NEW RECORDS ON THE GEOGRAPHICAL DISTRIBUTION OF SOUTH AMERICAN SHARPSHOOTERS (CICADELLIDAE: CICADELLINAE: PROCONIINI) AND THEIR POTENTIAL AS VECTORS OF *XYLELLA FASTIDIOSA*

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The Proconiini comprises 422 species distributed in the continental Americas, the highest biodiversity is found in the Neotropical Region (Wilson et al. 2009). Members of the tribe Proconiini have been identified as vectors of many diseases caused by the bacteria *Xylella fastidiosa* Wells et al. 1978, which occurs only in the xylem of plants (Marucci et al. 2002).

Strains of *X. fastidiosa* cause diseases such as "Pierce's Disease" (PD) in grape (*Vitis vinífera* L.), "Phony Peach Disease" (PPD), "Coffee Leaf Scorch" (CLS), "Oleander Leaf Scorch" (OLS), and "Citrus Variegated Chlorosis" (CVC) among others. These incurable maladies produce substantial economic losses in a diverse variety of crops (Hernandez-Martinez et al. 2006).

In South America the major threat is CVC which has spread rapidly throughout Brazil (Lopes 1996). *X. fastidiosa* is also present in United States, México, Venezuela, Brazil, Paraguay, Uruguay, Argentina (Redak et al. 2004), and Costa Rica (Aguilar et al. 2005). However, CVC is not yet reported from the USA although it has the potential to threaten orange (*Citrus* × *sinensis* (L.) Osbeck) production in the Americas if a suitable vector is available (Damsteegt et al. 2006).

Diseases caused by *X. fastidiosa* have attained great importance worldwide as insect vectors of this pathogen have demonstrated an ability to spread, as happened with *Homalodisca vitripennis* (Germar), which invaded many islands in the Pacific Ocean (Pilkington et al. 2005). Pathogen acquisition and transmission by sharpshooters occurs because these insects feed exclusively on xylem fluids (Young 1968).

Despite this obvious importance, there are few studies from South America that have identified Proconiini species that can transmit *X. fastidiosa*. Moreover, there is no basic information on biology, geographic distributions, phenology, natural enemies or host plant associations for many South American Proconiini species. To address this shortcoming, work presented here provides new distributional records for thirteen South American Proconiini sharpshooters that may be potential vectors of *X. fastidiosa*.

The examined material is deposited in the following entomological collections of Argentina: Instituto Miguel Lillo (IMLA); Museo de Ciencias Naturales de La Plata (MLP) and Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia' (MACN). Specific identification and distributional data were compiled from Young (1968), Marucci et al. (2002) and Wilson et al. (2009).

Examined Material

Acrogonia citrina Marucci & Cavichioli, PARAGUAY: Carumbé, III-1965, Golbach Leg., 1♂, 1♀, without information on host plant and collecting method (IMLA).

Acrogonia flavoscutellata (Signoret), ECUADOR: Santo Domingo, IV-1958, Weyrauch Leg., 1♀, without information on host plant and collecting method (IMLA).

Dechacona missionum (Berg), URUGUAY: 1♂, without date, no information on host plant and collecting method (MACN).

Diestostemma huallagana Young, BOLIVIA: 1♂ without date and locality (MACN).

Molomea consolida Schröder, ECUADOR: El Puyo, IV-1958, 1♂. PERÚ: Tingo María, 1♂; Chanchamayo, II-1939, 1♂ (IMLA). BOLIVIA: Santa Cruz, I-1958, Wygodzinsky Leg.; 1♂ (IMLA), 1♀ (MACN), without information on host plant and collecting method.

Molomea personata (Signoret), PERÚ: Fundo Génova, IV-2002, Logarzo-Varone Legs., 8♀♀, on papaw; V-2002, Logarzo Leg., 2♀♀, on grasses, by sweeping (IMLA).

Ochrostacta diadema (Burmeister), PARAGUAY: Itagua, I-1957, Montes Leg., 3♀♀, without information on host plant and collecting method (MLP).

Oncometopia rubescens Fowler, PERÚ: Fundo Génova, IV-2002, Logarzo Leg., 14♂♂, 16♀♀, on grasses and papaw; V-2002, Logarzo Leg., 16♂♂,

4♀♀, by sweeping (IMLA). PARAGUAY: Carumbé, San Pedro, I-1971, Golbach Leg., 1♀, without collecting method (IMLA).

Proconia fusca Melichar, BOLIVIA: 9♂♂, 4♀♀, without information on host plant and collecting method (MACN).

Tapajosa doeringi (Berg), PERÚ: Cuzco, Machu Picchu, II-1952, Monrós Leg., 1♂, without information on host plant and collecting method (IMLA).

Tapajosa rubromarginata (Signoret), PARAGUAY: Caaguazú, XII-2000, Logarzo Leg., 1♂, on weeds (MLP).

Tapajosa similis (Melichar), BRAZIL: I-1948, Cuezzo Leg., 1♂, without information on host plant and collecting method (IMLA).

Tretogonia callifera Melichar, PARAGUAY: Carumbé, 3♂♂, 2♀♀; Caaguazú, I-1965, 2♂♂, 3♀♀, without information on host plant and collecting method (IMLA).

In Table 1, we summarize the species recorded for Central and South America, the presence of *X. fastidiosa* and the new distribution data for the species listed here. Sharpshooters are known to occur in 24 of the 37 Central and S. America countries. No data are available for some islands associated with Central America and the Caribbean. This lack of information about the Proconiini in these countries is probably due to a deficiency in surveys and collections and not because of the absence of representatives of these insects in those territories.

Most studies investigating the transmission of *Xylella* have been conducted in the USA. In the Neotropics, the majority of studies have been made in Brazil (Redak et al. 2004). Some South America countries, such as Perú, Bolivia, Colombia, and Ecuador have more than 50 sharpshooter species capable of vectoring *X. fastidiosa*, but no reference to occurrence of this bacterium in those countries is available.

Most South American countries are at risk from *X. fastidiosa* because the bacterium has a wide host range and may be transported accidently to new areas via infected plant species. There are strong epidemiological relationships between the presence of Proconiini sharpshooters and incidence of the bacterium. Resulting diseases can take months or years to develop significant symptoms, or infections may remain asymptomatic and undetected while acting as reservoirs from which continued bacterial transmission can occur (Hopkins 1989).

We thank the museum curators who provided access to the specimens used from their entomological collections.

TABLE 1. KNOWN AND NEW DISTRIBUTION RECORDS FOR 13 SPECIES OF PROCONIINI COLLECTED IN CENTRAL AND SOUTH AMERICA.

	Acrogonia citrina	*Acrogonia flavoscutellata*	*Dechacona missionum*	*Diestostemma huallagana*	*Molomea consolida*	*Molomea personata*	*Ochrostacta diadema*	*Oncometopia rubescens*	*Proconia fusca*	*Tapajosa doeringi*	*Tapajosa rubromarginata*	*Tapajosa similis*	*Tretogonia callifera*	*Presence of X. fastidiosa*	*Total specimens*
Argentina			*		*		*			*	*	*		*	38
Bolivia			*	X	X				X				*		58
Brazil	*	*	*	*	*	*	*	*			*	X	*	*	142
British Guiana		*													18
Colombia		*						*					*		65
Costa Rica								*						*	49
Ecuador		X			X			*							68
El Salvador		*													12
French Guiana		*											*		25
México														*	80
Panama		*						*							30
Paraguay	X		*		*		X	X			X		X	*	24
Perú			*	*	X	X		X	*	X			*		95
Suriname													*		14
Uruguay			X				*								8
Venezuela		*						*						*	47

*Data from Young 1968, Takiya 2008, and Wilson et al. 2009.
X—Present work.

SUMMARY

Xylella fastidiosa is endemic to the Americas, it causes economically important diseases in a variety of different crops, and is transmitted by xylem-feeding sharpshooters. This paper provides new geographic records for Proconiini sharpshooters in South America which helps to better understand their distribution. To develop these new records, we examined material from 3 of the main entomological collections held in Argentina. As a result, 5 species are cited for the first time from Paraguay; 4 for Perú; 3 for Bolivia; 2 for Ecuador; and 1 each for Uruguay and Brazil. Some of the species could be vectors of *X. fastidiosa* because congeners of the species studied here are known to transmit this bacterium.

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