-61, V. F. Eastop leg.

Host plants: Bamboo (in Japan); *Arundinaria graminea, A. japonica, Phyllostachys dulcis, P. castillonis* & *P. viridiglaucescens* (in England after Stroyan, 1964).

Distribution: Japan; Korea; Formosa; Europe; North America.

This species is unlikely to be confused with other related species in Japan, since it is readily distinguished from any others by the double row of brown spinal tubercles on the abdomen.

Takecallis sasae (Matsumura)

Myzocallis sasae Matsumura, Jour, Coll. Agr., Tohoku Imp. Univ. Sapporo 7(6): 372. 1917.

Myzocallis sasae: Takahashi, Proc. Ent. Soc. Wash. 28(7): 160, 1926; Shinji, Monog. Japan. Aphid.: 322, 1941.

Agrioaphis sasacola Shinji, Jour. Appl. Zool. 7: 285, 1935. **Syn. nov.**

Myzocallis sasacola: Shinji, Monog. Japan. Aphid.: 1150, 1941.

Takecallis sasae: Hille Ris Lambers, Tijdschr. Ent. 108: 202, 1965; Takahashi, Ins. Mats. 28(1): 58, 1965 (partim).

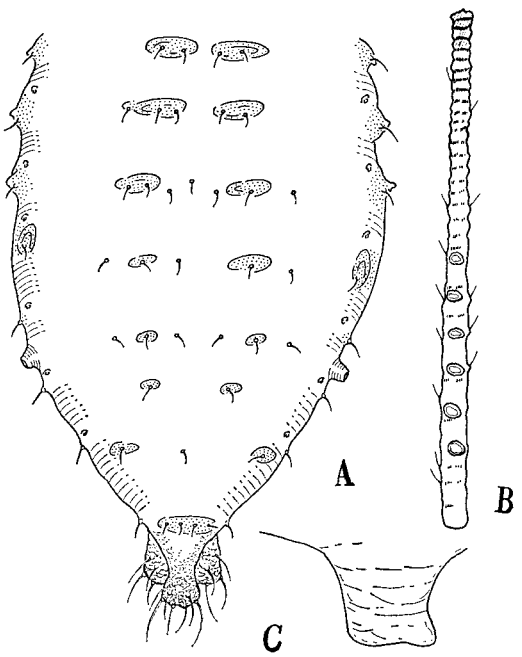

Fig. 3. *Takecallis sasae* (Matsumura), alate viviparous female.
A, abdomen; B, 3rd antennal segment; C, cornicle.

On the basis of the present specimens a redescription will be given below:—

Alate viviparous female. Body green. Eyes red. Antennae yellowish green; 3rd and 4th segments at apex, 5th and 6th segments wholly dusky. Legs with femora yellowish green; tibiae and tarsi yellowish brown. Abdominal tubercles colourless, but often somewhat dusky. Cornicle and cauda concolorous with body. Body oblong, about 1.8 mm. in length including cauda. Head smooth, without antennal tubercles, with 4 pairs of ventral pointed setae 1.1–1.5 times as long as middle breadth of 3rd

antennal segment. Antennae about 0.8 times as long as body including cauda; 1st and 2nd segments with 3 pointed setae 1.0–1.7 times as long as middle breadth of 3rd antennal segment; 3rd segment somewhat imbricated, with 12–16 short pointed setae 0.5–0.9 times as long as its middle breadth; 4th–6th segments imbricated. Relative length of antennal segments as follows: I–4.5, II–4.0, III–34.5, IV–16.5, V–15.5, VI–10.5+11.0. Secondary rhinaria usually 5–7 in number, arranged on basal half of 3rd antennal segment (Fig. 3, B). Rostrum short, reaching a little beyond fore coxae; ultimate segment about 0.6 times as long as 2nd segment of hind tarsus, with 8–9 setae, of which the longest one is 1.0–1.3 times as long as middle breadth of 3rd antennal segment; mandibular laminae with 2 setae. Hind tibiae with many pointed setae 0.7–1.0 times as long as its middle breadth, with 4 thick spines at apex. First segment of all tarsi with 5–7 setae. Abdomen with 1st–4th segments bearing distinct and imbricated tubercles; 5th and following segments with tubercles often small and inconspicuous. Dorsal abdominal chaetotaxy essentially as in Fig. 3, A. Spinal tubercles of 1st abdominal segment with 2 setae, those of 2nd–4th segments with 1 or 2 setae, those of remaining segments with 1 seta. Abdominal marginal tubercles with a seta. Venter of each abdominal segment with many pointed setae; 6th segment with 16–20 ventral setae 1.0–1.5 times as long as middle breadth of 3rd antennal segment. Cornicle short, somewhat shorter than breadth, 0.4–0.7 times as long as 1st antennal segment, without setae. Cauda knobbed, with 11–14 setae, of which the longest one is 2.8–4.0 times as long as middle breadth of 3rd antennal segment. Anal plate bilobed. Genital plate with 19–26 setae 1.0–2.0 times as long as middle breadth of 3rd antennal segment.

Specimens examined: Many alatae taken from the following localities:—Japan: Hokkaido—Sapporo, 23–ix–64, M. Miyazaki leg. Honshu—Sendai, Miyagi-ken, 27–vi–67, H. Higuchi leg.; Mt. Chokai, Yamagata-ken, 4–ix–66, K. Kusigemati leg.; Hirayu, Gifu-ken, 2–viii–59, R. Takahashi leg.; Tokyo, 25–viii–57, R. Takahashi leg.; Osaka, 9–vi–57, R. Takahashi leg.

Host plants: *Phyllostachys* sp., *Pleioblastus* sp., *Sasa nipponica* Makino et Shibata & *Sasa paniculata* Makino et Shibata.

Distribution: Japan (Hokkaido, Honshu).

In the course of the present study I have come to the conclusion that *Agrioaphis sasacola* Shinji, 1935, should be suppressed as a synonym of this species.

Takecallis taiwanus (Takahashi)

Myzocallis taiwanus Takahashi, Proc. Ent. Soc. Wash. 28(7): 160, 1926.
Therioaphis tectae Tissot, Florida Ent. 16: 11, 1932.
Myzocallis sasae: Takahashi, Dept. Agr. Govt. Res. Inst. Formosa, Rept. 16: 46, 1925 (partim).
Myzocallis arundinariae: Theobald, The plant-lice or Aphididae of Great Britain 2: 343, 1927.
Agrioaphis taiwanus: Takahashi, Dept. Agr. Govt. Res. Inst. Formosa, Rept. 53: 84, 1931.
Takecallis arundinariae: Cottier, Bull. N. Z. Dept. Scient. Ind. Res. 106: 87, 1953.
Takecallis sasae: Tao, Q. Jour. Taiwan Mus. 17: 220, 1964 (partim); Takahashi, Ins. Mats. 28(1): 58, 1965 (partim).
Takecallis taiwanus: Stroyan, Trans. R. ent. Soc. Lond. 116: 34, 1964; Hille Ris Lambers, Tijdschr. Ent. 108: 202, 1965; Eastop, Aust. Jour. Zool 14: 520, 1966.

On the basis of the present specimens a redescription will be given below:—

Alate viviparous female. Body oblong, about 1.9 mm. in length including cauda. Headsmooth, without antennal tubercles, with 4 pairs of ventral pointed setae 1.3–1.8

times as long as middle breadth of 3rd antennal segment. Antennae about 0.8 times as long as body including cauda; 1st and 2nd segments with 3 pointed setae 0.5–1.2 times as long as middle breadth of 3rd antennal segment; 3rd segment somewhat imbricated, with 8–13 short pointed setae about 0.5 times as long as middle breadth of the segment; 4th–6th segments imbricated. Relative length of antennal segments as follows: I–4.8, II–4.2, III–34.5, IV–19.8, V–18.3, VI–10.3+9.7. Secondary rhinaria usually 5 or 6, arranged on basal one-third of 3rd antennal segment (Fig. 4, B). Rostrum short, reaching a little beyond fore coxae; ultimate segment about 0.6 times as long as 2nd segment of hind tarsus, with 7–9 setae, of which the longest one is 0.9–1.0 times as long as middle breadth of 3rd antennal segment; mandibular laminae with 1 or 2 setae; clypeus with a pairs of anterior setae. Hind tibia with many pointed

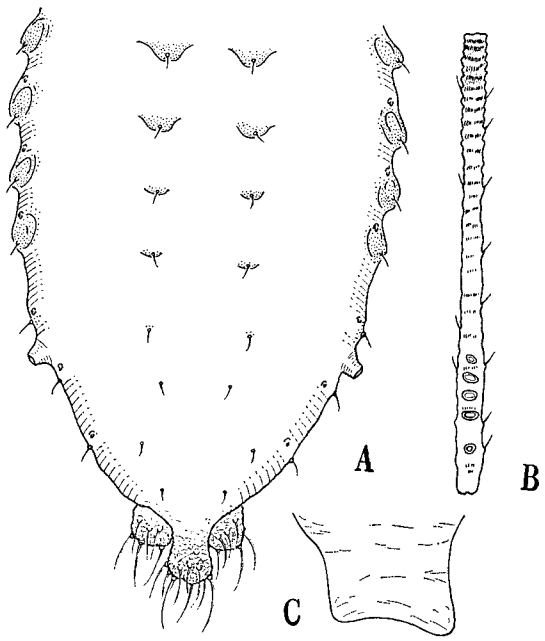

Fig. 4. *Takecallis taiwanus* (Takahashi), alate viviparous female.
A, abdomen; B, 3rd antennal segment; C, cornicle.

setae 1.0–1.3 times as long as its middle breadth, with 4 thick spines at apex. First segment of all tarsi with 5–7 setae. Abdomen with 1st–4th segments bearing imbricated tubercles which are especially large on 1st and 2nd; 5th and following segments with tubercles often small and inconspicuous. Dorsal abdominal chaetotaxy essentially as in Fig. 4, A. Abdominal tubercles with a seta. Venter of each abdominal segment with many pointed setae; 6th segment with 18–24 ventral setae 1.0–1.5 times as long as middle breadth of 3rd antennal segment. Cornicle short, somewhat shorter than breadth, 0.5–0.7 times as long as 1st antennal segment, without setae. Cauda knobbed, with 14–16 setae, of which the longest one is 3.2–3.6 times as long as middle breadth of 3rd antennal segment. Anal plate bilobed. Genital plate with 17–20 setae 1.0–2.0 times as long as middle breadth of 3rd antennal segment.

Specimens examined: Many alatae taken from the following localities:—Japan: Honshu—Osaka, 3-iv-54, 3-v-54, & 9-vi-59, R. Takahashi leg. Europe: England—Kew, 25-vi-61, V. F. Eastop leg.

Host plants: *Sasa* spp. (in Japan and Formosa); *Arundinaria anceps*, *A. gigantea*, *Phyllostachys dulcis*, *P. nigra* & *P. castukkinis* (in England after Stroyan, 1964).

Distribution: Japan; Formosa; New Zealand; Europe.

Previous authors have suppressed *taiwanus* as a synonym of *sasae*. This species is, however, readily distinguished from *sasae* by the distribution of the rhinaria on the 3rd antennal segment and by the presence of a seta on the 1st abdominal spinal tubercle as mentioned in the accompanying key.

Hille Ris Lambers (1965) stated that *Therioaphis tectae* Tissot, 1932, from Florida might be a synonym of this species. According to the literature the aphid stated by Theobald (1927) under the name *Myzocallis arundinariae* from England is, in reality, to be identified with this species.

Key to the species of the genus *Takecallis*

(Alate viviparous female)

1. Antennae longer than body. Cornicle with a seta. Secondary rhinaria arranged on black area of 3rd antennal segment. White or yellowish in life. 2
- Antennae shorter than body. Cornicle without setae. Secondary rhinaria arranged on pale or dusky area of 3rd antennal segment. Green in life. 3
2. Abdomen with 1st-4th segments bearing imbricated tubercles, and 5th and following segments small and inconspicuous tubercles. Cauda black. . . . . *arundicolens* (Clarke)
- Abdomen with a double row of brown spinal tubercles which are distinct and imbricated. Cauda pale or dusky. . . . . *arundinariae* (Essig)
3. Third antennal segment with rhinaria on basal half. First abdominal spinal tubercle with 2 setae. . . . . *sasae* (Matsumura)
- Third antennal segment with rhinaria on basal one-third. First abdominal spinal tubercle with 1 seta. . . . . *taiwanus* (Takahashi)

The following two bamboo aphids which were originally described as members of the genus *Myzocallis* Passerini by Takahashi from Formosa might be referred to the genus *Takecallis*. However, further taxonomic discussions of these species must await detailed examinations of their authentic materials.

Myzocallis bambusicola Takahashi

Myzocallis bambucicola Takahashi, (sic), Agr. Ext. Sta. Govt. Formosa, Extra Rept. 20: 70, 1921.

Myzocallis bambusicola: Takahashi, Dept. Agr. Govt, Res. Inst. Formosa, Rept. 4: 119, 1923; idem, Proc. Ent. Soc. Wash. 28(7): 162, 1926.

Agrioaphis bambusicola: Takahashi, Dept. Agr. Govt. Res. Inst. Formosa, Rept. 53: 85, 1931.

Host plants: *Bambusa stenostachya* & *Dendrocalamus latiflorus*.

Distribution: Formosa.

Myzocallis formosanus Takahashi

Myzocallis formosanus Takahashi, Dept. Agr. Govt. Res. Inst. Formosa, Rept. 10: 64, 1924.

Myzocallis formosanus: Takahashi, Proc. Ent. Soc. Wash. 28(7): 160, 1926.

Monellia formosana: Takahashi, Dept. Agr. Govt. Res Inst. Formosa, Rept. 53: 81, 1931.

Host plants: *Arundinaria* spp.

Distribution: Formosa.

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Takahashi, R. 1921 Aphididae of Formosa. Agr. Ext. Sta. Govt. Formosa, Extra Rept. 20: 1–97.

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———————— 1924 Aphididae of Formosa. Dept. Agr. Govt. Res. Inst. Formosa, Rept. 10: 1–121.

———————— 1925 Aphididae of Formosa. Dept. Agr. Govt. Res Inst. Formosa, Rept. 16: 1–65.

———————— 1926 The aphids of Myzocallis infesting bamboo. Proc. Ent. Soc. Wash. 28(7): 159–162.

———————— 1931 *Aphididae of Formosa*. Dept. Agr. Govt. Res. Inst. Formosa, Rept. 53: 1–127.

———————— 1965 Some new and little-known Aphididae from Japan (Homoptera). Ins. Mats. 28(1): 19–61.

Tao, C. C. 1964 Revision of Chinese Callipterinae (Aphidae, Homoptera). Q. Jour. Taiwan Mus. 17: 209–226.

Theobald, F. V. 1927 The plant-lice or Aphididae of Great Britain. London, 2: 1–411.