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First record of *Takecallis taiwana* (Takahashi) and *T. arundinariae* (Essig) (Hemiptera: Aphididae) in Colombia

Primer reporte de *Takecallis taiwana* (Takahashi) and *T. arundinariae* (Essig) (Hemiptera: Aphididae) en Colombia

Ronald Simbaqueba¹, Francisco Serna¹, and Gary L. Miller²

ABSTRACT

The aphids *Takecallis taiwana* (Takahashi, 1926) and *T. arundinariae* (Essig, 1917) were collected from two locations in the Department of Cundinamarca (Colombia) and one location within 90 km of the city of Bogotá on plants of the *Phyllostachys* sp. (Poaceae: Bambusoideae). This represents the first record of these species from the northern half of South America. Key diagnostic morphological characteristics are given to help distinguish these species. A list of the species and a summary of their distributions are provided.

Key words: *Phyllostachys* sp., aphids, bamboo, identification.

RESUMEN

Los áfidos *Takecallis taiwana* (Takahashi, 1926) y *T. arundinariae* (Essig, 1917) fueron recolectados en dos localidades en el Departamento de Cundinamarca (Colombia) y otra localidad a 90 km de la ciudad de Bogotá, en la planta *Phyllostachys* sp. (Poaceae: Bambusoideae). Estos hallazgos representan los primeros registros de estas especies en el norte de Sudamérica. Como apoyo para la distinción de estas especies, se proporcionan características diagnósticas. Se proporciona también una lista de las especies de *Takecallis* y su distribución.

Palabras clave: *Phyllostachys* sp., áfidos, bambú, identificación.

Introduction

Takecallis Matsumura belongs to the tribe Panaphidini, subfamily Calaphidinae (Favret, 2014). Matsumura (1917) proposed the genus *Takecallis* for the single species *T. bambusae* Matsumura, 1917 (= *Callipterus arundicolens* Clarke, 1903), collected in Hokkaido, Japan, which he described as being similar to *Myzocallis* Passerini, 1860. *Takecallis* and *Myzocallis* share several diagnostic characteristics, but *Takecallis* differs from *Myzocallis* for the following: i) by having an anteriorly directed tubercle with two setae on the clypeus (*Myzocallis* with clypeus smooth, without an anteriorly directed tubercle with two setae); ii) the base of VI antennal segment about equal to the processus terminalis in length (the slender apical part of the sixth antennal segment distal to the primary sensorium on the thickened base); iii) and the rostrum short, extending slightly beyond the forecoxae (Higuchi, 1968; Qiao and Zhang, 2004).

The genus *Takecallis* is represented by six, mostly Oriental and Palaearctic species, but several species are now widely distributed (Tab. 1). Favret *et al.* (2010) observed *T. taiwana* and inferred the presence of *T. arundinariae* (Essig, 1917)

in the Great Smoky Mountains National Park, USA. All *Takecallis* species have been collected on species of bamboo (Poaceae: Bambusoideae). In some parts of Colombia, these plants are of ornamental importance, used as living fences or to conserve natural aquifers (Salas, 2006). The life cycle of *Takecallis* is apparently anholocyclic (Qiao and Zhang, 2004). Adults are mostly known from alate viviparae (Qiao and Zhang, 2004). Ghosh (1986), when describing *T. affinis*, reported two apterous viviparae collected from *Arundinaria jounsarensis* in association with a single alate vivipara, and vagrant alate males. LeClant (1966) observed alate viviparae throughout the year and collected ovipara from *Arundinaria* sp. in Montpellier.

Samples were found during a field trip conducted in February 2014 in the municipalities of Fusagasuga and Cachipay, Cundinamarca, and Bogotá DC, Colombia. The specimens were collected in ethanol [76%] and the specimens were slide-mounted, chiefly following the method of Blackman and Eastop (2000). We identified the species using the keys of Higuchi (1968), Blackman and Eastop (1984, 1994), and Qiao and Zhang (2004). Photomicrographs were taken using an Olympus® CX31 microscope (Olympus Corporation, Japan) with a magnification: 10x; camera: at infinity, and

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TABLE 1. Distribution and hosts of *Takecallis* Matsumura species (Matsumura 1917; Gomez-Menor, 1965; Paik, 1965; Takahashi, 1965; Higuchi, 1968, 1972; Higuchi and Miyazaki, 1969; Stroyan, 1977; Blackman and Eastop, 1984; Ghosh and Quednau, 1990; Tao, 1990; Chan and Frazer, 1993; Blackman and Eastop, 1994; Remaudière and Remaudière, 1997; Foureux and Kato, 1999; Noemberg *et al.*, 1999; Gonzales *et al.*, 2000; Halbert *et al.*, 2000; Delfino 2001; Ortego *et al.*, 2004; Qiao and Zhang, 2004; Mondor *et al.*, 2006; Delfino and Buffa, 2008; Laamari *et al.*, 2010).

Species	Distribution	Host
<i>T. affinis</i> (Ghosh, 1986)	China, Europe, India, Japan, Korea, New Zealand, North America, Taiwan.	<i>Arundinaria jounsarensis</i> , <i>Bambusa</i> sp.
<i>T. arundicolens</i> (Clarke, 1903)	China, Europe, Hawaiian Islands, Japan, Korea, North America, New Zealand, Taiwan.	<i>Phyllostachys</i> sp., <i>Pleioblastus chino</i> , <i>Sasaella ramosa</i> , <i>Sasa nipponica</i> , <i>S. paniculata</i> , <i>S. palmate</i> and <i>S. senaenensis</i>
<i>T. arundinariae</i> (Essig, 1917)	Argentina, Brazil, China, Europe, Hawaiian Islands, India, Japan, Korea, New Zealand, North America, South Africa, Taiwan.	<i>Arundinaria</i> sp., <i>A. graminea</i> , <i>A. japonica</i> , <i>B. lapidea</i> , <i>Bambusa</i> sp., <i>B. rigida</i> , <i>B. stenostachya</i> , <i>B. textilis</i> , <i>Dendroclamus</i> sp., <i>Merostachys</i> sp., <i>Phyllostachys</i> sp., <i>P. aurea</i> , <i>P. castillonis</i> , <i>P. cf. aurea</i> , <i>P. dulcis</i> , <i>P. edulis</i> , <i>P. puberula</i> , <i>P. viridiglaucescens</i> , <i>Pleioblastus amarus</i> , <i>S. palmate</i> , <i>S. senaenensis</i> , <i>Sasa nipponica</i> , <i>Sinobambusa tootsik</i> ,
<i>T. assumenta</i> (Qiao and Zhang, 2004)	China, Europe, India, Japan, Korea, Taiwan, New Zealand, North America.	<i>Bambusa</i> sp.
<i>T. sasae</i> (Matsumura, 1917)	Europe, Hawaiian Islands, Japan, Korea, New Zealand, North America,	<i>Phyllostachys</i> sp., <i>Pleioblastus</i> sp., <i>Sasa nipponica</i> , <i>S. paniculata</i>
<i>T. taiwana</i> (Takahashi, 1926)	Africa, Algeria, Argentina, Brazil, Chile, China, Europe, Hawaiian Islands, India, Japan, Korea, New Zealand, North America and South Taiwan.	<i>Arundinaria anceps</i> , <i>A. gigantea</i> , <i>Bambusa</i> sp., <i>B. stenostach</i> , <i>Phyllostachys</i> sp., <i>P. arcana</i> , <i>P. aurea</i> , <i>P. bambusoides</i> , <i>P. castukkinis</i> , <i>P. dulcis</i> , <i>P. nigra</i> , <i>P. sulphurea</i> , <i>Pleioblastus amarus</i> , <i>Sasa</i> sp.

organized Image-Pro® Insight software (Media Cybernetics, Bethesda, MD).

Material studied

Takecallis taiwana (Takahashi, 1926). **Colombia:** Cundinamarca, Fusagasuga, Avenida de Las Palmas, Barrio Potosí, 04°20'14"N, 74°21'52"W, 1,700 m a.s.l., 11.ii.2014, coll. R. Simbaqueba, *ex* leaves of *Phyllostachys* sp. (Poaceae), 5 slides and 5 specimens in alcohol [76%]; ***Takecallis arundinariae*** (Essig, 1917). **Colombia:** Cundinamarca, Fusagasuga, Avenida de Las Palmas, Barrio Potosí, 04°20'14"N, 74°21'52"W, 1,700 m a.s.l., 11.ii.2014, coll. R. Simbaqueba, *ex* leaves of *Phyllostachys* sp. (Poaceae) 5 slides and 5 specimens in alcohol [76%]; **Colombia:** Cundinamarca, Bogota, Park Way, 04°38'N, 74°04'W, 2600 m a.s.l., 20.iii.2014, coll. R. Simbaqueba, *ex* leaves of *Phyllostachys* sp. (Poaceae), 5 slides and 5 specimens in alcohol [76%]; **Colombia:** Cundinamarca, Cachipay, San Jose, 04°43'N, 74°26'W, 1100 m a.s.l., 20.iv.2014, coll. R. Simbaqueba, *ex* leaves of *Phyllostachys* sp. (Poaceae), 5 slides and 5 specimens in alcohol [76%], UNAB catalogue numbers 884 and 885, respectively. All material deposited at the Museo Entomologico UNAB, Universidad Nacional de Colombia, Facultad de Ciencias Agrarias, Bogota, Colombia.

Biology. Collected in small, scattered "colonies" (1–3 individuals per leaf) composed of nymphs and adults on *Phyllostachys* sp.

***Takecallis taiwana* (Takahashi, 1926) (Fig. 1)**

Diagnosis. Alate vivipara, length 1.57–1.83 mm. Head smooth, without antennal tubercles, clypeus with an anteriorly directed tubercle with 2 setae (Fig. 1). Antenna 0.8X the body length. Usually, 5–6 secondary rhinaria, organized toward first third of III. Rostrum short, extending slightly beyond the forecoxae. First tarsal segments with 5–7 setae. Abdominal segments I–IV with a pair of dorsal tuberculate processes, markedly long on I and II, each possessing a seta. Siphunculi short, without setae. Cauda knobbed with 14–16 setae. Anal plate bilobed. Genital plate with 17–20 setae (Blackman and Eastop, 1994).

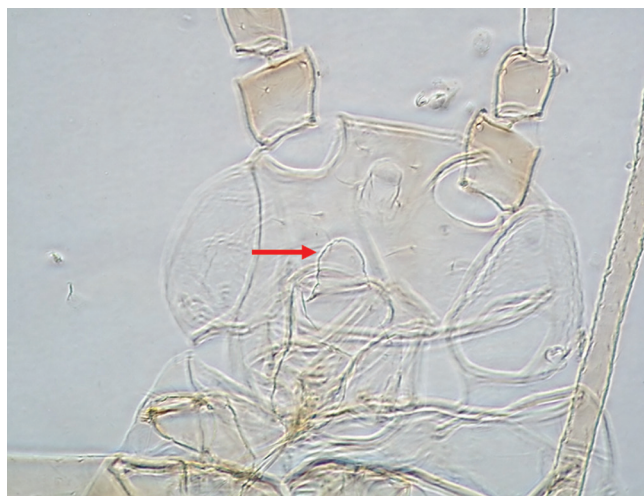


FIGURE 1. *Takecallis taiwana* (Takahashi, 1926), Alate vivipara, clypeus with an anteriorly directed tubercle with two setae.

***Takecallis arundinariae* (Essig, 1917) (Fig. 2)**

Diagnosis. Alate vivipara, length 1.5–2.0 mm. Head smooth, without antennal tubercles, with a brown medial longitudinal line. Antenna 1.2X length of the body. Usually having 4–8 secondary rhinari. Rostrum short, just reaching the forecoxae. First tarsal segments with 9 setae. Abdomen with two brown, dorsomedial rows of tuberculate processes, each with 1 seta (Fig. 2), abdominal segment VIII with 2–4 setae. Siphunculi short, with 1 seta. Cauda knobbed with 12–15 setae. Anal plate bilobed. Genital plate with 18–24 setae (Blackman and Eastop, 1994).



FIGURE 2. *Takecallis arundinariae* (Essig, 1917), Alate vivipara, abdomen with two brown, dorsomedial rows of tuberculate processes, each with one seta.

Takecallis taiwana and *T. arundinariae* are recorded in the South American countries Argentina, Brazil, Chile and now in Colombia (Fig. 3), associated with hosts belonging to the subfamily Bambusoideae (Poaceae). In Colombia, associated with *Bambusa vulgaris* plants, the aphid *Hysteronura setariae* (Thomas 1978) has also been recorded on this host (Gallego and Velez, 1992; Madrigal, 2003).

Genus *Takecallis* Matsumura, particularly *T. taiwana* (Takahashi), was recorded for the first time in South America by Foureaux and Kato (1999), found in Minas Gerais (Brazil), on *Phyllostachys* cf. *aurea* (Poaceae). The same year, Noemberg *et al.* (1999) reported *T. arundinariae*, in São Paulo (Brazil), collected on *Dendroclamus* sp. and *Merostachys* sp. (Poaceae). Further south on the continent, in the metropolitan area of Chile, Gonzales *et al.* (2000) found *T. taiwana* on Bambusoideae (Poaceae). For Argentina (provinces of Córdoba, Mendoza and Buenos Aires city), Delfino (2001) recorded *T. arundinariae* for the first time, collected on *Arundinaria* sp. (Poaceae), and on another unidentified bamboo. Meanwhile, Saini *et al.* (2002) records

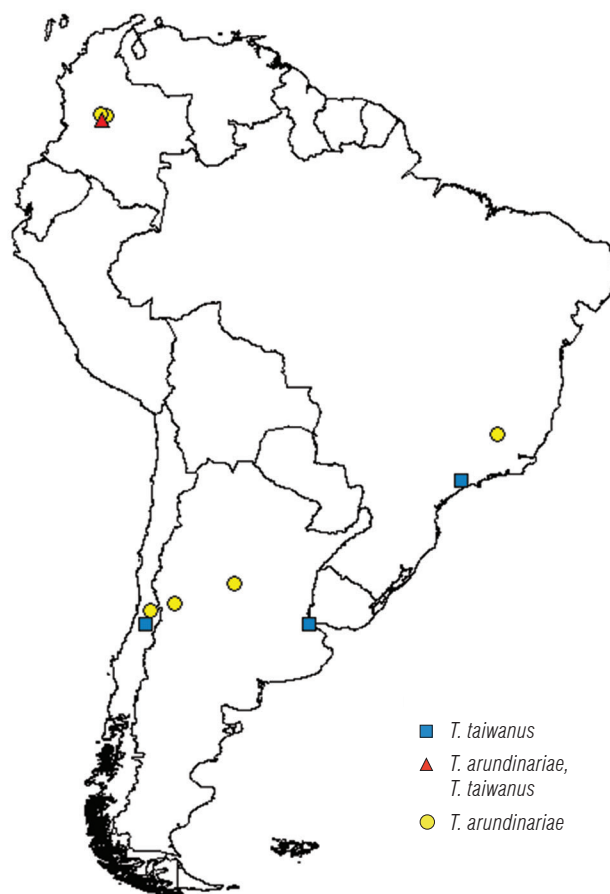


FIGURE 3. Distribution records of *Takecallis taiwana* and *T. arundinariae* in South America.

T. taiwana for Mendoza (Argentina), on an unidentified bamboo. Ortego *et al.* (2004) recorded *T. arundinariae* for Chile (San Fernando province of Rancagua), on an unidentified bamboo. Delfino and Buffa (2008) identified two species of aphids for Argentina, on *Phyllostachys aurea* (Poaceae), a plant of ornamental importance.

We do not know with certainty when these aphid species were introduced to the southern part of the South American continent. We can infer that their arrival was through transport of their host plants (Bambusoideae). It can be said that weather conditions do not limit the presence of *T. arundinariae* and *T. taiwana*, given the wide variety of environments in the countries where they have been found. Apparently, these species have no difficulty in establishing colonies in new environments and it can be assumed that they exist throughout the continent (Fig. 3).

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