

Presence of *Attacobius attarum* (Araneae, Corinnidae, Corinninae) in a Forest Fragment in Botucatu, SP, Brazil

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Abstract – The myrmecophily spider *Attacobius attarum* shows a phoretic behavior with leaf-cutting ant winged of genus *Atta* spp. But it is unclear whether these spiders are resident of the ants nests, and, they are synchronized to disperse when the nuptial flight of the sexual winged. To investigate whether *Attacobius attarum* spiders are outside the nests of leaf-cutting ants, pitfalls were installed on the surface of a forest fragment in Botucatu, SP, Brazil, where this species has been detected performing phoresy. Pitfalls were installed in the region, in an area of 400 m², spaced 5 of 5 meters, totaling 25 pitfalls. Forty four individuals were found in 10 families of spiders: Sicariidae, Ctenidae, Segestriidae, Corinnidae, Lycosidae, Salticidae, Amphinectidae, Amaurobiidae, Pholcidae and Philodromidae. The presence of *Attacobius attarum* was detected in forest fragment. In our study, the presence of spider (*Attacobius attarum*) suggest that they inhabit the litter and the soil surface, and disperse to the environment through phoresis on sexual winged of leaf-cutting ants. However, new studies should be performed addressed to investigate the natural history of these organisms.

Keywords – *Attacobius attarum*, Leaf-cutting Ants, Phoresy, Inquilines.

Attacobius attarum spider has a wide geographic distribution, extending from the Rio de Janeiro to Brasília, Brazil (Bonaldo & Brescovit, 2005). However, this species has an unusual natural history, with a phoretic behavior on the winged sexuals of *Atta* leaf-cutting ants during their nuptial flight (Mello-Leitão, 1923; Erthal & Tonhasca, 2001; Ichninose et al 2004, Bonaldo & Brescovit., 2005). But it is not known if these spiders are tenants of the ant nests, and are synchronized to disperse at the nuptial flight of winged sexuals.

This hypothesis is supported by observations of Erthal & Tonhasca, 2001, who state that *Attacobius* spider is a predator of immature forms inside the host's nest, *Atta sexdens*. On the other hand, no spider was found when queens were founding their nests, as well as inside of *Atta bisphaerica*, *Atta capiguara*, *Atta sexdens*, *Atta laevigata* initial nests (Ichninose et al. 2004). Surprisingly, it was found *Attacobius* sp. inside *Solenopsis saevissima* nests, with males and females (Fishing et al. 2011).

To investigate whether *Attacobius attarum* spiders are outside the nests of leaf-cutting ants, it were installed pitfalls on soil surface of a forest fragment in Botucatu, SP, Brazil. In this forest fragment, it was already detected *Attacobius attarum* performed phoretic dispersal in the environment attached with winged leaf-cutting ants. The

aim is to detect the presence of these spiders on the soil surface and not inside the nest, as suggested by the literature.

The experimental area was a forest fragment, with high abundance of *Eucalyptus*, located in Botucatu, SP, Brazil, with the presence of *Atta sexdens* nests. Pitfalls were installed on soil surface, in an area of 400 m², spaced 5 of 5 meters, totaling 25 pitfalls. Each pitfall consisted of plastic cup (300 ml), which was added 150 ml solution with water, detergent and glycerin (1:1:1).

The pitfalls remained on the field for five days, and the procedure was repeated 3 times, totaling 75 pitfalls installed. The content was transported to Insects Laboratory Social-Prague FCA / UNESP - Botucatu, where we proceeded to sorting and labeling of biological material collected. Spiders were sent to Dr. Brescovit the Butantan Institute, São Paulo, SP, for identification. The specimens were deposited in spider collection of the Instituto Butantan (Curator: Y. Cury).

Forty four individuals were found in 10 families of spiders: Sicariidae, Ctenidae, Segestriidae, Corinnidae, Lycosidae, Salticidae, Amphinectidae, Amaurobiidae, Pholcidae and Philodromidae. The presence of *Attacobius attarum* was detected in forest fragment. It was only found ten *Attacobius attarum* exemplary the forest fragment, who is immature (Table 1). Probably, *Attacobius* spider, at the time of the nuptial flight, approaches of leaf-cutting antnest. So, they climb onto the queen back and then attach to the pronotum region (Figure 1).

As expected, it was found *Attacobius attarum* the soil surface of the forest fragment in Botucatu. We found 10 families, being considered generalist predators of other organisms. Generally, the spiders have good characteristics as biological control agents, consume a lot of prey (insects) and do not have a negative effect cultivated plants (Nyffeler & Sunderland, 2003). They also have a cannibal behavior, intra-guild predation the same species and with other, as well as, other natural enemies (Snyder & Ires, 2003).

Attacobius attarum has a low frequency in the field observations, 10 individuals, showing that this species is outside of leaf-cutting ant nests, and unlikely, inside. Probably, low percentage *Attacobius attarum* in the forest fragment, is due to a higher frequency of other competitors, such as spiders of Lycosidae family (18%), Ctenidae (15%), Corinnidae, genus *Falconina* (12%), leading a competition and predation among them.

According to Erthal & Tonhasca (2001), *Attacobius* is a predator of immature forms inside the host's nest, *Atta sexdens*. This same genus was found inside the *Solenopsis saevissima* nest, with males and females (Fishing et al. 2011). But the spider's presence outside the nest supports the observations of Ichinose et al. (2004), who found no spider in the 100 initial nests excavated, suggesting that spiders jump in males and gynes in flight, and are dispersed by wind to colonize new habitat.

In our study, presence of spider (*Attacobius attarum*) suggests that they live in the leaf litter and the soil surface, and perform the dispersion in the environment by phoresis on winged of leaf-cutting ants. However, new studies should be addressed to investigate the natural history of *Attacobius attarum*.

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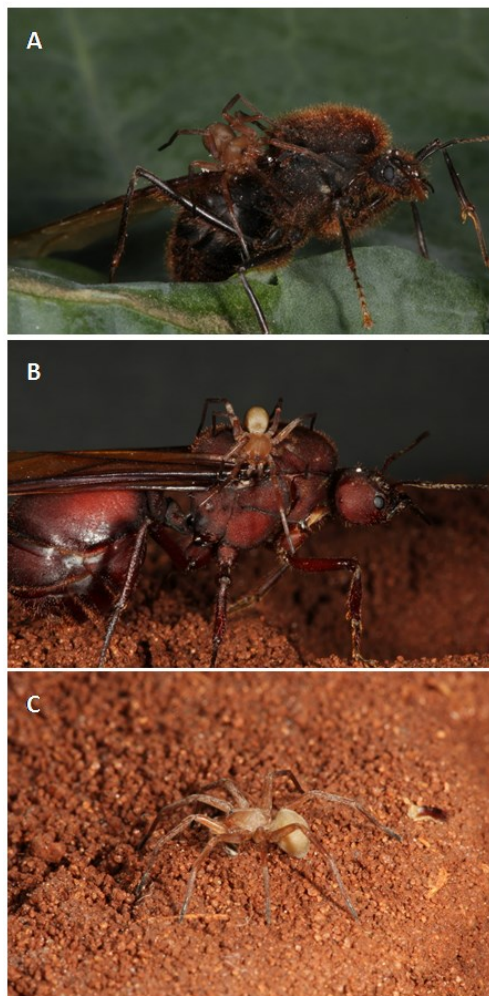


Fig. 1. Phoresy of *Attacobius attarum* in male (A) and female (B) of leaf-cutting ants, and under the loose soil mound in the nest (C).

Table 1. Number of spiders collected in pitfall in Botucatu, SP.

Family	Genus	Species	Male	Female	Immature	Exemplar
Bothriuridae	<i>Bothriurus</i>					1
Sicariidae	<i>Loxosceles</i>	<i>gaucho</i>		1		
Ctenidae	<i>Isoctenus</i>			1	1	
Ctenidae						5
Segestriidae	<i>Ariadna</i>			2		
Corinnidae	<i>Falconina</i>			3	1	
Lycosidae	<i>Trochosa</i>			1		
Salticidae	<i>Breda</i>				1	
Corinnidae						3
Corinnidae	<i>Abapeba</i>			1		
Corinnidae	<i>Castianeira</i>			1		
Amphinectidae	<i>Metaltella</i>			1		
Corinnidae	<i>Attacobius</i>	<i>attarum</i>				10
Amaurobiidae	<i>Ciniflrella</i>				1	
Pholcidae	<i>Ibotyporanga</i>	<i>naiadae</i>			1	
Salticidae	<i>Corythalia</i>			1		
Philodromidae						2
Lycosidae						6