

**The Native Psyllid *Mastigimas anjosi* (Hemiptera: Calophyidae): First Record and Abundance on Pink Cedar, *Cedrela fissilis* (Meliaceae), Trees in São Paulo, Brazil**

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# The native psyllid *Mastigimas anjosi* (Hemiptera: Calophyidae): first record and abundance on pink cedar, *Cedrela fissilis* (Meliaceae), trees in São Paulo, Brazil

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Pink cedar, *Cedrela fissilis* Vell. (Meliaceae), is endemic to the Brazilian Atlantic Forest, and is found in much of the interior of Brazil, under both dry and wet conditions (Pineiro et al. 1990; Lisboa 1994). It is also found widely in Central and South America (Carvalho 2003). This plant has slow growing, dense, and hard wood, and since 1998 has been included on the List of Threatened Species (IUCN 2016). *Cedrela fissilis* can be heavily damaged by the mahogany shoot borer, *Hypsipyla grandella* Zeller (Lepidoptera: Pyralidae), which slows its development (Pereira et al. 2016). The purpose of this study was to identify and report on the occurrence of psyllids observed on pink cedar plants in the region of Sorocaba (23.5778 °S and 47.5216 °W), São Paulo State, Brazil.

Twenty insects were collected in January 2016, packed in bottles with 70% alcohol and sent to Dr. Daniel Burckhardt of Naturhistorisches Museum, Basel, Switzerland for identification. A survey of these psyllids and of its natural enemies were carried out on 2 *C. fissilis* plants, each with one trap consisting of yellow plastic cards with adhesive on both sides and a capture area of 100 cm<sup>2</sup> on each side (Ferreira-Filho et al. 2008). Each trap was attached to a *C. fissilis* plant, at approximately 2.5 m height.

A total of 7 samples were collected from each tree, at approximately 15 d intervals. The traps were replaced, wrapped in transparent plastic film to avoid damage to the insects captured, and labelled. The traps were stored at 0 °C until tabulating the psyllids and potential natural enemies. The insects were tabulated using a stereoscopic microscope with 10X magnification.

Infested leaves were yellowish, covered with sooty mold, and displayed early leaf drop when supporting immature and adult psyllids in the field (Fig. 1A, B, C, D). A total of 382 psyllids were collected in the sticky traps, consisting of 249 males and 133 females, from Aug to Nov 2015, with the highest numbers captured in Aug.

The psyllids were identified as *Mastigimas anjosi* Burckhardt, Queiroz D., Queiroz E., Andrade, Zanol, Rezende & Kotrba (Hemiptera: Psylloidea: Calophyidae), which are native to Brazil. In general appearance, they are similar to a small cicada, with the females measuring 4.8 to 5.5 mm and the males 4.2 to 5.0 mm (Fig. 1E, F). This psyllid was described in commercial plantations of *Toona ciliata* M. Roem. var. *australis* (Meliaceae) in Brazil (Burckhardt et al. 2011) causing rolling,

deformation of the leaves, chlorosis, spotting, and necrosis of the foliage (Costa et al. 2015).

*Mastigimas anjosi* has been reported from Bananal (São Paulo), Colombo (Paraná), Florestal and Ouro Branco in 2008 and 2009 (Burckhardt et al. 2011), from Conselheiro Lafaiete (Minas Gerais) in 2009 on *T. ciliata* plants (Queiroz et al. 2013), and from Lavras (Minas Gerais) in 2010 (Burckhardt et al. 2011) and Curitiba (Paraná) in 2013 on *C. fissilis* plants (Queiroz et al. 2013). *Mastigimas* spp. affect plants of the genera *Cedrela* and *Toona* and have wide geographical distribution. They are found from Mexico, Central America and the Caribbean, south to Brazil and Bolivia (Hodkinson 1989; Burckhardt et al. 2013). *Mastigimas anjosi* has five instars, with the nymphs light greenish-yellow in color on most of its body. The adult has stripes and brown spots on the abdomen and membranous wings, and brown wing venation (Burckhardt et al. 2011; Queiroz et al. 2013).

We observed *Cycloneda sanguinea* L. (Coleoptera: Coccinellidae) larvae and *Atopozelus opsimus* Elkins (Hemiptera: Heteroptera: Reduviidae) nymphs and adults preying on immatures of *M. anjosi* on *C. fissilis* leaflets. In addition, flower fly larvae (Diptera: Syrphidae) and lacewing (Neuroptera: Chrysopidae) eggs and adults were observed near the colonies of this psyllid on *T. ciliata* trees in Minas Gerais State, Brazil (Queiroz et al. 2013; Costa et al. 2015). *Psyllaephagus trioziphagus* Howard (Hymenoptera: Encyrtidae) has been observed to parasitize immature *M. anjosi* and, although not a specific parasitoid, was reported as a possible control agent of this pest in Brazil (Costa et al. 2015).

In conclusion, *M. anjosi* can infest and damage *C. fissilis* trees, reducing the development of this plant in natural and restored areas in Brazil. Populations of this psyllid can be monitored using yellow sticky traps.

## Acknowledgments

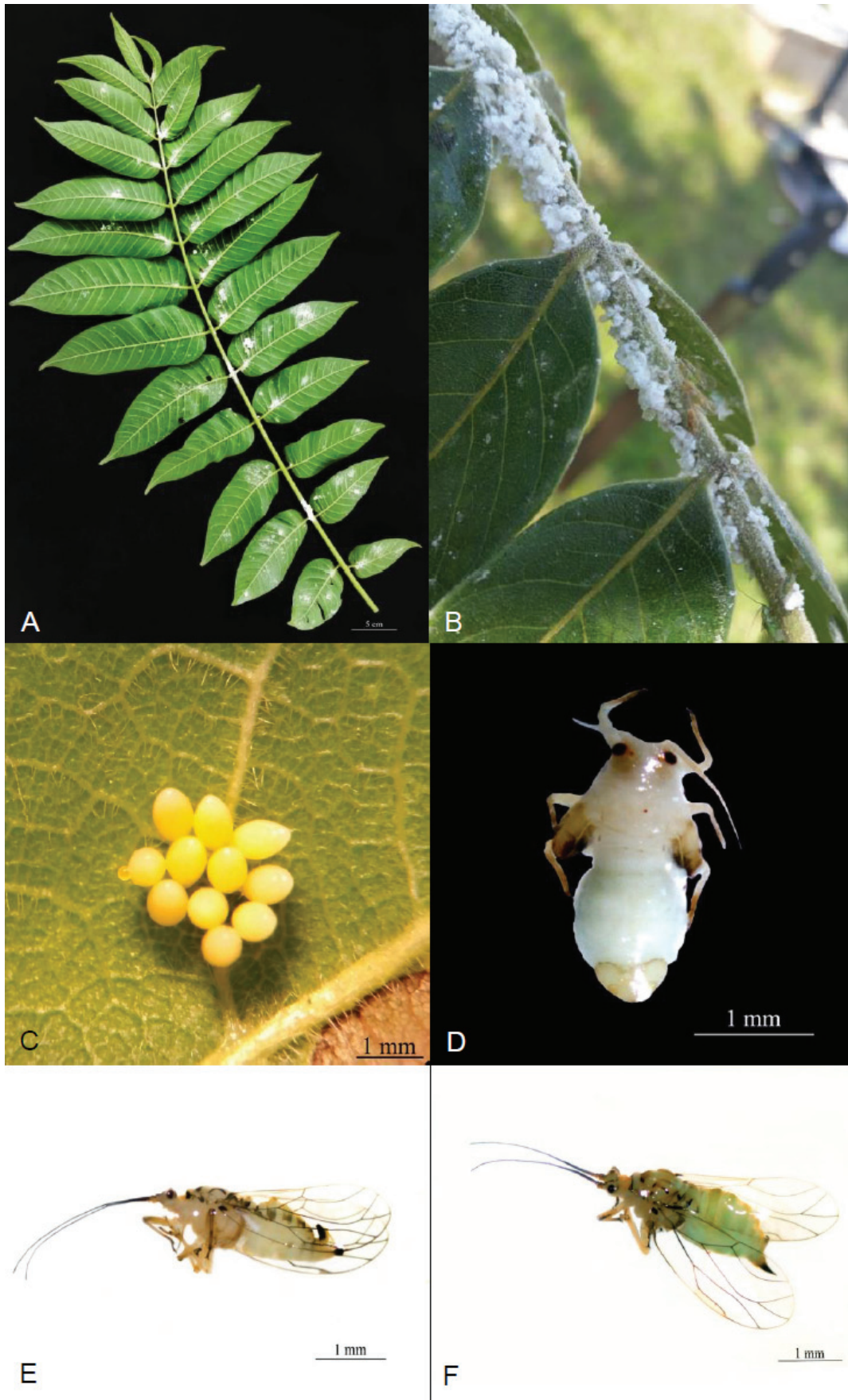
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**Fig. 1.** *Cedrela fissilis* (Meliaceae) leaf showing (A) infestation *Mastigimas anjosi* (Hemiptera: Calophyidae) on the abaxial surface, and (B) closer view of immatures and adults heavily infesting a leaf. *Mastigimas anjosi* eggs (C), fifth instar (D), male (E) and female (F). Sorocaba, São Paulo State, Brazil.

Estado de Minas Gerais, Brasil. Dr. Phillip John Villani (The University of Melbourne, Australia) revised and corrected the English language used in this manuscript.

## Summary

The objective of this study was to identify and report on the occurrence of Psylloidea damaging pink cedar, *Cedrela fissilis* Vell. (Meliaceae), plants in the municipality of Sorocaba, in the southern region of São Paulo State, Brazil. Psyllids were collected on *C. fissilis* plants, and sent to authorities for identification. Psyllids damaging *C. fissilis* plants in urban areas and fragments of semideciduous seasonal forest were identified as *Mastigimas anjosi* Burckhardt, Queiroz D., Queiroz E., Andrade, Zanol Rezende & Kotrba (Hemiptera: Psylloidea: Calophyidae), which is native to Brazil. *Cedrela fissilis* also is endemic to Brazil, and has high ecological and economic value. It is harvested for timber production and is on the endangered species list. This is the first report of *M. anjosi* damaging *C. fissilis* plants in São Paulo State, Brazil and the importance of this plant for conservation and ecological restoration areas in Brazil justifies research to develop management programs for this psyllid.

Key Words: biological control; forest pest; monitoring; population dynamics; sticky trap

## Sumario

O objetivo desse estudo foi identificar e relatar a ocorrência de indivíduos de Psylloidea danificando cedro rosa, *Cedrela fissilis* Vell. (Meliaceae) em Sorocaba, São Paulo, Brasil. Psilídeos foram coletados em plantas de *C. fissilis*, acondicionados e enviados para identificação. O psilídeo danificando *C. fissilis* em áreas urbanas e em fragmentos de floresta estacional semidecidual foi identificado como *Mastigimas anjosi* Burckhardt, Queiroz D., Queiroz E., Andrade, Zanol Rezende & Kotrba (Hemiptera, Psylloidea, Calophyidae), nativo do Brasil. *Cedrela fissilis* é nativa do Brasil, tem elevado valor ecológico e econômico, é cortada para produção de madeira e está na lista de espécies ameaça-

das. Esse é o primeiro relato de *M. anjosi* danificando *C. fissilis* no estado de São Paulo, Brasil e a importância dessa planta em áreas nativas e de restauração ecológica do país justificam estudos visando o manejo desse psilídeo.

Palavras Chave: controle biológico; praga florestal; monitoramento; dinâmica populacional; armadilha adesiva

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