EntomoBrasilis
e-ISSN 1983-0572

Scientific Note

Occurrence of *Megaselia scalaris* Loew (Diptera: Phoridae) in *Mischocyttarus cassununga* Von Ihering (Hymenoptera: Vespidae: Polistinae) nests

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EntomoBrasilis 15: e995 (2022)

Abstract. Social wasp nests create an environment rich in resources, such as food and shelter, which consequently attract predators, parasites, and parasitoids. Parasitoids attacks can be one of the main causes of mortality among social wasps in the early stages of development. Therefore, the aim of this work is to report the occurrence of parasitoids in *Mischocyttarus cassununga* Von Ihering (Hymenoptera: Vespidae: Polistinae) nests, in an area of Cerrado, at the Federal Institute of Education, Science and Technology of Minas Gerais (IFMG) - Campus Bambuí, Brazil. There was an emergence of four parasitoids from two nests of *M. cassununga*, identified as *Megaselia scalaris* (Loew) (Diptera: Phoridae), the first record of this parasitoid in *M. cassununga* in a Cerrado area.

Keywords: Cerrado; parasitoid; social wasp.

Edited by:
Alberto Moreira Silva-Neto

Article History:
Received: 04.ii.2022
First Answer: 03.iii.2022
Accepted: 15.iii.2022
Published: 24.vi.2022

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Funding agencies:
Without funding declared

EntomoBrasilis Update Check

doi: 10.12741/ebrasilis.v15e.995

Social wasps belong to the order Hymenoptera, family Vespidae and subfamilies: Stenogastrinae, Vespinae, and Polistinae (Carpenter & Marques 2001), but only the last one is found in Brazil, with 21 genera and 361 species (Hermes *et al*. 2022). These insects are divided into two groups according to nesting behavior and nest structure. The nest of the independent foundation group, Polistini, and Mischocytarini tribes, is composed with a single comb without a protective envelope, fixed to the substrate by a peduncle, forming small colonies (Jeanne 1975). In addition, the swarming group, the Epiponini tribe, has a well-defined social organization, with larger nests and a protective envelope (Jeanne 1975).

The Mischocytarini tribe is distributed in the Neotropical region, with a single genus, *Mischocyttarus* de Saussure, with 134 species in Brazil (Carpenter & Marques 2001; Hermes *et al.* 2022), being very common in urban areas (Jacques *et al.* 2012).

Social wasp nests create a rich environment in resources, such as food and shelter, which consequently attract predators, parasites, and parasitoids (Wcislo 2000). Independent foundation species are more vulnerable, since the nests do not have envelope protection, and adult wasps spend less time protecting the colony, as they need to forage (Clouse 2001; Somavilla *et al*. 2015).

This work aims to report the occurrence of parasitoids in *Mischocyttarus cassununga* Von Ihering (Vespidae: Polistinae) nests, in an area of Cerrado, at the Federal Institute of Education, Science and Technology of Minas Gerais (IFMG) - Campus Bambuí, State of Minas Gerais, Brazil.

Nine *M. cassununga* nests were collected in different buildings at IFMG - *Campus* Bambuí. The adults were discarded and the nests were kept in plastic containers covered by a fabric structure, with ventilation, in a BOD-type incubator for approximately 40 days, at 25 °C and relative humidity of 70% (Somavilla *et al*. 2015). The parasitoids that emerged were photographed and identified by Dr. Brian V. Brown (Curator, Natural History Museum, Los Angeles, California, USA).

Four parasitoids emerged from two nests of *M. cassununga*, identified as *Megaselia scalaris* (Loew) (Diptera, Phoridae) (Figure 1). *M. scalaris* is a cosmopolitan insect, it is mainly a detritivore and can act as a facultative predator of immature hosts (Disney 2008). This fly has been reported in the nest of social wasps, *Mischocyttarus cerberus* (Ducke) (Giannotti 1998), *Protopolybia acutiscutis* (Cameron), *Polybia occidentalis* (Olivier) (London & Jeanne 1998), *Polybia simillima* (Smith) (Young 1984), and *Polybia jurinei* (Saussure), causing serious damage to colonies (Somavilla *et al*. 2015). In addition, in Brazil, it has already been reported in *M. cassununga* nests in Viçosa, Minas Gerais (Soares *et al*. 2006) and Ubatuba, São Paulo (Somavilla *et al*. 2015), areas of Atlantic Forest. Our work is the first record of *M. scalaris* in a nest of *M. cassununga* in Cerrado.

Figure 1. *Megaselia scalaris* Loew (Diptera: Phoridae), female, emerged from a nest of *Mischocyttarus cassununga* Von Ihering (Hymenoptera: Vespidae: Polistinae). Photo: Silveira, L. C. P. 2021.

There are reports of wasps of the *Mischocyttarus* genus reacting to the phorid attack. *Mischocyttarus parallelogrammus* Zikan reacted by lifting their wings, walking around, and checking the cells (Togni *et al*. 2014). In *Mischocyttarus cerberus styx* Richards, some females destroyed the walls of cells in which *M. scalaris* infestation occurred (Giannotti 1998). In addition, in a colony of *Mischocyttarus labiatus* Fabricius that was very devastated by a phorid attack, the dominant wasp simply cut the nest peduncle discarding it to build a new nest in the same location (Litte 1981).

Despite few studies, parasitoid attack may be one of the main causes of mortality among social wasps in the early stages of development (Somavilla *et al*. 2015). Therefore, more research on the relationship between parasitoids and social wasps is needed to better understand this relationship.

ACKNOWLEDGMENTS

We thank Dr. Brian V. Brown (Curator, Natural History Museum, Los Angeles, California, USA) for identifying the parasitoid fly.

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EntomoBrasilis e-ISSN 1983-0572