

Occurrence of *Cteisa hirta* Solier, 1835 (Tenebrionidae, Alleculinae) in an abandoned nest of a social wasp (Vespidae: Polistinae)

*Ocorrência de Cteisa hirta Solier, 1835 (Tenebrionidae, Alleculinae)
em ninho abandonado de vespa social (Vespidae: Polistinae)*

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ABSTRACT

Abandoned nests of social wasps (Vespidae: Polistinae) are often occupied by other arthropods such as ants, spiders, termites, bees, and solitary wasps. However, there are no records of any species of Coleoptera occupying these structures. Therefore, this work aims to report the occurrence of a beetle in an abandoned nest of a social wasp. The presence of the beetle *Cteisa hirta* (Tenebrionidae, Alleculinae) was observed in a nest of the genus *Polistes*, at IFMG - Campus Bambuí on March 9, 2023. As only one nest was recorded with the presence of a beetle, it can be suggested that this occupation is casual, but further studies need to be carried out to confirm that the use of abandoned nests by Tenebrionidae, or another family of Coleoptera, is not frequent.

Keywords: Coleoptera; occupation; *Polistes*.

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RESUMO

Ninhos abandonados de vespas sociais (Vespidae: Polistinae) são frequentemente ocupados por outros artrópodes, tais como formigas, aranhas, cupins, abelhas e vespas solitárias. Porém não há registros de nenhuma espécie de Coleoptera ocupando essas estruturas. Portanto, o presente trabalho tem como objetivo relatar a ocorrência de um besouro em um ninho abandonado de uma vespa social. A presença do besouro *Cteisa hirta* (Tenebrionidae, Alleculinae) foi observada em ninho do gênero *Polistes*, no IFMG - Campus Bambuí, no dia 9 de março de 2023. Como foi registrado apenas um ninho com presença de besouro, pode-se sugerir que tal ocupação é casual, todavia mais estudos precisam ser realizados para confirmar que o uso de ninhos abandonados por Tenebrionidae, ou outra família de Coleoptera, não é frequente.

Palavras-chave: Coleoptera; ocupação; *Polistes*.

INTRODUCTION

Wasps of the Polistinae subfamily build nests that have a diverse architecture (RICHARDS & RICHARDS, 1951). Nests of the Epiponini tribe are generally larger and have a greater number of cells and combs, and in most genera of this tribe, the nests have a protective covering. The nests of the Polistini and Mischocyttarini tribes are, commonly, small nests, with a single comb, a few dozen cells and no casing (SOMAVILLA *et al.*, 2012).

These nests, commonly built from a mixture of saliva and cellulose, are resistant and offer protection against predators (WENZEL, 1998). Furthermore, they also form a mechanical barrier against bad weather, such as rain, due to the hydrophobic composition of the nest construction material (SCHMOLZ *et al.*, 2000).

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Due to these characteristics, nests, when abandoned, are often occupied by other arthropods, such as ants (SOUZA *et al.*, 2022), spiders (ARAÚJO & MARIA, 2008), termites (JACQUES *et al.*, 2023), bees and solitary wasps (PINTO, 2005; JACQUES *et al.*, 2022). However, there are no records of any species of Coleoptera occupying these structures. Therefore, this work aims to report the occurrence of a beetle in an abandoned nest of a social wasp.

MATERIAL AND METHODS

The recording occurred, by chance, during another study that aimed to collect nests of social wasps occupied by solitary wasps, at the Bambuí Campus of the Federal Institute of Education, Science and Technology of Minas Gerais (20°02'22.64"S; 46°00'19.40"W), Bambuí, Minas Gerais, Brazil. The campus has a total area of 328.76 hectares and around 40 thousand square meters of buildings (IFMG, 2023), in an anthropic but very diverse area, with a predominance of buildings and agricultural crops, in the Cerrado biome.

The nests were collected in different buildings at IFMG – *Campus Bambuí* on March 9, 2023. After collection, the nest cells were counted and then kept in plastic containers covered by a fabric structure, with ventilation, in an incubator at the type B.O.D. for approximately 40 days, at 25°C and 70% relative humidity (SOMAVILLA *et al.*, 2015), to determine the presence of any arthropods that were occupying the nest. The beetle found was sacrificed, measured using Leica model m205C stereomicroscope tools (7.8x–160.0x) with MC190 HD image capture system, preserved in 70% alcohol, and sent for identification to Dr. Fernando Z. Vaz de Mello and Ayr de Moura Bello from the Colecao Entomologica de Mato Grosso Eurides Furtado, at the Universidade Federal do Mato Grosso (UFMT), Cuiabá, MT. To identify the genus of Polistinae that would have produced the nest, we adopted the dichotomous key of Somavilla *et al.* (2012).

RESULTS AND DISCUSSION

Ten social wasp nests were collected, all without envelopes (protective covering). One nest of the collected nests (figure 1A), in a building on the *campus*, had 125 cells, 12 of which were closed with mud, and was identified as belonging to the genus *Polistes* Latreille, 1802, due to the size of the cells. In this nest, there was the presence of a male beetle *Cteisa hirta* Solier, 1835 (Tenebrionidae, Alleculinae) (figure 1B), with a size of 8.3 mm from the head to the elytral apex.



Figure 1 – Abandoned nest of *Polistes* (Vespidae: Polistinae) (A) collected with the presence of *Cteisa hirta* (Tenebrionidae, Alleculinae) (B). Source: primary.

There is little information about this species in the literature, but it is known that adults are frequently found on cotton flowers (MENDES, 1938) and their larvae are known as minor pests for the roots of this plant (HAMBLETON & SAUER, 1938). Adults are small, with an average length of 9mm (DRECHSEL *et al.*, 2014), able to hide in the nest cells of *Polistes* wasps. Insects from the Tenebrionidae family have a detritivorous habit, feeding on dead plants and animals, both in the adult and larval stages (BUTLER, 1949; WATT, 1974; FLORES, 1998), which may justify the presence of this beetle in the nest, feeding of dead pupae and larvae of social wasps.

Another factor that may explain the presence of the beetle in the nest is protection against predators, as the nests of these vespids can offer refuge due to their resistance (WENZEL, 1998). Furthermore, beetles from this family, during the day, take refuge from the heat under stones, wood and leaves (BUBENAS *et al.*, 2013), thus, due to the hydrophobic and thermal insulating nature offered by the nest, it possibly provides protection to the beetle against adverse weather conditions (SCHMOLZ *et al.*, 2000; HOZUMI *et al.*, 2005; HÖCHERL *et al.*, 2016).

There are records of tenebrionids colonizing anthills and termite mounds (MATTHEWS *et al.*, 2010). However, this is the first record of Tenebrionidae, and also of Coleoptera, occupying the nest of social wasps. As only one nest was recorded with the presence of a beetle, it can be suggested that this occupation is casual, but further studies need to be carried out to confirm that the use of abandoned nests by Tenebrionidae, or another family of Coleoptera, is not frequent.

Abandoned nests of social wasps are a resource exploited by several arthropods, and some of them are well documented. However, for Coleoptera new observations are needed to better understand this relationship. Furthermore, this report helps to better understand the ecology of *Cteisa hirta*, a species that is still little studied.

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