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Artículo Original

Predation of a caterpillar (Lepidoptera: Saturniidae) by wasp *polybia jurinei* de saussure, 1854 (hymenoptera: vespidae)

Depredación de una oruga (Lepidoptera: saturniidae) por la avispa *polybia jurinei* de saussure, 1854 (Hymenoptera: Vespidae)

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ABSTRACT
The purpose of this work is the predation of a caterpillar (Lepidoptera: Saturniidae) by wasp *Polybia jurinei* de Saussure, 1854 (Hymenoptera: Vespidae). Social wasps provide important ecosystem services, such as trophic regulation and biological control of agricultural pests, including Lepidoptera larvae. However, there is limited information regarding the diet and feeding behavior of some species, such as *Polybia jurinei* de Saussure. Thus, the aim of this study to document the predation of a caterpillar (Lepidoptera: Saturniidae) by this species of social wasp on a ruderal plant, *Crepis japonica* (L.) DC. |(Asteraceae) in the southern region of the state of Minas Gerais, Brazil. The observation was made occasionally in November 2024, and the predatory behavior was described. This study contributes to the understanding of the predatory behavior of this vespid, and future studies may determine the frequency and impact of *P. jurinei* predation on caterpillars.

Keywords: Ethology; polistinae; natural enemy; *crepis*.

RESUMEN
El propósito de este trabajo es la depredación de una oruga (Lepidoptera: Saturniidae) por la avispa *Polybia jurinei* de Saussure, 1854 (Hymenoptera: Vespidae). Las avispas sociales desempeñan importantes servicios ecosistémicos, como la regulación trófica y el control biológico de plagas agrícolas, incluidas las larvas de Lepidoptera. Sin embargo, hay poca información sobre la dieta y el comportamiento alimentario de algunas especies, como *Polybia jurinei* de Saussure. De esta manera, el objetivo de este estudio es documentar la depredación de una oruga (Lepidoptera: Saturniidae) por esta especie de avispa social sobre una planta ruderal, *Crepis japonica* (L.) DC. (Asteraceae), en el sur del estado de Minas Gerais. La observación se realizó de manera ocasional en noviembre de 2024 y se describió el comportamiento depredador. Este trabajo añade información sobre el comportamiento depredador de este véspido, y estudios futuros podrán indicar la frecuencia e impacto de la depredación de *P. jurinei* sobre orugas.

Palabras clave: Etología; polistinae; enemigo natural; *crepis*.

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Social wasps (Hymenoptera: Vespidae), due to their predatory and generalist behavior, can provide different ecosystem services, such as trophic regulation and biological control of different agricultural pests (Prezoto et al., 2019; Brock et al., 2021). Lepidoptera larvae are prey frequently present in the diet of different species of social wasps, including those of the genus *Polybia* Lepeletier 1836 (Vespidae: Polistinae) (Gobbi et al., 1984; Gobbi & Machado 1985a,b; Machado et al., 1988; Prezoto et al., 2005; Bichara-Filho et al., 2009; Picanço et al., 2010; López et al., 2013; Dejean et al., 2017; Brügger et al., 2019; Oliveira et al., 2023; Oliveira & Souza, 2023).

This genus is distributed throughout the Neotropical region, with 59 species, 51 of which are found in Brazilian territory (Somavilla et al., 2021). Although there is information regarding the diet of the genus, data for some species remain scarce, even for those with a wide geographic distribution in Brazil (Somavilla et al., 2021), recorded in different biomes (Souza et al., 2020a,b), such as *Polybia jurinei* de Saussure 1854. This highlights the importance of studies that contribute to the understanding of the ethology and diet of these insects.

Therefore, the present study aimed to record the predation of a caterpillar (Lepidoptera: Saturniidae) by *P. jurinei* on a ruderal plant, *Crepis japonica* (L.) DC. (Asteraceae), in the southern region of the state of Minas Gerais, Southeast Brazil.

The observation was made occasionally on November 2, 2024, around 10:00 AM, at the teaching farm of the Federal Institute of Southern Minas Gerais (IFSULDEMINAS), Inconfidentes Campus, in the municipality of Inconfidentes, located in the southern region of Minas Gerais. The observations took place in a human-altered area with buildings, plantations, and pig farming, adjacent to a fragment of semideciduous forest within the Atlantic Forest domain.

The predatory act was observed in two sessions of approximately 15 minutes each, using the ad libitum method (Del Claro, 2010), totaling 30 minutes of observation. Following this, the individuals were collected using an entomological net. The specimens were preserved in 70% alcohol and later prepared and dry-mounted in the zoology laboratory. The identification of the social wasp was carried out using the dichotomous keys of Richards (1978) and by comparison with the collection of the Biological Collection of Social Wasps (CBVS). The Lepidoptera specimen was identified through a photograph sent to MSc. Lucas Vieira from ESALQ, Piracicaba. Due to the physical condition of the prey, it was only possible to identify it at the family level.

At first, an individual of *P. jurinei* was spotted flying over the *C. japonica* plant, carrying fragments of a prey in its mandibles, probably heading toward its nest. After about 2 minutes, an individual of *P. jurinei* returned to the plant and landed on the abaxial surface of the *C. japonica* leaf, where the caterpillar was located, and began removing more portions of the prey's body, which was still alive (Figure 01). Then, *P. jurinei* took flight with a fragment of the caterpillar, at which point it was captured using an entomological net. No other individuals were observed preying on the caterpillar until the end of the observations.

Figure 1. Predation of *Polybia jurinei* on a Saturniidae caterpillar on a *Crepis japonica* plant in Southern Minas Gerais, Southeast Brazil. Sequence of prey manipulation. Source: the authors, 2025.

The observed behavior is typical of social wasps that hunt relatively large prey, which is cut into small fragments and transported to their colonies for the feeding of the offspring, as is often the case with Lepidoptera larvae (Brown et al., 2012; Dejean et al., 2017). However, it differs from some situations, such as when smaller adult insects are preyed upon, where the social wasp consumes the prey on-site (Oliveira and Souza, 2023), or larger adults, in which non-palatable appendages, e.g. locomotory parts and the head, are removed, and only the abdomen is mashed and transported (Crispim et al., 2023).

Caterpillars of the Saturniidae family can cause damage to various forest species, such as eucalyptus (Zanuncio, 1993) and rubber trees (Santos & Gonçalves, 2005). Their natural predators include birds and stink bugs (Favalesso et al., 2020), as well as social wasps (Prezoto et al., 2006; Bichara-Filho et al., 2009). Therefore, *P. jurinei* is a potential predator of these pests, although this still needs further investigation. On the other hand, since *C. japonica* is an exotic plant (Lorenzi, 2000), in this specific case, *P. jurinei* appears to be performing a role opposite to those typically played by social wasps, by hunting the natural predator of a species that does not belong to the Brazilian flora. The success of the establishment of exotic species is, among other factors, due to the absence of natural predators (Lake & Leishman, 2004; Parker & Gilbert, 2007; Rankin, 2021).

There is little information about the diet of *P. jurinei*, but it is known that this species preys on blowfly larvae (Gomes et al., 2009) in addition to feeding on plant-based materials, such as fruit pulp (e.g., mango and guava) (Barbosa et al., 2014; Renne et al., 2024) and pollen (Crestana, 1995). Therefore, due to its diverse diet, *P. jurinei* seems to behave as a generalist and opportunist in its search for food resources, much like other congeners (Michelutti et al., 2017).

Although this study provides one of the few records of *P. jurinei* predating Lepidoptera larvae, such prey is frequently found in the diet of wasps from this genus, such as *Polybia emaciata Lucas* 1879 (López et al., 2013), *Polybia fastidiosuscula* de Saussure 1854 (Brügger et al., 2019; Oliveira & Souza, 2023), *Polybia ignobilis* (Haliday) 1836 (Gobbi & Machado, 1985b; Picanço et al., 2010; Oliveira & Souza, 2023), *Polybia occidentalis* (Olivier) 1792 (Gobbi et al., 1984), *Polybia paulista* H. von Ihering 1896 (Gobbi & Machado, 1985a), *Polybia platycephala Richards* 1978 (Prezoto et al., 2005), *Polybia rejecta* (Fabricius) 1798 (Dejean et al., 2017), *Polybia scutellaris* (White) 1841 (Oliveira et al., 2023), and *Polybia sericea* (Olivier) 1792 (Machado et al., 1988; Bichara-Filho et al., 2009).

In conclusion, this study adds information about the predatory behavior of a social wasp species with a little-known diet. Future studies may indicate the frequency of Lepidoptera larvae in the diet of P. jurinei, as well as the feasibility of using this social wasp in biological control programs in crops where these pests are a problem.

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