



NOTE

Interaction of the jumping plant-louse *Mastigimas anjosi* (Hemiptera: Calophyidae) nymphs by *Polybia platycephala* (Hymenoptera: Vespidae) in *Cedrela fissilis* (Meliaceae) trees

Interacción de ninfas del psílido *Mastigimas anjosi* (Hemiptera: Calophyidae) por *Polybia platycephala* (Hymenoptera: Vespidae) en árboles de *Cedrela fissilis* (Meliaceae)

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Abstract

Mastigimas anjosi (Hemiptera: Calophyidae) is a psyllid that attacks commercially important trees such as *Cedrela fissilis*, whose control is carried out mainly through the use of insecticides. Among the symptoms of *M. anjosi* infestation, the white flocculent waxy secretions produced by the nymphs on plant tissues act as a physical protective barrier against predators. Thus, this note aims to report an attempted predation of *M. anjosi* nymphs by the social wasp *Polybia platycephala* (Hymenoptera: Vespidae) on a *C. fissilis* tree in southeastern Brazil. Observations were conducted in May and June 2025, in southern Minas Gerais State, within the Atlantic Forest biome. Although individuals of *P. platycephala* were not successful at overcoming the protective barrier of *M. anjosi*, the behavior observed indicates a potential predatory interaction or honeydew-feeding behavior.

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Therefore, this interaction should be further investigated, particularly regarding the potential use of social wasps as agents in the biological control of *M. anjosi*.

Keywords: Ethology; Meliaceae; psyllid; secretion.

Resumen

Mastigimas anjosi (Hemiptera: Calophyidae) es un psílido que ataca árboles de interés comercial, como *Cedrela fissilis*, cuyo control se realiza principalmente mediante el uso de insecticidas. Entre los síntomas de infestación por *M. anjosi*, las secreciones cerosas blancas y floculentas producidas por las ninfas en los tejidos vegetales funcionan como una barrera física de protección contra los depredadores. De esta manera, esta nota tuvo como objetivo reportar el intento de depredación de ninfas de *M. anjosi* por la avispa social *Polybia platycephala* (Hymenoptera: Vespidae) en un árbol de *C. fissilis* en el sudeste de Brasil. Las observaciones se realizaron entre mayo y junio de 2025, en el sur del estado de Minas Gerais, en el bioma Mata Atlántica. Aunque los individuos de *P. platycephala* no lograron superar la barrera de protección de *M. anjosi*, el comportamiento exhibido indica una posible interacción de depredación o consumo de honeydew. Por lo tanto, esta interacción debe investigarse con mayor profundidad, especialmente considerando el potencial uso de avispas sociales en el biocontrol de *M. anjosi*.

Palabras clave: Etología; Meliaceae; psílido; secreción

The jumping plant-louse *Mastigimas anjosi* Burckhardt et al. 2011 (Hemiptera: Calophyidae) is a Brazilian native psyllid that attacks commercially important tree species of the family Meliaceae, such as Australian red cedar, *Toona ciliata* M. var. *australis* Roemer (F. Muell) Bahadur, and cedarwood, *Cedrela fissilis* Vell. (Burckhardt, Queiroz & Drohojowska, 2013; Costa, Queiroz & Anjos, 2015; Ferreira-Filho et al., 2017). The main damage caused to host plants infested by this species includes abscission, chlorosis, curling, deformation, spotting, necrosis, and the formation of sooty mold on the leaves (Costa et al., 2015). Another characteristic symptom of *M. anjosi* infestation is the white flocculent waxy secretions produced by nymphs on host plant tissues (Burckhardt et al., 2011).

The use of chemical insecticides is the main method for controlling *M. anjosi* infestations (Queiroz, Burckhardt & Anjos, 2013). Therefore, information on potential natural enemies may be useful to support sustainable population control strategies, such as biological control (Matos, Abreu, Lemes, Zanuncio & Zanuncio, 2019), thereby reducing the use of pesticides.

Thus, the aim of this study was to document a possible interaction on *M. anjosi* nymphs by the social wasp *Polybia platycephala* Richards, 1978 on a *C. fissilis* tree in southeastern Brazil.

The observations were made opportunistically at the teaching farm of the Instituto Federal do Sul de Minas Gerais, Campus Inconfidentes (IFSULDEMINAS), in the municipality of Inconfidentes (22° 19' 00" South, 46° 19' 40" West), in the southern region of Minas Gerais. The study site is located in a human-modified area composed of buildings and coffee plantations, adjacent to a fragment of semideciduous forest within the Atlantic Forest domain. The behavioral acts were recorded on May 23, June 2, and November 25, 2025, starting at 14:00 h. Four observation sessions were conducted on each day, each lasting 15 minutes, using the *ad libitum* method (Del Claro, 2010), totaling three hours of ethological records.

After the observations, the social wasps were collected using an entomological net, and the nymphs were manually collected and placed in vials containing 70% ethanol, then transported to the Zoology Laboratory of IFSULDEMINAS. Subsequently, the specimens were prepared and dry-mounted. The social wasp was identified using the dichotomous key of Richards (1978) and by comparison with the collection of coleção biológica de vespas sociais (CBVS), the psyllids were identified based on Burckhardt et al. (2011), the ant by MSc. Gabriel Magalhães Cardoso of Universidade Federal de Minas Gerais, UFMG, and the plant was identified by botanist Laercio Loures.

The social wasp individuals were observed foraging mainly on the lower branches, located up to approximately 1.70 meters above the ground, on a *C. fissilis* tree about five meters tall (Fig. 1A). The presence of *M. anjosi* nymphs (Fig. 2A–D) was confirmed, predominantly on the veins of the abaxial surface of the leaves. In addition to the social wasps, *Camponotus rufipes* (Fabricius, 1775) ants were observed near the psyllids, which established protective interactions, since they displayed agonistic behavior toward the wasps that approached the psyllids.

Up to three *P. platycephala* individuals foraged simultaneously on the *C. fissilis* leaves, antennating the surface of the nymphs's protective secretion for at least 30 seconds before attempting to bite it (Fig. 1B–C). After repeated unsuccessful attempts to break through the barrier, the *P. platycephala* individuals moved to other infested leaves and repeated the same behavior. During all attempts by *P. platycephala* to access the nymphs, the *M. anjosi* individuals remained apparently motionless until the social wasps gave up.

The ants *C. rufipes* interacted with the nymphs and adults of *M. anjosi* (Fig. 3A) by antennating the honeydew produced by these individuals (Fig. 3B–C), but no direct interactions were observed between social wasps and adults of *M. anjosi*.

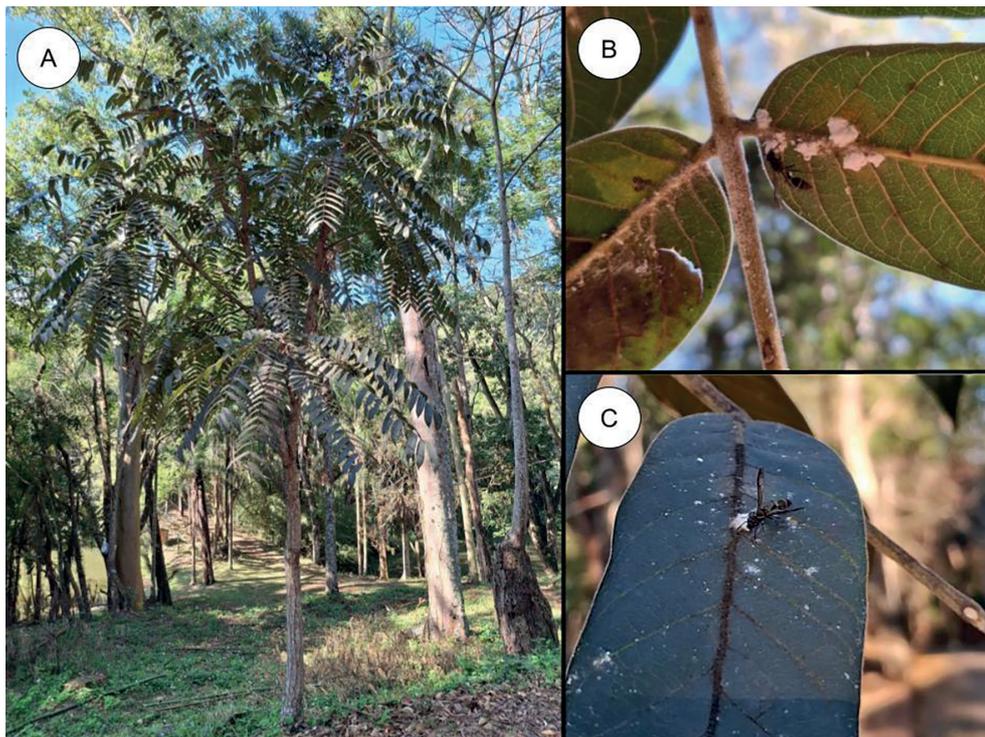


Fig. 1. Attempted predation of *Mastigimas anjosi* by the social wasp *Polybia platycephala*. A – *Cedrela fissilis* tree where the behavior was observed; B, C – attempts by *P. platycephala* individuals to access *M. anjosi* nymphs. Photography: Laura T. I. Borges.

Fig. 1. Intento de depredación de *Mastigimas anjosi* por la avispa social *Polybia platycephala*. A – árbol de *Cedrela fissilis* donde se observó el comportamiento; B, C – intento de acceso a las ninfas de *M. anjosi* por individuos de *P. platycephala*. Fotografía: Laura T. I. Borges.

Social wasps have generalist and opportunistic diets and prey on a wide variety of insects, which makes them agents of ecosystem services (Prezoto et al., 2019; Brock, Cini & Sumner, 2021). Due to these feeding habits, wasps have the potential to control pests in agricultural crops (Medeiros et al., 2019). There are also reports of species of the genus *Polybia* preying on insects of the order Hemiptera (see e.g. Gobbi & Machado, 1985; Machado, Gobbi & Alves, 1988; Bichara-Filho et al., 2009; Hernández & Fernández, 2009; López, Hernández & Caraballo, 2013; Oliveira, Custódio, Vilela & Souza, 2024), including *P. platycephala* (Prezoto, Lima & Machado, 2005). Additionally, social wasps may also establish interactions with these insects for the honeydew consumption (see e.g. Araújo et al., 2024; Oliveira, Crispim, Vilela & Souza, 2025).

Although the *P. platycephala* individuals were unable to break through the white flocculent waxy secretion produced by *M. anjosi*, there are two potential explanations for why the social wasps attempted to access the *M. anjosi* nymphs.

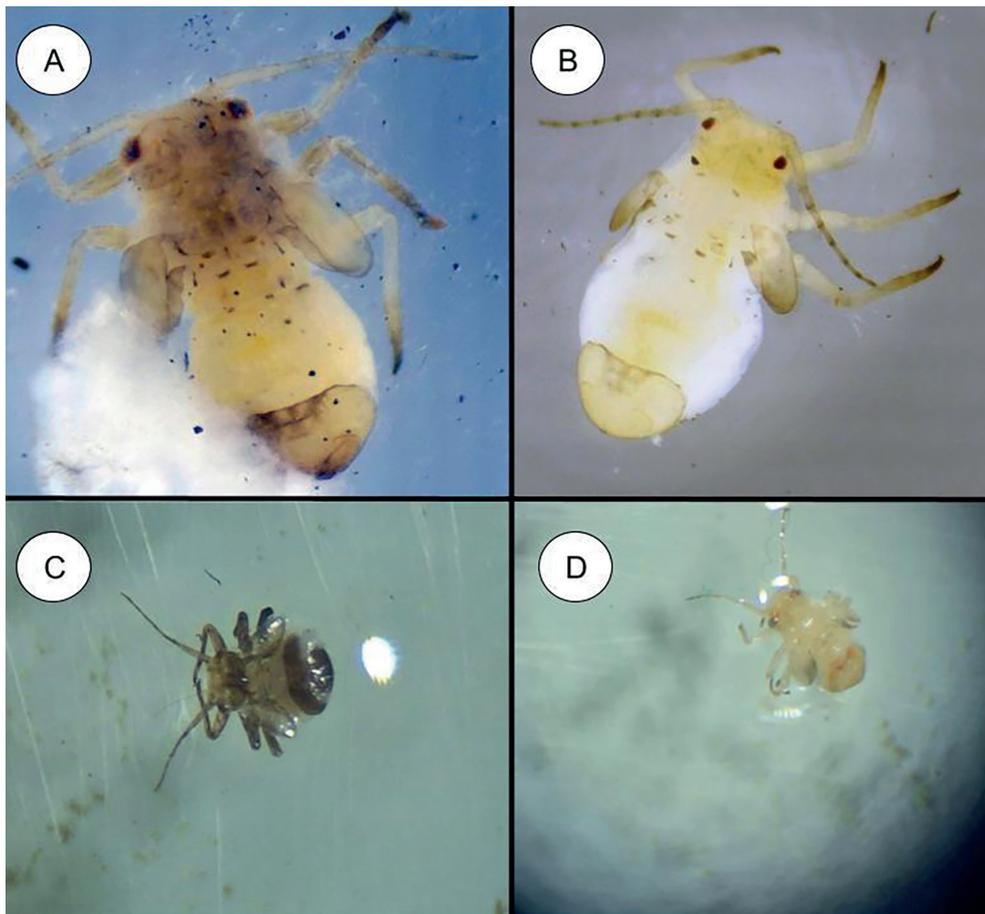


Fig. 2. A–D – *Mastigimas anjosi* nymphs, Calophyidae. Photography: Laura T. I. Borges.

Fig. 2. A–D – Ninfas de *Mastigimas anjosi*, Calophyidae. Fotografia: Laura T. I. Borges

First, a predation attempt, since these insects prey on different species of Hemiptera (Kasper, Reeson, Cooper, Perry & Austin, 2004; Custódio, Oliveira, Vilela & Souza, 2024). Moreover, other insects, such as *Atopozelus opsimus* Elkins, 1964 (Hemiptera: Reduviidae), have been reported as predators of *M. anjosi* nymphs and adults (Matos et al., 2019). Although the authors did not describe the behavior in detail, it is presumed that *A. opsimus* individuals were successful at overcoming the physical protective barrier to access and prey upon *M. anjosi* nymphs. In addition to predators, other natural enemies of *M. anjosi* include parasitoid wasps, such as *Psyllaephagus trioziphagus* (Howard, 1885) (Hymenoptera: Encyrtidae), which parasitize the immature stages of this psyllid (Costa et al., 2015).

Second, a possible honeydew-feeding behavior, which is supported by the fact that different species of social wasps use this substance as a food resource (Oliveira et al., 2025). Moreover, the consumption of honeydew produced by *M. anjosi* has been observed in individuals of *A. opsimus*, which, in addition to preying on nymphs and adults of *M. anjosi*, also consumed the honeydew excreted by this psyllid (Matos et al., 2019).

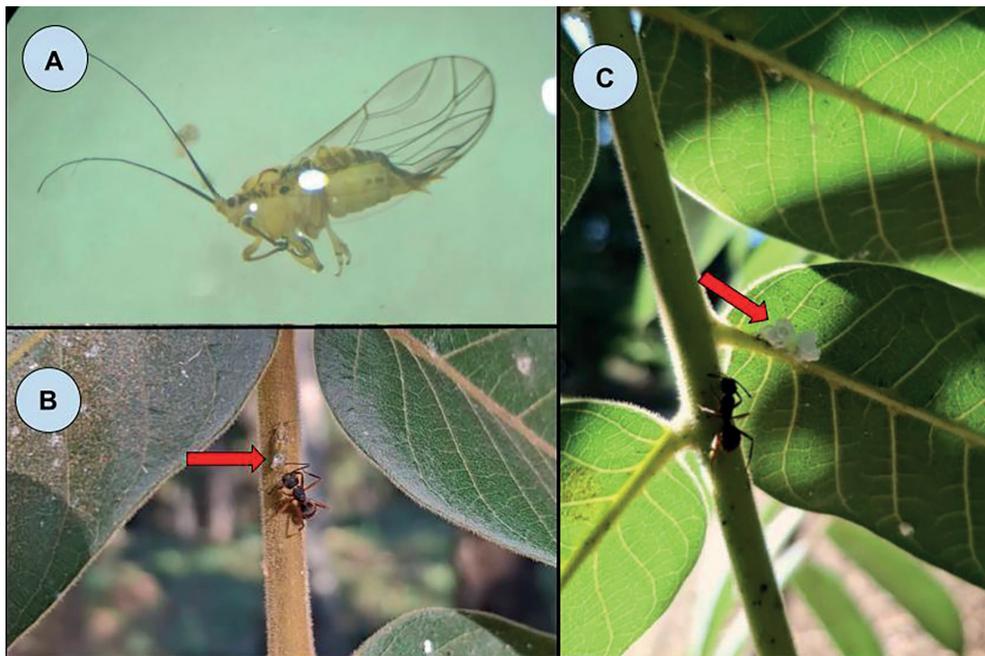


Fig. 3. A – *Mastigimas anjosi* adult. Interaction between *Camponotus rufipes* ants and *M. anjosi*, B – adults and C – nymphs (B–C: red arrows indicate the honeydew produced). Photography: Laura T. I. Borges

Fig. 3. A – Adulto de *Mastigimas anjosi*. Interacción entre las hormigas *Camponotus rufipes* y *M. anjosi*, B – adultos y C – ninfas (B–C: las flechas rojas indican el honeydew producido). Fotografía: Laura T. I. Borges

Thus, it is possible that *P. platycephala* individuals also consumed the honeydew or were at least attracted to it., as occurred with the ants *C. rufipes*.

Ants of the genus *Camponotus* are known to establish protective interactions with different hemipteran insects in exchange for the consumption of honeydew produced by these insects (Fernandes, Fagundes, Greco, Barbeitos & Santo, 2005). *Camponotus rufipes* establishes such interactions with different leafhoppers and treehoppers (Oliveira, 2025), but this type of interaction had not previously been recorded with *M. anjosi*.

Polybia platycephala also has a generalist diet, as in addition to preying on insects from different orders, such as coleopterans, dipterans, hemipterans, hymenopterans, lepidopterans, and odonates (Prezoto et al., 2005; Oliveira et al., 2024), it also feeds on fruit pulp (Souza et al., 2013; Barbosa, Paschoalini & Prezoto., 2014; Renne, Costa, Jacques & Souza, 2024) and pollen (Hermes & Köhler, 2006).

Although it is not possible to determine precisely the motivation behind *P. platycephala*'s attempts to access *M. anjosi* nymphs, the behavior indicates a potential interaction between social wasps and this psyllid. Furthermore, the unsuccessful attempts by *P. platycephala* to break through the white flocculent waxy secretions do not imply that other social wasps—especially those with larger body sizes—would also fail to do so. Thus, this behavior should be further investigated.

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AUTHOR CONTRIBUTIONS

All authors participated in writing the manuscript. LTIB carried out the field observations. MMS performed the identification of the insects.

CONFLICTS OF INTEREST

Authors declare no conflicts of interest.

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