

REVIEW OF THE GENUS *TAKECALLIS* MATSUMURA  
(HOMOPTERA: APHIDIDAE: MYZOCALLIDINAE) FROM CHINA  
AND DESCRIPTION OF ONE NEW SPECIES

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**ABSTRACT.** – The aphid genus *Takecallis* is reported from China. Five species occur in China, *T. arundicolens* (Clarke), *T. arundinariae* (Essig), *T. assumentus*, new species, *T. taiwanus* (Takahashi), and *T. takahashii* (Hsu). A key to species from China, morphological descriptions, host plants, distribution and biology are provided. Type specimens are deposited in Zoological Museum, Institute of Zoology, Chinese Academy of Sciences, and the Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore.

**KEY WORDS.** – Homoptera, Aphididae, Myzocallidinae, *Takecallis*, new species, China.

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INTRODUCTION

Matsumura (1917) erected the genus *Takecallis* for *Callipterus arundicolens* Clarke. The genus *Takecallis* is placed in the subfamily Myzocallidinae, family Aphididae (Remaudière & Remaudière, 1997: 224). The genus is represented by seven species in the world, distributed mainly in the Holarctic, Oriental and Australian regions. These species are as follows: *T. affinis* Ghosh (India), *T. arundicolens* (Clarke) (China, Japan, Korea, Europe, North America), *T. arundinariae* (Essig) (China, India, Japan, Korea, Europe, North America), *T. assumentus*, new species (China), *T. sasae* (Matsumura) (Japan), *T. taiwanus* (Takahashi) (China, Japan, Europe, North America, New Zealand), and *T. takahashii* (Hsu) (China) (Remaudière & Remaudière, 1997; Ghosh, 1990; Tao, 1990; Higuchi, 1972; Stroyan, 1977; Paik, 1965). Five species occur in China.

MATERIALS AND METHODS

The terminology follows in that of Ghosh (1990). Measurements are in millimeters (mm). The specimens studied were collected by Ms. Li Jin-Hua, Dr. Qiao Ge-Xia, Mr. Tian Shi-Bo, Dr. Xu Hua-Chao, Mr. Yan Heng-Yuan, Mr. Yao Rui-Liang, Mr. Yu Zhi-Shou, Prof. Zhang Guang-Xue, Dr. Zhang Wan-Yu, and Mr. Zhong Tie-Sen.

Specimens have been deposited in Zoological Museum, Institute of Zoology, Chinese Academy of Sciences (ZMIOZ), and the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, National University of Singapore.

TAXONOMY

*Takecallis* Matsumura, 1917

*Takecallis* Matsumura, 1917: 373.

*Takecallis* Matsumura - Cottier, 1953: 87; Hille Ris Lambers, 1965: 202; Eastop, 1966: 519; Higuchi, 1968: 25; 1972: 35; Stroyan, 1977: 71; Ghosh, 1990: 229; Tao, 1990: 134.

Type species. – *Callipterus arundicolens* Clarke, 1903, by original designation.

**Diagnosis.** – All viviparae alatae. Head with poorly developed antennal tubercles; dorsum without any sutures; clypeus with an anteriorly directed nose-like projection with 2 hairs. Antenna 6-segmented, shorter or longer than body; processus terminalis sub-equal to the base of the segment. Rostrum hardly reaching beyond fore coxae, ultimate rostral segment very short, shorter than second hind tarsal segment, with or without accessory hairs. Abdominal tergites pale, with small wart-like paired spinal elevations, sometimes on scleroites; spinal and marginal hairs on abdominal tergites single, spinal hairs on tergite VII laterally displaced, tergite VIII with 2-5 dorsal hairs. All dorsal hairs of body short and acute. Siphunculi short, truncate, without distinct apical flange, with or without a hair appended to the base. Cauda knobbed, with 10-16 hairs. Anal plate bilobed. Rudimentary gonapophyses two. First tarsal segments each with 5 or 6 ventral hairs and 2 dorsal hairs. Empodial hairs flattened. Wax plates minute or absent. Fore wings with media twice-branched, hind wings with both obliques.

Embryos with long capitate dorsal hairs; spinal and marginal hairs single, pleural hairs absent. Siphunculi appear ring like.

**Biology.** – The members of this genus are pale yellow to pale green in life and infest leaves of bamboo (*Arundinaria*, *Phyllostachys*, *Pleioblastus*, *Sasaella*, *Sasa* spp.). Only alate viviparae are known, sexual forms not known. These species appear to lead anholocyclic life cycles throughout the year (Ghosh, 1990).

**Distribution.** – East Asia (China, Japan, Korea, India), Europe, North America, and New Zealand.

**Material examined.** – 2 alate viviparous females (No.5568), Zhejiang Province (Hangzhou City), 4 May.1975, on bamboo, coll. Tiesen Zhong.

**Host-plants.** – *Phyllostachys* sp., *Sasa nipponica* (Makino), *Sasa palmate* (Bean) and *Sasa senaensis* (Franch. and Sav.) (after Higuchi, 1972).

**Distribution.** – China: Zhejiang (Hangzhou), Taiwan; Japan, Korea, Europe, North America.

**Biology.** – Infesting underside bamboo leaves.

### Key to species of *Takecallis*

#### Alate viviparous female

1. Antennae longer than body; siphunculi with a hair at the base; secondary rhinaria arranged on black area of antennal segment III; white or yellow in life ..... 3
  - Antennae shorter than body; siphunculi without hairs; secondary rhinaria arranged on pale or dusky area of antennal segment III; green, brown and yellowish brown in life ..... 2
2. Anterior abdominal tergites with at least 4 dorsal hairs excluding marginal ones; secondary rhinaria arranged on basal 1/2 of antennal segment III ..... *T. sasae* (Matsumura)
  - Each abdominal tergite with 2 dorsal hairs excluding marginal ones; secondary rhinaria arranged on basal 1/3 of antennal segment III ..... *T. taiwanus* (Takahashi)
3. Cauda black. Abdominal tergites pale, without any patches ..... *T. arundicolens* (Clarke)
  - Cauda pale or dusky ..... 4
4. Thoracic dorsum pale, without any stripes .... *T. takahashii* (Hsu)
  - Thoracic dorsum with dark stripes, at least on pronotum ..... 5
5. Dark stripes only on pronotum ..... 6
  - Dark stripes on total thorax dorsum. Abdominal tergites I - VII with two rows of separated spinal and “8-shaped” black spots ..... *T. arundinariae* (Essig)
6. Abdominal tergites II(sometimes I)-VII each with 1 pair of round patches, tergite VIII with a spinal patch; ultimate rostral segment without accessory setae; distal half of hind tibia distinctly thickened, widest diameter 1.89 times as long as basal diameter of the segment, but 1.33 times in fore and middle tibia; fore wing with brown subcostal veins, other black markings absent ..... *T. assumentus*, new species
  - Abdominal tergites pale, without any patches; ultimate rostral segment with 2 pairs of accessory setae; hind tibia normal, similar to fore and middle tibia; fore wing with extensive black markings on costal veins and with spot on base of pterostigma ..... *T. affinis* Ghosh

#### *Takecallis arundicolens* (Clarke, 1903)

*Callipterus arundicolens* Clarke, 1903: 249.

*Takecallis bambusae* Matsumura, 1917: 351-414.

*Takecallis arundicolens* (Clarke) - Hille Ris Lambers, 1965: 202; Eastop, 1966: 520; Higuchi, 1968: 25; Higuchi, 1972: 35; Stroyan, 1977: 71; Paik, 1965: 49; Tao, 1963: 59; Tao, 1964: 220.

#### *Takecallis arundinariae* (Essig, 1917)

*Myzocallis arundinariae* Essig, 1917: 302.

*Myzocallis bambusifoliae* Takahashi, 1921: 73.

*Takecallis arundinariae* (Essig) - Hille Ris Lambers, 1965: 202; Eastop, 1966: 520; Higuchi, 1968: 27; Higuchi, 1972: 35; Stroyan, 1964: 34; Paik, 1965: 49; Tao, 1963: 59; Tao, 1964: 220; Tao, 1990: 134; Zhang & Zhong, 1983: 158.

**Material examined.** – 6 alate viviparous females (No.Y5839), Hebei Province (Yixian County), 15 May.1985, on *Phyllostachys puberula*, coll. Shibo Tian; 10 al. vivi. females (No.5804), Zhejiang Province (Hangzhou City), 24 May.1975, on *Bambusa stenostachy*, coll. Tiesen Zhong; 6 al. vivi. females and 7 nymphs (No.5520), Zhejiang Province (Hangzhou City), 29 Apr.1975, on *Bambusa* sp., coll. Tiesen Zhong; 6 al. vivi. females and 2 nymphs (No.5573), Zhejiang Province (Hangzhou City), 4 May.1975, on *Sinobambusa tootsik*, coll. Tiesen Zhong; 5 al. vivi. females (No.5659), Zhejiang Province (Hangzhou City), 9 May.1975, on *Bambusa stenostachy*, coll. Guangxue Zhang; 1 al. vivi. female (No.7515), Fujian Province (Wuyishan Mountain), 23 Apr.1982, on *Bambusa stenostachy*, coll. Tiesen Zhong; 2 al. vivi. females (No.6001), Shandong Province (Taishan Mountain), 12 Jun.1975, on *Bambusa stenostachy*, coll. Tiesen Zhong; 9 al. vivi. females and 6 nymphs (No.Y1083), Shandong Province (Qingdao City), 1975, on *Bambusa textilis*, coll. Zhishou Yu; 1 al. vivi. female (No.6777), Hubei Province (Enshi City), 23 Oct.1977, on *Bambusa rigida*, coll. Guangxue Zhang; 2 al. vivi. females (No.8943), Hunan Province (Dayong County), 12 Oct.1988, on *Phyllostachys edulis*, coll. Tiesen Zhong and Wanyu Zhang; 1 al. vivi. female (No.8938), Hunan Province (Dayong County), 11 Oct.1988, on *Bambusa stenostachy*, coll. Tiesen Zhong and Wanyu Zhang; 6 al. vivi. females (No.10695), Yunnan Province (Lijiang City), 13 Apr.1995, on *Bambusa* sp., coll. Gexia Qiao; 8 al. vivi. females (No.7151), Yunnan Province (Lijiang City), 24 May.1980, on *Bambusa stenostachy*, coll. Tiesen Zhong; 4 al. vivi. females and 2 nymphs (No.Y1736), Yunnan Province (Songming County), 3 Sep.1979, on *Bambusa* sp., coll. Tiesen Zhong; 1 al. vivi. female and 2 nymphs (No.7285), Yunnan Province (Kunming City), 12 Feb.1982, on *Bambusa* sp., coll. Guangxue Zhang; 8 al. vivi. females and 1 nymph (No.4050, No.4068), Yunnan Province (Kunming City), 18 Feb.1960, on *Bambusa* sp., coll. Guangxue Zhang; 2 al. vivi. females (No.8632), Gansu Province (Yuzhong County), 4 Sep.1986, on *Bambusa* sp., coll. Guangxue Zhang and Jinhua Li; 2 al. vivi. females (No.13365), Yunnan Province (Kunming City), 11 Oct.2002, on *Bambusa* sp., coll. Yihua Ren.

**Host-plants.** – Host plants in China include *Bambusa lapidea*, *B. rigid*, *B. stenostachya*, *B. textiles*, *Phyllostachys bambusoides*, *P. edulis*, *P. viridis*, *P. pubescens*, *Pleioblastus amarus*, *Sinobambusa tootsik* etc. In Japan, host plants are *Arundinaria* sp., *Phyllostachys* spp., *Sasa nipponica*, *S. palmate* and *S. senaensis* (after Higuchi, 1972).

**Distribution.** – China: Hebei (Yixian), Zhejiang (Hangzhou), Fujian (Wuyishan), Jiangxi (Xingzi), Shandong (Tai'an, Qingdao), Hubei (Enshi), Hunan (Dayong), Sichuan, Yunnan (Kunming, Songming, Lijiang), Gansu (Yuzhong), Taiwan; Japan, Korea, Europe, North America.

**Biology.** – The aphid infests the under sides of leaves of bamboo singly.

#### *Takecallis taiwanus* (Takahashi, 1926)

*Myzocallis taiwanus* Takahashi, 1926: 160.

*Therioaphis tectae* Tissot, 1932: 11.

*Takecallis taiwanus* (Takahashi) - Hille Ris Lambers, 1965: 202; Eastop, 1966: 520; Higuchi, 1968: 30; Higuchi, 1972: 36; Stroyan, 1964: 34; Tao, 1990: 134; Zhang, 1999: 233; Zhang & Zhong, 1983: 157.

**Material examined.** – 2 alate viviparous females (No.Y2058), Shanghai City, 6 Jun.1978, on *Bambusa* sp., coll. Ruiliang Yao; 4 al. vivi. females (No.402), Sichuan (Guanxian County), 27 Jul.1963, on bamboo, coll. Guangxue Zhang and Tiesen Zhong; 10 al. vivi. females (No.Y1666), Zhejiang Province (Hangzhou City), 29 May.1979, on *Phyllostachys arcana*, coll. Hengyuan Yan; 8 al. vivi. females (No.Y899), Zhejiang Province (Hangzhou City), 17 May.1965, on bamboo, coll. Guangxue Zhang and Tiesen Zhong; 7 al. vivi. females (No.13176, No.13177, No.13178), Zhejiang Province (Hangzhou City), 12 May 2000, on *Bambusa* sp., coll. Huachao Xu; 12 al. vivi. females (No.5485), Zhejiang Province (Hangzhou City), 26 Apr.1975, on *Bambusa* sp., coll. Guangxue Zhang; 8 al. vivi. females (No.5521, No.5522, No.5523), Zhejiang Province (Hangzhou City), 29 Apr.1975, on *Bambusa* sp., coll. Tiesen Zhong; 6 al. vivi. females (No.5568), Zhejiang Province (Hangzhou City), 4 May.1975, on *Phyllostachys bambusoides*, coll. Tiesen Zhong; 5 al. vivi. females (No.5569), Zhejiang Province (Hangzhou City), 4 May.1975, on *Bambusa* sp., coll. Tiesen Zhong; 4 al. vivi. females (No.5570), Zhejiang Province (Hangzhou City), 4 May.1975, on *Pleioblastus amarus*, coll. Tiesen Zhong; 3 al. vivi. females (No.5578), Zhejiang Province (Hangzhou City), 4 May.1975, on *Phyllostachys bambusoides*, coll. Guangxue Zhang; 7 al. vivi. females (No.5659), Zhejiang Province (Hangzhou City), 9 May.1975, on *Bambusa stenostach*, ZTs; 5 al. vivi. females, No.6001, Shandong (Taishan Mountain), 12 Jun.1975, on *Bambusa stenostach*, coll. Tiesen Zhong; 10 al. vivi. females (No.10698), Yunnan Province (Lijiang City), 13 Apr.1995, on *Bambusa* sp., coll. Gexia Qiao; 4 al. vivi. females (No.13355), Yunnan Province (Kunming City), 22 Aug.2002, on *Phyllostachys sulphurea*, coll. Xiaohong Ou.

**Host-plants.** – In China, host plants include *Bambusa stenostach*, *Phyllostachys arcana*, *P. bambusoides*, *P. sulphurea*, and *Pleioblastus amarus*.

**Distribution.** – China: Zhejiang (Hangzhou), Shandong (Taishan), Yunnan (Kunming, Lijiang), Shaanxi (Xi'an), Shanghai, Jiangsu, Sichuan, Taiwan; Japan, Europe, New Zealand, North America.

**Biology.** – The species is an important common pest on bamboo; it mainly infests young plants of bamboo. Generally, the aphid feeds on young leaves not fully developed, and forms numerous colonies.

#### *Takecallis takahashii* Hsu ex Tao, (1990) 1991

*Takecallis takahashii* Hsu, 1980: 43 (Doctor thesis).

*Takecallis takahashii* Hsu ex Tao, 1990: 136.

**Material examined.** – No specimens have been seen. All information is from Tao (1990:136).

**Distribution.** – China: Taiwan.

**Biology.** – The host plant of the species is *Pseudosasa taiwanensis*.

#### *Takecallis assumentus*, new species

(Figs. 1-7, Table 1)

**Material material.** – Holotype - alate viviparous female (No. 11388-1-1), Huzhu County (36.3° N, 95.8° E), Qinghai Province, China, alt. 200 m, 8 Jun.1997, coll. Xialin Chen, on *Bambusa* sp.; deposited in Zoological Museum, Institute of Zoology, Chinese Academy of Sciences (ZMIOZ).

Paratypes – 3 alate viviparous females (No.11388-1-2, 11388-1-3) with all information as holotype (ZMIOZ); No.11388-1-4, 2 al. vivi. females, data as holotype (ZRC).

**Description.** – Alate viviparous female – Body elliptical, yellow; antennae grayish blue in life. Cleared specimens: dorsum of body pale, with sclerotized patches and bands.

Head: Medial front slightly developed, antennal tubercles developed, slightly higher than medial front. Dorsum of head pale. Dorsal setae of body fine and pointed. Head with 1 pair of cephalic setae, 1 pair of antennal tubercular setae, 1 pair of anterior dorsal setae and 2 pairs of posterior dorsal setae. Length of cephalic setae 0.036, 0.74 times as long as widest diameter of antennal segment III. Antennae 6-segmented, segments III - IV slender and with imbrications, except outer half of segments I - II pale, other parts of segments I - II slightly brown, base of segment III pale, other part of segment III dark brown, segments IV - V dark brown, base of segment VI slightly brown, processus terminalis pale; 1.56 times as long as body; length in proportion of segments I - VI: 9 : 7 : 100 : 60 : 52 : 31 + 34. Antennal setae fine and pointed, segments I - VI each with 4 or 5, 2 or 3, 30-43, 10-12, 5-8, 2+0, respectively, apex of processus terminalis with 4 setae; setae on segment III in length 0.42 times as long as widest diameter of the segment. Antennal segment III with 6-10 elliptical and ciliated secondary rhinaria, on basal 1/3 of the segment. Rostrum reaching fore coxae, ultimate rostral segment thick wedge-shaped, shorter and stout; length 0.67 times as long as its basal width, 0.43 times as long as second hind tarsal segment, with 3 pairs of setae, accessory setae absent.

Thorax: Marginal areas of pronotum with 1 pair of dark brown fine longitudinal stripes. Pronotum with 2 pairs of spinal and 1 pair of post-marginal setae. Fore wing media veins twice-branched, subcostal veins brown, other veins and pterostigma

slightly brown, other markings absent. Second tarsal segments brown and with transverse imbrications, other legs pale. Apex of tibia with 3 peg-like setae; basal 1/3 of tibia with sparsely transverse spinulose stripes. Fore coxae enlarged, distinctly larger than mid- and hind coxae. Hind femur 0.57 times as long as antennal segment III. Distal half of hind tibia distinctly thickened, widest diameter 1.89 times as long as basal diameter of the segment, but 1.33 times in fore and middle tibiae. Hind tibia 0.54 times as long as body. Setae on legs pointed, longer than dorsal setae of body; length of setae on hind tibiae 1.38 times as long as middle diameter of the segment. First tarsal segments each with 5 ventral setae and 2 dorsal setae.

Abdomen: Dorsum of abdomen pale, abdominal tergites I - VII each with 1 pair of spinal tubercles, each with 1 sub-apical seta; and with brown sub-circular spino-pleural patches on spinal tubercles, sometimes spinal tubercles on tergite I pale; tergite VIII with 1 spinal tubercle and 1 dorsal patch, spinal tubercle with 2 setae. Spinal tubercles and spinal patches on abdominal tergites III and VII distinctly displaced laterally. Abdominal tergites I - IV each with 1 pair of marginal tubercles, each with 1 seta and 1 small circular transparent sub-apical tubercle. Abdominal tergites I - VII each with 1 pair of spinal and 1 pair of marginal setae; tergite VIII with 2 spinal setae, all dorsal setae on dorsal tubercles.

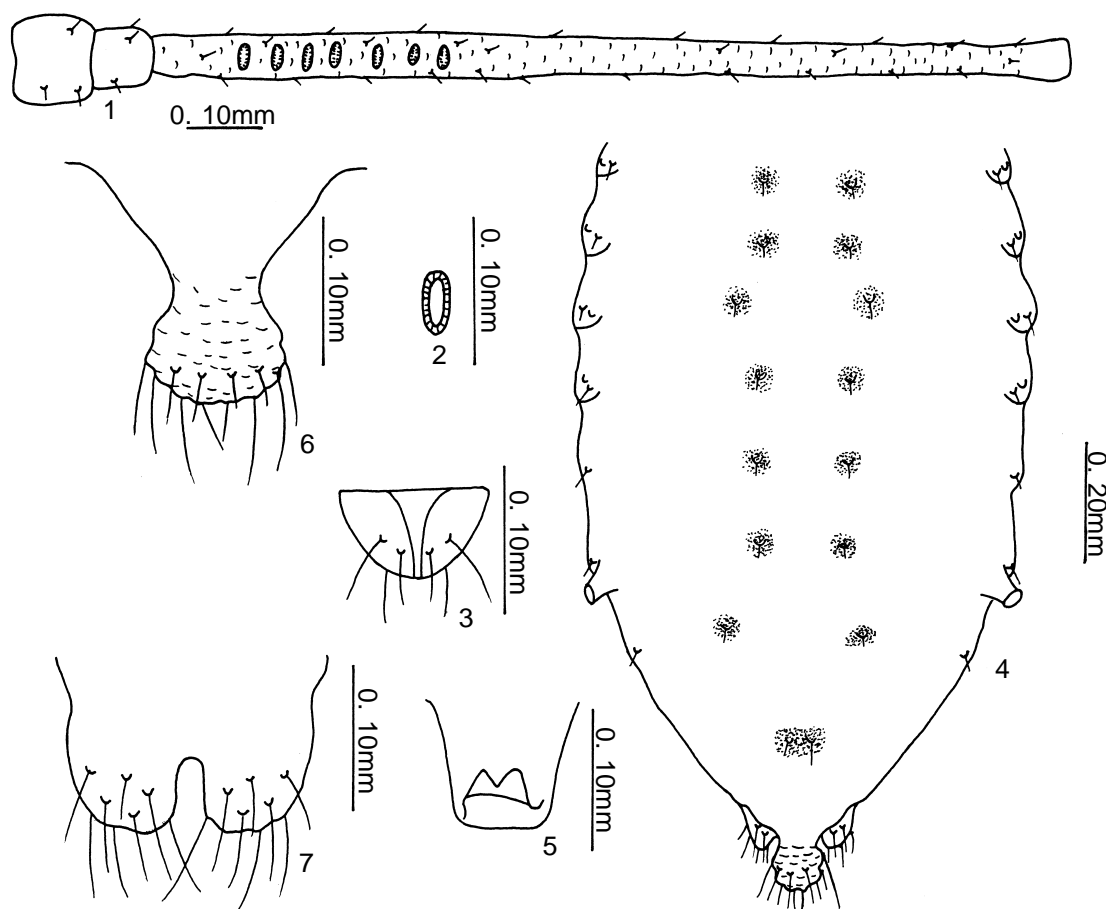
Length of marginal setae on tergite I 0.024, dorsal setae on tergite VIII 0.041, 0.49 times and 0.84 times, as long as widest diameter of antennal segment III respectively. Siphunculi brown at distal part, otherwise pale, truncate, length 0.81 times as long as its basal width, 0.46 times as long as cauda. Cauda and anal plate pale. Cauda knob-shaped, 0.79 times as long as basal width, with 12-14 setae. Anal plate bi-lobed, with 14-18 setae. Genital plate transversely oval, with 2 anterior setae, and 9 or 10 posterior setae.

**Etymology.** – “*Assumentus*” (Latin) is “patch”. This species is named for its dorsal patches on abdomen.

**Distribution.** – China (Qinghai).

**Biology.** – This species is associated with the plants of genus *Bambusa*, and infest the upper sides of the leaves. These aphids cause yellowing in the leaves.

**Remarks.** – This new species closely resemble *T. affinis* Ghosh by the color of antennal segments III - VI and longitudinal dark stripe on thoracic dorsum, but differs from it as shown in the key. The species is near *T. arundinariae* (Essig) and *T. takahashii* Hsu, but differs from *T. arundinariae* (Essig) in: dark stripes only on each side of pronotum (*arundinariae*: on total thoracic dorsum),



Figs.1-7. *Takecallis assumentus*, new species. Alate viviparous females: 1. antennal segments I - III 2. secondary rhinarium 3. ultimate rostral segment 4. dorsal view of abdomen 5. siphunculus 6. cauda; 7 genital plate. Scale bar: figs.1-3, 5-7=0.1 mm; fig.4= 0.2 mm.

Table 1. Measurements of alate viviparous females of *Takecallis assumentus* (mm) URS—ultimate rostral segment, Ant. III, IV, V, VI—antennal segments III, IV, V, VI

No.	Body length	Body width	Hind femur	Hind tibia	2 <sup>nd</sup> hind tarsus	URS	Ant. III	Ant. IV	Ant. V	Ant. VI	Siph unculti	Cauda
1	2.225	0.800	0.711	1.257	0.134	0.062	1.236	0.762	0.731	0.391+0.433	0.072	0.134
2	2.525	0.925	0.670	1.205	0.134	0.062	1.123	0.680	0.546	0.350+0.385	0.072	0.155
3	2.300	0.775	0.711	1.267	0.134	0.062	1.339	0.752	0.700	0.422+0.465	0.072	0.165
4	1.969	0.825	0.721	1.277	0.134	0.062	1.246	0.731	0.608	0.401+0.442	0.072	0.155
5	2.450	0.900	0.711	1.236	0.124	0.062	1.257	0.773	0.680	?	0.072	0.165
6	2.375	0.775	0.752	1.349	0.144	0.062	1.298	0.793	0.618	?	0.067	0.155
Average	2.352	0.833	0.712	1.265	0.134	0.062	1.250	0.748	0.654	0.391+0.430	0.071	0.155

abdominal tergites II (sometimes I) - VII with two rows of separated spinal and circular black spots (*arundinariae*: with two rows of separated spinal and “8-shaped” black spots), cauda and anal plate pale (*arundinariae*: dusky); differs from *T. takahashii* Hsu in: pronotum with dark stripe on each side (*takahashii*: without any dark stripes on thorax dorsum); antennal segment III dark brown except base of the segment (*takahashii*: middle part of antennal segment III pale); spinal tubercles on abdominal tergite VII dark brown (*takahashii*: pale); spinal tubercles and spinal patches on tergites III and VII distinctly displaced (*takahashii*: distinctly displaced on tergite V).

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Qiao & Zhang.: Review of the genus *Takecallis* from China

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