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NOTA BREVE:

First record of egg sac predation of the wasp *Tromatobia* sp. Foster, 1869 (Hymenoptera: Ichneumonidae) upon *Araneus omnicolor* (Keyserling, 1893) (Araneae: Araneidae)

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First record of egg sac predation of the wasp *Tromatobia* sp. Foster, 1869 (Hymenoptera: Ichneumonidae) upon *Araneus omnicolor* (Keyserling, 1893) (Araneae: Araneidae)

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Abstract:
This work record the first interaction between the parasitoid wasp *Tromatobia* sp. (Ichneumonidae, Pimplinae) and its host *Araneus omnicolor* (Araneae: Araneidae), which was observed in the Serra do Japi, São Paulo, Brazil. In this interaction, the larvae of *Tromatobia* sp. are able to consume 100% of the egg mass of the host that remains suspended in the web of *Araneus omnicolor*.
Key words:*Polysphincta* genus-group, host, cocoon, egg sacs suspended, Brazil.

Primera cita de la depredación de *Tromatobia* sp. Foster, 1869 (Hymenoptera: Ichneumonidae) sobre la puesta de *Araneus omnicolor* (Keyserling, 1893) (Araneae: Araneidae)

Resumem:
Este trabajo es el primer registro de la interacción entre la avispa parasitoide *Tromatobia* sp. (Ichneumonidae, Pimplinae) y su hospedador *Araneus omnicolor* (Araneae: Araneidae), observada en la Serra do Japi, Sao Paulo, Brasil. En esta interacción,las larvas de *Tromatobia* sp.son capaces de consumir hasta el 100% de la masa de huevos del hospedador, la cual permanece suspendida en la tela de *Araneus omnicolor*.
Palabras clave: Grupo-género *Polysphincta*, hospedador, capullo, ovoteca suspendida, Brasil.

Introduction

Most spiders lay their eggs on complex structures formed by silk called egg sacs (Turnbull 1973), that may be occupied by hundreds of eggs (Turnbull 1973; Foelix 1996). This structure is used to protect eggs or spiderlings of thermal stress (Schaefer 1976; Hieber 1985), water loss (Foelix, 1996; Hieber, 1992a), attack by fungs (Christenson &Wenzl 1980), and parasites and predators (Austin, 1985; Hieber&Uetz, 1990; Hieber, 1992b; Foelix, 1996). However, sometimes this barrier can be broken and the eggs are exposed to attack of natural enemies (Austin, 1985; Auten, 1925). Several taxa of insects are specialized in using the egg sacs of spiders as resources (Auten, 1925; Eason et al., 1967; Austin, 1985). In most records, Ichneumonidae, Diptera, Mantispidae e Chalcidoidea behave as egg sac predators, requiring many eggs to complete their larval development or act as parasitoids with each larva using only a single egg to complete its development (Austin, 1985).

Species of wasp of the genus *Tromatobia* (Ichneumonidae) are known predators of egg sacs of the spider families Araneidae, Clubionidae, Philodromidae and Theridiidae (Nielsen, 1923; Austin, 1985; Jiménez, 1987). During oviposition, the female of *Tromatobia* can deposited of one to 14 eggs per egg sac (Nielsen, 1923). Little is known about the biology of the genus *Tromatobia*. Jiménez (1987) noted that the 6-9 individuals of *Troma-*

tobia blancoi Gauld, 1991, can develop in a single egg sac of spider host *Araneus thaddeus* (Hentz, 1847). Here we report the first case of parasitism of egg sacs of *Araneus omnicolor* by the wasp of the genus *Tromatobia* sp.

Material and methods

The egg sac of *A. omnicolor* constitutes of a leaf where the eggs are deposited. The leaf is folded and wrapped in silk and remain suspended in the three-dimensional web (Fig. 1a arrow). We found spider and egg sacs of *A. omnicolor* in webs built in Serra do Japi (23°15′S, 46°57′W), a protected subtropical humid forest located in Jundiai, state of São Paulo, Brazil. The spider webs containing the egg sacs were photographed in the field and the egg sacs were collected and maintained in plastic containers (30x25x25 cm) in the laboratory until wasps emergence.

Voucher specimens of *Tromatobia* sp. were deposited in the collection of Universidade Federal de São Carlos, São Carlos (curator A.M. Penteado-Dias) and specimens of *A. omnicolor* were deposited in Instituto Butantan, São Paulo (curator A.D. Brescovit).

Results and discussion

In totally it was collected 13 egg sacs of *A. omnicolor*, and these only one egg sac was parasitized by *Tromatobia* sp. Five male and two females (Fig 1d) of *Tromatobia* sp. emerged from egg sac and one pupa failed to develop (Fig. 1c, arrow). After the emergence of wasps the egg sac parasitized was dissected and no exuviae or spider was found, indicating that the larvae of *Tromatobia* sp. consumed the whole mass of the parasited egg sac. Cortés et al., (2000), after dissected a egg sac of *Araneus granadensis* (Keyserling, 1864) observed the presence of exuviae of spiders within the egg sac, concluding that *Tromatobia* sp. partially consumes the host´s eggs.

It was observed that after consuming the host eggs inside the egg sac, each larvae of *Tromatobia* sp. builds its own cocoon of silk (Fig.1c). The cocoons are positioned one beside the other occupying the entire internal portion of the egg sac (leaf) remained so until the outbreak. Adult wasps emerged made a small hole in the egg sac with the help of the mandibles (Fig.1b).

The suspension of the cocoon or nests reduce the contact with the substrate, being this a defensive behavior widely used within the animal kingdom (Zitani& Shaw 2002). Many species of spiders employ a strategy of suspending their egg sacs to avoid the attack of generalist predators (Turnbull, 1973), especially by ants that patrolling the vegetation (Hieber, 1992b). However, this strategy can make the eggs sacs evident for the attack of the flying insects or birds (Hieber, 1992b). Here, we report that this strategy sometimes can not be completely effective against attack of wasp of genus *Tromatobia*.

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References

AUSTIN, A. D. 1985.The function of spider egg sacs in relation to parasitoids and predators with special reference to the Australian fauna.*Journal of Natural History***43**: 2691–2699.

AUTEN, M. 1925. Insects associated with spider nests. *Annals of the Entomological Society of America*.**18**: 240-250.

CHRISTENSON, T. E. & P. A. WENZL. 1980. Egg laying of the Golden Silk Spider, *Nephila clavipes* L. (Araneae: Araneidae): functional analysis of the egg sac. *Animal Behaviour*.**28**: 1110-1118.

CORTÉS, J. P., E. F. DAZA & E. PALACIO. 2000. Registro de *Tromatobia*sp. (Hymenoptera: Ichneumonidae) como parasitoide de huevos de La araña *Araneus granadensis* (Araneae: Araneidae). *Folia Entomologica Mexicana*. **28**: 2-4.

EASON, R. R., W. B. PECK& W. H. WITCOM. 1967. Notes on spider parasites, including a reference list. *Journal of the Kansas Entomological So*ciety **40**: 422-434.

FOELIX, R. F. 1996.*Biology of spiders*. 2da. Ed. New York. Oxford University Press.

HIEBER, C. S. 1985. The "insulation" layer in the cocoons of *Argiopeaurantia* (Araneidae: Araneae).*Journal of Thermal Biology*.**10**: 171-175.

HIEBER, C. S. & G. W. UETZ. 1990. Colony size and parasitoid load in two species of colonial *Metepeira* spiders from Mexico (Araneae: Araneidae). *Oecologia*. **82**: 145-150.

HIEBER, C. S. 1992a.The role of spider cocoons in controlling desiccation. *Oecologia*. **89**: 442-448.

HIEBER, C. S. 1992b.Spider cocoons and their suspension systems as barriers to generalist and specialist predators. *Oecologia*.**91**: 530-535.

JIMÉNEZ, M. L. 1987. Relaciones biológicas entre arañas y avispas. *Folia Entomologica Mexicana*. **73**: 173-183.

NIELSEN, E. 1923. Contributions to the life history of the Pimpline spider parasites *Polysphincta*, *Zaglyptus*, *Tromatobia*) (Hym. Ichneum*). Entomology Meddeleiser*. **14**: 137–205.

SCHAEFER, M. 1976.An analysis of diapause and resistance in the egg stage of *Floronia bucculenta*(Araneae: Linyphiidae).*Oecologia***25**: 155-174.

TURNBULL, A. L. 1973. The ecology of the true spiders (Araneomorphae).*Annual Review of Entomology* **18**: 305-348.

ZITANI, N. M. & S. R. SHAW. 2002. From meteors to death stars: variations on a silk thread (Hymenoptera: Braconidae: Meteorinae). *American Entomologist***48**: 228-235.

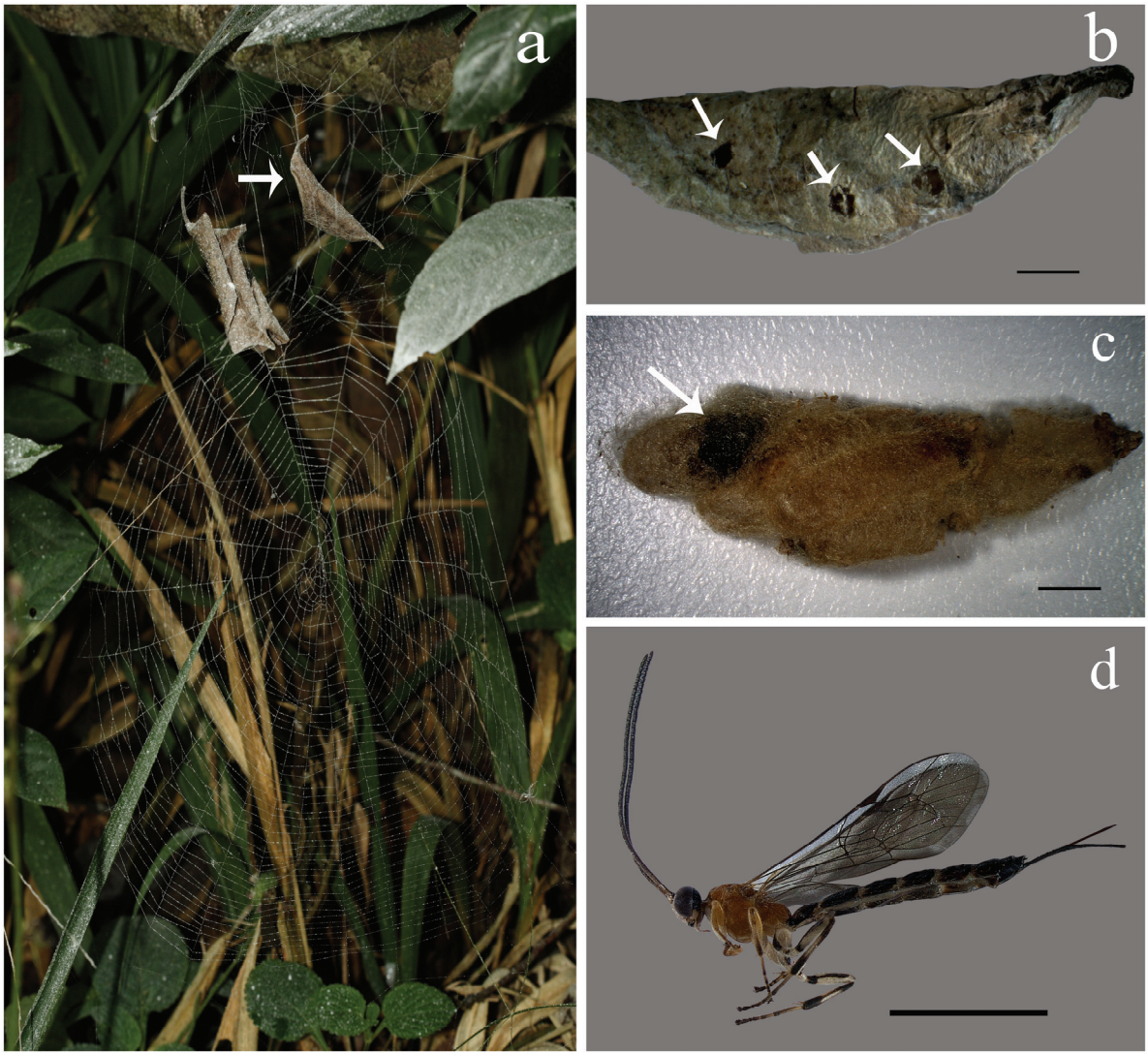

Figure 1. a), Web of *Araneus omnicolor* with egg sacs suspended in the web (arrow), b), holes made by the wasp to emerge from egg sac, c) Cocoon of *Tromatobia* sp. the arrow indicating a pupa that failed to develop, d) female of *Tromatobia* sp. that emerged of egg sac of spider. Scale bars: (b, d) 1 cm, (c) 4mm.