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Notes and Comments

First record of *Polybia scutellaris* (White, 1841), (Hymenoptera: Vespidae) predating on *Samea multiplicalis* (Guenée, 1854) (Lepidoptera: Pyralidae), an herbivore of *Salvinia* spp. (Salviniaceae)

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Species of the genus *Salvinia* Ség. (Salviniales: Salviniaceae) are aquatic weeds considered invasive in various parts of the world, causing ecological and economic damage (Coetzee and Hill, 2020). Several measures have been implemented to control these plants, such as chemical, mechanical, and biological control. Among these tactics, biological methods are the most successful (McFarland et al., 2004).

Samea multiplicalis (Guenée, 1854) (Lepidoptera: Pyralidae), a moth occurring from North America to Argentina, shows potential to control *Salvinia* spp. (Pelli et al., 2008). This lepidopteran, however, is predated by the fire ant species *Solenopsis invicta* Buren, 1972 (Hymenoptera: Formicidae) (Parys and Johnson, 2012) as well as parasitoid wasps (Newton and Sharkey, 2000). There is a lack of information on predation by other taxa, such as social wasps (Hymenoptera: Vespidae: Polistinae), which is important for a better understanding of trophic chains and successful application of biological methods to control *Salvinia* spp.

In view of the above, this study aimed to describe the first record of predation of *Samea multiplicalis* caterpillars by *Polybia scutellaris* (White, 1841) (Hymenoptera: Vespidae) on the plant *Salvinia auriculata* Aubl. (Salviniales: Salviniaceae).

The records are made in two days, on August 27 and September 3, 2022, between 14:00 and 17:00, totaling approximately 6 h of observation, by *ad libitum* sampling (Del Claro, 2010) with photographic evidence (Nikon D90) in a group of lagoons (21°07′36.46″S 44°13′40.78″W) on the banks of Rio Das Mortes in Santa Cruz de Minas, Minas Gerais, Brazil. Specimens of *P. scutellaris* were captured with entomological nets and sent to the Federal Institute of Education, Science, and Technology of Southern Minas Gerais, Brazil, where the taxonomist Prof. Marcos Magalhães de Souza carried out the identification. Specimens were deposited in the Social Wasp Biological Collection (CBVS). *Samea multiplicalis* was identified based on Center et al. (1982) and *Salvinia auriculata* based on Miranda and Schwartsburd (2019).

Ten acts of predation of *P. scutellaris* on *Samea multiplicalis* larvae were observed (Figure 1a, 1b), as well as a colony nesting on a shrub belonging to the family Fabaceae (Figure 1c) about 2 m from the place of observation of predation acts.

Predation behavior is described as follows: (i) adult specimens of *P. scutellaris*, 7 mm, fly over *Salvinia* plants; (ii) *P. scutellaris* adults land on *Salvinia* and begin to forage, moving through the ramets and projecting themselves into folded floating leaves in search of *Samea multiplicalis* larvae (Figure 1d); (iii) when successful in finding their prey, *P. scutellaris* adults capture the larvae with their mandibles (Figure 1e); (iv) shortly after, *P. scutellaris* adults take flight carrying the entire prey, probably toward the nest. It was not possible to determine which instars of *Samea multiplicalis* larvae were being preyed upon, but larval stages ranged in size from 5 to 11 mm.

The use of *Samea multiplicalis* larvae as a food resource by *P. scutellaris* may be an opportunistic behavior, suggesting that this vespid is a generalist predator, like other species that feed on different animal taxa (Detoni and Prezoto, 2021). Studies reporting the predation of *P. scutellaris* on lepidopterans have not described the predatory act or strategy used by the vespid but have provided information on its diet. The vespid is known to feed on *Tuta absoluta* (Meyrick, 1917) (Lepidoptera: Gelechiidae) (Picanço et al., 2011) and *Diaphania hyalinata* (Linnaeus, 1767) (Lepidoptera: Pyralidae) (Santana et al., 2012), as well as on dipterans (Herdina et al., 2016), reinforcing the hypothesis that *P. scutellaris* is a generalist species.

The predation behavior of *P. scutellaris* is similar to that reported for *Polybia ignobilis* (Haliday, 1836), which also carries its entire pray, the caterpillar *Ascia monuste orseis* (Latreille, 1819) (Lepidoptera: Pieridae), to the nest (Picanço et al., 2010). This behavior may be explained by the small size of the caterpillar, which is smaller than the social wasp. In general, large prey are torn into smaller fragments, which are then transported to the nest (Brown et al., 2012; Pinheiro et al., 2023).

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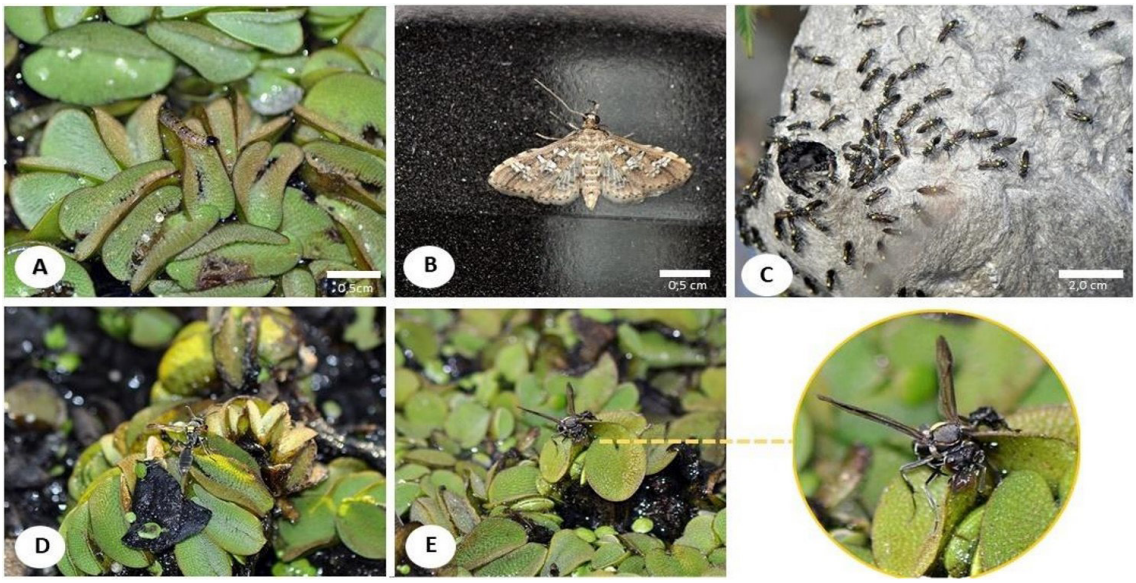

Figure 1. (A) Larva and (B) adult of *Samea multiplicalis* (Lepidoptera: Pyralidae), (C) colony of *P. scutellaris* (Hymenoptera: Vespidae), (D) adult of *P. scutellaris* foraging on *Salvinia auriculata* (Salviniales: Salviniaceae), and (E) adult of *P. scutellaris* predating on larvae of *S. multiplicalis*.

The sampled lagoons had a high density of *Salvinia auriculata* individuals, which formed an extensive carpet covering nearly the whole surface of the water body. Under these conditions, plants exhibit density-dependent phenotypic foliar plasticity, characterized by the production of large, folded, vertically oriented leaves (Coelho et al., 2000), which seem to provide shelter for *Samea multiplicalis* larvae. Nevertheless, *P. scutellaris* individuals were successful in locating and predating on larvae of *Samea multiplicalis*, penetrating into the leaves of *Salvinia auriculata* ramets. Similar foraging behavior was observed in other species of social wasps, which locate and predate their prey inside plant tissues (Bacci et al., 2019; Cabral et al., 2024).

The success of biological control of invasive aquatic plants can be negatively affected by the presence of predators of the natural enemies of these plants (Parys and Johnson, 2012). Thus, our unpublished record suggests that biological control of populations of *Salvinia* in tropical regions may be hindered by predators of natural enemies of these plants. The interaction between these organisms should be further investigated to better understand the impact on plant, herbivore, and predator populations, as we did not measure the density of the populations of these organisms.

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