A new species of *Chucallis* Tao (Hemiptera, Aphididae, Calaphidinae) from China

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Academic editor: R. Blackman | Received 9 September 2011 | Accepted 4 November 2011 | Published 9 November 2011

Citation: Jiang LY, Chen J, Qiao GX (2011) A new species of *Chucallis* Tao (Hemiptera, Aphididae, Calaphidinae) from China. ZooKeys 146: 69–81. doi: 10.3897/zookeys.146.2042

Abstract

A new species in the aphid genus *Chucallis* Tao, *Chucallis latusigladius* Qiao, Jiang & Chen, sp. n. feeding on a species of bamboo, *Indocalamus tessellatus* (Munro) Keng f., is described. It differs from the only other known species in the genus by having remarkably large marginal processes on abdominal tergite IV. A key to species, morphological descriptions, distributional data and host plant information are provided. The type specimens studied are deposited in the National Zoological Museum of China, Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

Keywords

*Chucallis*, Aphididae, Calaphidinae, new species, China

Introduction

The aphid genus *Chucallis* was erected by Tao (1964), based on *Myzocallis bambusicola* Takahashi, 1921 as the type species. The genus can be easily separated from related genera by having long, finger-like dorsal processes on the abdomen, especially marginal ones. Until now, only one species is known (Remaudière and Remaudière 1997). After...
identifying the specimens and checking the specimens of the type species, *Chucallis latusigladius* Qiao, Jiang & Chen, sp. n., which is described in this paper. It is different from the only other known species in the genus in having remarkably large marginal processes on abdominal tergite IV. It feeds on one species of bamboo, *Indocalamus tessellatus* (Munro) Keng f., and occurs in Zhejiang and Fujian, China.

**Materials and methods**

Aphid terminology generally follows Quednau (2003) and Qiao et al. (2005). The unit of measurements is millimeters (mm). Metrical data were listed in Table 1.

**Table 1.** Metrical data of *Chucallis latusigladius* Qiao, Jiang & Chen, sp. n.

| Parts* | Alate viviparae (n=13) |
|--------|------------------------|
| | Mean | Range | Standard Deviation |
| Body length | 2.112 | 1.670–2.266 | 0.122 |
| Body width | 0.855 | 0.691–0.96 | 0.048 |
| Whole Antennae | 1.805 | 1.670–1.901 | 0.056 |
| Ant.I | 0.076 | 0.067–0.086 | 0.003 |
| Ant.II | 0.058 | 0.058 | 0 |
| Ant.III | 0.575 | 0.461–0.614 | 0.035 |
| Ant.IV | 0.333 | 0.288–0.365 | 0.021 |
| Ant.V | 0.335 | 0.317–0.374 | 0.014 |
| Ant.Vlb | 0.178 | 0.173–0.182 | 0.005 |
| PT | 0.224 | 0.211–0.259 | 0.010 |
| URS | 0.08 | 0.077–0.096 | 0.004 |
| Hind femur | 0.588 | 0.48–0.643 | 0.029 |
| Hind tibia | 1.113 | 0.974–1.210 | 0.045 |
| 2HT | 0.095 | 0.086–0.106 | 0.005 |
| SIPH | 0.160 | 0.134–0.202 | 0.017 |
| SIPH BW | 0.193 | 0.154–0.230 | 0.021 |
| SIPH DW | 0.073 | 0.067–0.077 | 0.004 |
| Cauda | 0.135 | 0.115–0.144 | 0.005 |
| BW Cauda | 0.162 | 0.154–0.192 | 0.010 |
| Ant.IIIBW | 0.019 | 0.019 | 0 |
| MW Hind tibia | 0.032 | 0.024–0.038 | 0.004 |
| MT on Tergum IV | 0.68 | 0.547–0.749 | 0.041 |
| BW of MT on Tergum IV | 0.166 | 0.144–0.192 | 0.016 |
| SW of MT on Tergum IV | 0.126 | 0.096–0.154 | 0.017 |
| DW of MT on Tergum IV | 0.050 | 0.038–0.077 | 0.013 |
| Cephalic setae | 0.042 | 0.038–0.058 | 0.007 |
| Setae on Tergum I | 0.041 | 0.029–0.058 | 0.007 |
| Setae on Tergum VIII | 0.039 | 0.029–0.058 | 0.007 |
| Setae on ANT.III | 0.014 | 0.014 | 0 |
| Setae on SIPH | 0.092 | 0.067–0.115 | 0.010 |
| Setae on MT of Tergum IV | 0.030 | 0.019–0.029 | 0.005 |
| Setae on Hind tibia | 0.046 | 0.038–0.058 | 0.005 |
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**Taxonomy**

*Chucallis* Tao

http://species-id.net/wiki/Chucallis

*Chucallis* Tao, 1964: 221. Type species: *Myzocallis bambusicola* Takahashi, 1921; by monotypy.

*Chucallis* Tao: Tao 1990: 139; Zhang 1999: 227–228; Qiao et al. 2005: 184.

**Generic diagnosis.** In alate viviparae, frontal tubercle not developed. Head without epicranial suture, clypeus without any processes. Antennae 6-segmented, processus terminalis slightly longer than base of the segment. Head and thorax without any dorsal processes. Abdominal tergites with dorsal spinal processes and developed marginal processes. Dorsal setae of body long and pointed, thick or fine. Rostrum short and stout.

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**Parts**

| Parts*                          | Alate viviparae (n=13) |
|--------------------------------|------------------------|
|                                | Mean  | Range       | Standard Deviation |
| Whole Antennae / Body          | 0.83  | 0.79–0.88   | 0.025              |
| Hind femur / Ant.III          | 1.03  | 0.98–1.09   | 0.029              |
| Hind tibia / Body             | 0.54  | 0.50–0.59   | 0.020              |
| PT / Ant.V1b                  | 1.26  | 1.16–1.33   | 0.051              |
| URS / BW URS                  | 1.04  | 0.89–1.14   | 0.069              |
| URS / 2HT                      | 0.86  | 0.72–1.11   | 0.075              |
| Cauda / BW Cauda              | 0.83  | 0.70–0.94   | 0.070              |
| Cephalic setae / Ant.IIIBW     | 2.13  | 1.50–3.00   | 0.324              |
| Setae on Tergum I / Ant.IIIBW | 2.13  | 1.50–3.00   | 0.378              |
| Setae on Tergum VIII / Ant.IIIBW | 2.08  | 1.50–3.00   | 0.352              |
| Setae on ANT.III / ANT.IIIBW  | 0.75  | 0.75        | 0                  |
| Setae on hind tibia / MW Hind tibia | 1.46  | 1.25–1.67   | 0.146              |
| SIPH / Cauda                  | 1.20  | 1.00–1.43   | 0.139              |
| SIPH / SIPH BW                | 0.83  | 0.68–1.11   | 0.091              |
| SIPH / SIPH DW                | 2.09  | 1.67–2.86   | 0.274              |
| MT on Tergum IV / Ant.V       | 2.06  | 1.69–2.19   | 0.130              |
| Setae on SIPH / SIPH DW       | 1.26  | 0.88–1.50   | 0.112              |
| Setae on MT of Tergum IV / Ant.IIIBW | 1.54  | 1.00–2.00   | 0.261              |

* Abbreviations. Ant. I, II, III, IV, V, VIb, antennal segments I, II, III, IV, V and the base of antennal segment VI, respectively; PT, processus terminalis; Ant.IIIBW, the basal width of antennal segment III; URS, ultimate rostral segment; BW URS, basal width of ultimate rostral segment; 2HT, second hind tarsal segment; MW hind tibia, mid-width of hind tibia; SIPH, siphunculi; SIPH BW, basal width of siphunculi; SIPH DW, distal width of siphunculi; MT on Tergum IV, marginal tubercle on abdominal tergite IV; BW of MT on Tergum IV, basal width of marginal tubercle on abdominal tergite IV; SW of MT on Tergum IV, width of marginal tubercle on abdominal tergite IV where seta distributing; DW of MT on Tergum IV, distal width of marginal tubercle on abdominal tergite IV; BW Cauda, basal width of cauda.
Wing veins without black borders. Fore coxae distinctly expanded, mid- and hind coxae normal. First tarsal chaetotaxy: 5, 5, 5. Siphunculi truncated, slightly longer than their basal diameters. Cauda knob-shaped. Anal plate bilobed. Gonapophyses fused.

In embryos, dorsal setae of body thick and long, pointed or stout. Dorsum of head with 2 pairs of anterior and 2 pairs of posterior setae. Thoracic tergites each with 1 pair of spinal and 1 pair of marginal setae, respectively. Abdominal tergites I–VII each with 1 pair of spinal and 1 pair of marginal setae, respectively, and spinal setae on tergites III, V and VII slightly displaced pleurally; tergite VIII with 2 dorsal setae. Siphunculi visible.

**Distribution.** Only found in China (Zhejiang, Fujian, Sichuan, Gansu, Taiwan and Hong Kong).

**Host plants.** Plants of Gramineae/Poaceae, feeding on bamboos, such as *Bambusa stenostachya* Hack., *Dendrocalamus latiflorus* Munro, *Phyllostachys heteroclada* Oliv., *Thamnocalamus spathacaeus* (Franch.) Soderstr. and *Indocalamus tessellatus*.

**Biology.** The species colonize the undersides of the leaves of their host plants.

**Comments.** The genus is similar to *Subtakecallis* Raychaudhuri & Pal and *Takecallis* Matsumura (Quednau 2003), but the alatae differ from those genera in having the clypeus without a nose-like processus (*Subtakecallis* and *Takecallis*: the clypeus with a nose-like processus), and some abdominal tergites with long, finger-like, seta-bearing spinal and marginal processes, the marginal ones on tergite IV being especially large (*Subtakecallis* and *Takecallis*: some abdominal tergites with small processes, not longer than their basal width).

**Key to species of *Chucallis* (Alate viviparous females)**

1. Body dark purple to black in life; marginal processes on abdominal tergite IV about 0.60 times as long as antennal segment V; abdominal tergite VIII with 4 setae; siphunculi shorter, about 0.7 times as long as cauda .........................
   ........................................................................................................................................... C. bambusicola (Takahashi)
   – Head and thorax pale brown, abdomen dark green in life; marginal processes on abdominal tergite IV 1.69–2.19 times as long as antennal segment V; abdominal tergite VIII with 5 or 6 setae, occasionally 7 or 8 ones; siphunculi longer, 1.00–1.43 times as long as cauda .......................................................
   ........................................................................................................................................... C. latusigladius Qiao, Jiang & Chen, sp. n.

**Chucallis bambusicola** (Takahashi)
http://species-id.net/wiki/Chucallis_bambusicola

*Myzocallis bambusicola* Takahashi 1921: 70
*Agrioaphis bambusicola* Takahashi 1931: 85; Tseng and Tao 1938: 209.
*Chucallis bambusicola* (Takahashi): Tao 1964: 62; Tao 1990: 139; Zhang 1999: 228; Qiao et al. 2005: 184–186.
Specimens examined. 2 alate viviparous females, 4 May 1975, Zhejiang (Hangzhou City), No. 5567, on Phyllostachys heteroclada, coll. T.S. Zhong; 1 alate viviparous female, 7 August 1987, Gansu (Chongxin County), No. 8858, on a kind of bamboo, coll. T.S. Zhong; 2 alate viviparous females and 2 nymphs, 25 July 1986, Gansu (Longxi County), No. 8507, on a kind of bamboo, coll. G.X. Zhang, T.S. Zhong & J.H. Li; 4 alate viviparous females and 6 nymphs, 22 July 1985, Gansu (Tianshui City, Maijishan Mountain), No. 8092, on a kind of bamboo, coll. G.X. Zhang & T.S. Zhong; 2 alate viviparous females and 2 nymphs, 1 August 1987, Gansu (Gangu County), No. 8819, on Thamnocalamus spatheceusa, coll. T.S. Zhong.

Distribute. CHINA: Zhejiang (Hangzhou), Gansu (Chongxin, Longxi, Tianshui, Gangu), Sichuan (Chengdu), Taiwan and Hong Kong (Tao 1990).

Biology. On shoots and undersides of leaves of bamboos (Bambusa stenostachya, Dendrocalamus latiflorus, Phyllostachys heteroclada, Thamnocalamus spatheceusa). The species is very active, jumping when disturbed. Anholocyclic in Taiwan (Takahashi 1921), and sexual morphs are unrecorded (Blackman and Eastop 1994).

Chucallis latusigladius Qiao, Jiang & Chen, sp. n.
urn:lsid:zoobank.org:act:2A359DA9-53F8-4D15-8348-41588AC1AF9D
http://species-id.net/wiki/Chucallis_latusigladius
Figures 1–42

Locus typicus. China (Zhejiang, 28.39533°N, 118.84490°E, altitude 450m).

Etymology. The species is named for the very large, broadsword-shaped marginal processes on abdominal tergite IV. The specific name combines “latus (Latin, =broad, wide)” and “gladius (Latin, =sword)”.

Descriptions. Alate viviparous female. Body oval (Fig. 19), head and thorax pale brown, abdomen dark green in life (Figs. 36–38).

Mounted specimens. Head and thorax pale brown, dorsal spinal processes, marginal processes and seta-bearing processes brown; antennal segment I pale brown, antennal segments II–VI unpigmented; apex of rostrum brown; femora, tibiae and tarsi pale brown; siphunculi, cauda, anal plate and genital plate pale brown; wing veins pale and unbordered, basal and inner margins of pterostigma with dark fuscous forming a conspicuous crescent-shaped mark (Fig. 19); the other parts of specimens pale. Posterior margin of pronotum with short wrinkles; distal 1/3 of antennal segment III and segments IV–VI with sparse imbrications, middle of inner margin of segment I slightly swollen (Figs. 2, 21); distal 1/4 of tibiae with spinules, tarsi with spinulose short imbrications; dorsal spinal and marginal processes with sparse spinules or spinulose short stripes; cauda, anal plate and genital plate with sparse spinulose short stripes. Dorsal setae of body thick and pointed, long or short. Head with 1 pair of cephalic setae, 2 pairs of antennal tubercular setae and 2 pairs of posterior dorsal setae between eyes (Fig. 1); pronotum with 2 pairs of spinal and 1 pair of posterior marginal setae; abdominal tergite I with 1 pair of spinal and 1
pair of marginal setae, each on dorsal processes; tergite VIII with 5 or 6 setae, occasionally 7 or 8, 1 pair of them on dorsal spinal processes. Length of cephalic setae, marginal setae on abdominal tergite I and dorsal setae on tergite VIII 0.038–0.058, 0.029–0.058 and 0.029–0.058, respectively, all 1.50–3.00 times as long as basal width of antennal segment III.

**Head.** Median front and antennal tubercles un-developed, frontal profile shallow “W”-shaped (Figs. 1, 20). Dorsum of head without any processes. Antennae fine and long (Figs. 2–4, 21, 22), 6-segmented, 0.79–0.88 times as long as body; length in pro-

**Figures 1–18.** *Chucallis latusigladius* Qiao, Jiang & Chen, sp. n. Alate viviparous female: 1 dorsal view of head 2 antennal segments I–III 3 antennal segment IV 4 antennal segments V–VI 5 ultimate rostral segment 6 dorsal view of abdomen, showing processes 7 marginal tubercle on abdominal tergite I 8 spinal tubercle on abdominal tergite I 9 spinal tubercle on abdominal tergite II 10 spinal tubercle on abdominal tergite III 11 fore wing 12 siphunculus 13 cauda, 14 anal plate, 15 genital plate 16 gonapophyses. Embryo: 17 dorsal seta of body 18 setal pattern. Scale bars = 0.10 mm.
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Portion of segments I–VI: 12 : 9 : 100 : 60 : 60 : 36+47, respectively; processus terminalis 1.16–1.33 times as long as base of the segment. Secondary rhinaria round, with sparse and short ciliated, 4–7 ones distributing on basal 1/3–2/5 of antennal segment III. Antennal setae short and pointed, segments I–VI each with 2 or 3, 2 (occasionally 1), 5–7 (occasionally 3 or 4), 1–3, 1 (occasionally 2), 1+0 setae, respectively; apex of processus terminalis with 4 or 5 short pointed setae; setae of segment V distributing on basal 1/3 of the segment; length of setae on antennal segment III 0.75 times as long as basal width of the segment. Rostrum thick and short, apex reaching anterior margin of mesosternum; ultimate rostral segment stout, wedge-shaped (Figs. 5, 23), 0.89–1.14 times as long as its basal width, 0.72–1.11 times as long as second hind tarsal segment, with 3 pairs of primary and 3 pairs of accessory setae.

Thorax. Dorsum of thorax without any processes. Legs slender. Fore coxae distinctly expanded, mid- and hind coxae normal. Hind femur 0.98–1.09 times as long as antennal segment III, hind tibia 0.50–0.59 times as long as body. Setae on legs short, stiff and pointed, apex of tibiae with 3 peg-shaped setae (Fig. 26), distinct differ from other setae. Length of setae on hind tibia 1.25–1.67 times as long as mid-width of the segment. First tarsal chaetotaxy: 5, 5, 5. Wing veins pale without bordered; forewing with radial sector absent or with basal half indistinct; basal and

Figures 19–30. Chucallis latusigladius Qiao, Jiang & Chen, sp. n. Alate viviparous female: 19 dorsal view of body 20 dorsal view of head 21 antennal segments I–III 22 antennal segments IV–VI 23 ultimate rostral segment 24 dorsal view of abdomen 25 marginal tubercle and seta on abdominal tergite I 26 hind tarsal segments 27 siphunculus 28 cauda 29 anal plate 30 genital plate. Scale bars = 0.10 mm.
inner margins of pterostigma thickly marked with brown fuscous (Figs. 11, 19); hind wings with two oblique veins.

**Abdomen.** Abdominal tergites with developed spinal and marginal processes (Figs. 6, 24). Tergite I: 1 pair of conical spinal processes (Fig. 8), 0.03–0.08 long, 0.57–1.38 times as long as its basal width, 0.75–2.75 times as long as its distal width; apex of each tubercle with 1 thick, long and pointed seta, 0.06–0.14 long, 1.17–2.14 times as long as length of spinal processes; marginal processes not well developed (Figs. 7, 25), 0.019–0.029 long, 0.50 times as long as their basal widths. Tergite II: 1 pair of long conical spinal processes (Fig. 9), 0.096–0.173 long, 0.73–1.64 times as long as their basal widths, 2.50–4.50 times as long as their distal widths; a spinal seta on apex of each spinal tubercle, 0.067–0.086 long, 0.60–0.67 times as long as length of spinal processes; marginal processes conical, 0.029–0.048 long, 0.25–0.50 times as long as their basal widths; marginal setae as long as marginal processes. Tergite III: 1 pair of spinal processes (Fig. 10), which are close to each other at base, 0.019–0.048 long, 0.75–0.80 times as long as their basal widths;
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Embryo (in alate viviparous female). Dorsal setae of body thick, long and capitate at apex, with distinct basal processes (Fig. 17). Setal pattern (Fig. 18): dorsum of head with 2 pairs of anterior and 2 pairs of posterior setae; pro-, meso- and metanotum each with 1 pair of spinal and 1 pair of marginal setae, respectively; abdominal tergites I–VII each with 1 pair of spinal and 1 pair of marginal setae, respectively; spinal setae on tergites III, V and VII slightly displaced pleurally; tergite VIII with 2 spinal setae. Siphunculi visible.

First instar nymph. Body oval, head and thorax yellow green, and abdomen dark green in life (Fig. 39). Mounted specimens pale, with brown dorsal processes (Fig. 31). Body 0.80–1.06 long and 0.50–0.62 wide. Antennae 4-segmented, segment III
Abdominal tergites I–VII each with 1 pair of spinal and 1 pair of marginal processes, respectively; spinal processes on tergites III, V and VII slightly displaced pleurally; tergite VIII with 2 spinal processes. Each processus with one seta, thick, long and capitate at apex, same as setae of embryos. Spinal processes on tergite II 0.017–0.022 long, with setae 0.095–0.110 long; marginal processes on tergite IV 0.05–0.06 long. Siphunculi truncated. Cauda triangle, with blunt round apex. Anal plate semicircle.

Second instar nymph. Body 1.02–1.27 long and 0.75–0.94 wide (Figs. 32, 40). Antennae 5-segmented, segment III 0.20–0.30 long, basal diameter of the segment 0.0144–0.0192. Spinal processes on tergite II 0.018–0.038 long, with setae 0.087–0.136 long; marginal processes on tergite IV 0.05–0.06 long. Siphunculi truncated. Cauda triangle, with blunt round apex. Anal plate semicircle.

Figures 35–38. Chucallis latusigladius Qiao, Jiang & Chen, sp. n. 35 A population on the underside of leaf of host plant 36–38 Dorsal view of alate viviparous female in life.
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**Third instar nymph.** Body 1.31–1.66 long and 1.11–1.43 wide (Figs. 33, 41). Antennae 6-segmented, segment III 0.21–0.25 long, basal diameter of the segment 0.0192–0.024. Spinal processes on tergite II 0.04–0.05 long, with setae 0.137–0.143 long; marginal processes on tergite IV 0.24–0.31 long. The other characteristics similar to first instar nymph.

**Fourth instar nymph.** Body 1.72–2.06 long and 1.57–1.86 wide (Figs. 34, 42). Antennae 6-segmented, segment III 0.37–0.40 long, basal diameter of the segment 0.0192–0.024. Spinal processes on tergite II 0.05–0.08 long, with setae 0.14–0.18 long; marginal processes on tergite IV 0.36–0.42 long. The other characteristics similar to first instar nymph.

**Specimens examined.** Holotype: alate viviparous female, **CHINA:** Zhejiang (Suichang County, Jiulongshan Mountain, 28.39533°N, 118.84490°E, altitude 450m), 4 June 2011, No. 26816–1–1–1, on *Indocalamus tessellatus*, coll. J. Chen, Q.H. Liu & X.T. Li. Paratypes: 8 alate viviparous females, 2 first instar, 6 second instar, 4 third instar.
instar and 6 fourth instar nymphs, with the same collection data as holotype; 4 alate viviparous females, CHINA: Fujian (Jiangle County, Bailian District, Yujiaoping Village, Longqishan Mountain, 26.52045°N, 117.30568°E, altitude 890m), 17 July 2011, on Indocalamus tessellatus, coll. J. Chen, Q.H. Liu & X.T. Li.

Specimen depositories. All the type specimens of the new species and the other specimens examined are deposited in the National Zoological Museum of China, Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

Taxonomic notes. The new species is similar to the type species C. bambusicola (Takahashi), but differs in colour in life and morphology by the characters given in the key.

Host plant. Indocalamus tessellatus.

Biology. It colonizes the underside of the leaves of the host plant (Fig. 35).

Acknowledgements

Thanks are due to G.X. Zhang, T.S. Zhong, J.H. Li, Q.H. Liu and X.T. Li, for collections and F.D. Yang for making slides. The work was supported by the National Science Funds for Distinguished Young Scientists (No. 31025024), National Natural Sciences Foundation of China (Nos. 30830017, 30970391, 31061160186), National Science Fund for Fostering Talents in Basic Research (No.J0930004), and a grant (No. O529YX5105) from the Key Laboratory of the Zoological Systematics and Evolution of the Chinese Academy of Sciences.

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