



Can Semaemyia sp. (Hymenoptera: Evaniidae) Function as a Parasitoid of the Spider Teudis sp. (Araneae: Anyphaenidae)?

Authors: Morales-Silva, Tiago, Pedroso, Beatriz Mariana, Carvalho, Leonardo Sousa, and Faria, Lucas Del Bianco

Source: Florida Entomologist, 101(2) : 342-344

Published By: Florida Entomological Society

URL: <https://doi.org/10.1653/024.101.0232>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Can *Semaeomyia* sp. (Hymenoptera: Evaniidae) function as a parasitoid of the spider *Teudis* sp. (Araneae: Anyphaenidae)?

Tiago Morales-Silva^{1,*}, Beatriz Mariana Pedroso², Leonardo Sousa Carvalho^{3,4}, and Lucas Del Bianco Faria⁵

The family Evaniidae comprises 32 genera and about 600 described species (Deans et al. 2017), and are popularly known as ensign wasps, nightshade wasps, or hatchet wasps in English, or “vespas-bandeira” and “vespas-machadinha” in Portuguese. These parasitic wasps are recognized by the insertion of the metasoma in the upper part of the mesosoma (Huben 2006; Deans 2011). Although the available information on the biology of evaniids indicates that they are solitary endoparasitoids of cockroach egg capsules, the hosts and oviposition behavior for most evaniid species are still unknown (Deans 2011), especially for species from tropical regions (Huben 2006). Among the evaniid taxa, the genus *Semaeomyia* Bradley 1908 (Hymenoptera: Evaniidae) is distributed over the Neotropical region and consists of 38 described species. There is no available information regarding the hosts of these species (Huben 2006; Deans 2011; Deans et al. 2017).

Between Mar and Oct 2016, we collected 170 fruits of *Senegalia tenuifolia* (L.) (Fabaceae) at 2 sampling sites (‘Pond 1,’ 21.1228°S, 44.9780°W, and ‘Pond 2,’ 21.2341°S, 44.9764°W) within the campus of the Federal University of Lavras, at Lavras, Minas Gerais State, south-eastern Brazil. Monthly, at each area we collected 5 fruits that were immediately taken to the laboratory for dissection and inspection for insects. In addition, 5 other fruits were bagged with voile fabric. These bags were tied at the base of the pedicel, sealing the fruits within the bags and preventing the entry or exit of any arthropods. This procedure was performed to identify the arthropod community in the fruits on a monthly basis. The bagged fruits were kept in the trees until the end of the experiment. To remove the fruits, we used long stem pruning shears.

In Oct 2016, the bagged fruits were removed from the trees and taken to the laboratory, where the insects from the interior of the bags were collected. The seeds also were dissected to analyze their unemerged fauna (i.e., we excavated the unemerged individuals from inside and between the seeds). In 1 bag from the site ‘Pond 1,’ a spider assigned to the genus *Teudis* Pickard-Cambridge, 1896 (Araneae: Anyphaenidae: Anyphaeninae) was observed, with signs of abdominal rupture. The spider was an adult female and, based on the relevant taxonomic literature, it was identified to the genus level through the

examination of its genitalia (Brescovit 1997) (Fig. 1). The Neotropical genus *Teudis* has 27 described species, but it was never revised taxonomically, and many species were described more than 50 yr ago (World Spider Catalog 2017). The examined female was not recognized as 1 of the recently described or redescribed species (see Brescovit 1997) and, thus, it may represent an undescribed species. The spider is deposited at the spider collection from the Committee for Taxonomic Collections of the Federal University of Minas Gerais (Adalberto J. Santos, curator), at Belo Horizonte, Minas Gerais State, Brazil (voucher number UFMG 21353).

In the same bag, 1 specimen of the parasitoid *Semaeomyia* sp. (Hymenoptera: Evaniidae) was found (Fig. 2). No other insects were found in the fruit or in the bag, nor cockroach egg sacs from which the parasitoid could have emerged, suggesting that it likely parasitized the spider found within the bag. The parasitoid was sent to the Committee for Taxonomic Collections of the Federal University of Minas Gerais (UFMG; Fernando A. da Silveira, curator).

The arthropod system associated with *S. tenuifolia* fruits has been studied by L. D. B. Faria for approximately 7 yr. This fauna and its ecological interactions are well known from the following studies: Tuller (2013); Tuller et al. (2015); Maia (2016); Maia et al. (2017, 2018); and Silva et al. (2017). Spiders commonly are observed in these fruits, and probably feed on insects present in them, while cockroaches or egg capsules never were found, reinforcing the evidence of this new interaction.

This seems to be the first record of a host species for the genus *Semaeomyia* and the first record of an Evaniidae parasitizing a spider, because until now it was known only for parasitizing cockroach egg sacs. Direct natural history and host information are difficult to gather from Evaniidae, because they reproduce in cryptic hosts. Also, they are inconspicuous insects that spend most of their time wandering in dense vegetation (Deyrup & Atkinson 1993).

The Evaniidae remains a poorly studied wasp family (Deans 2011). This report may provide valuable insight into the natural history of this group, and we hope that it stimulates additional research with these intriguing animals.

¹Universidade Federal de Lavras, Programa de Pós-graduação em Entomologia, Lavras, Minas Gerais, 37200-000, Brazil; E-mail: tiagomorales.bio@hotmail.com (T. M. S.)

²Universidade Federal de Lavras, Graduada em Ciências Biológicas, Lavras, Minas Gerais, 37200-000, Brazil; E-mail: beatrizpedrosoo27@gmail.com (B. M. P.)

³Universidade Federal do Piauí, Campus Amílcar Ferreira Sobral – CAFS, Floriano, BR 343, KM 3.5, Bairro Meladão, Piauí, 64800-000, Brazil; E-mail: carvalho@ufpi.edu.br (L. S. C.)

⁴Universidade Federal de Minas Gerais, Programa de Pós-Graduação em Zoologia, Belo Horizonte, Minas Gerais, 64800-000, Brazil

⁵Universidade Federal de Lavras, Departamento de Biologia, Setor de Ecologia e Conservação, Lavras, Minas Gerais, 37200-000, Brazil; E-mail: lucasdbf@gmail.com (L. D. B. F.)

*Corresponding author; E-mail: tiagomorales.bio@hotmail.com

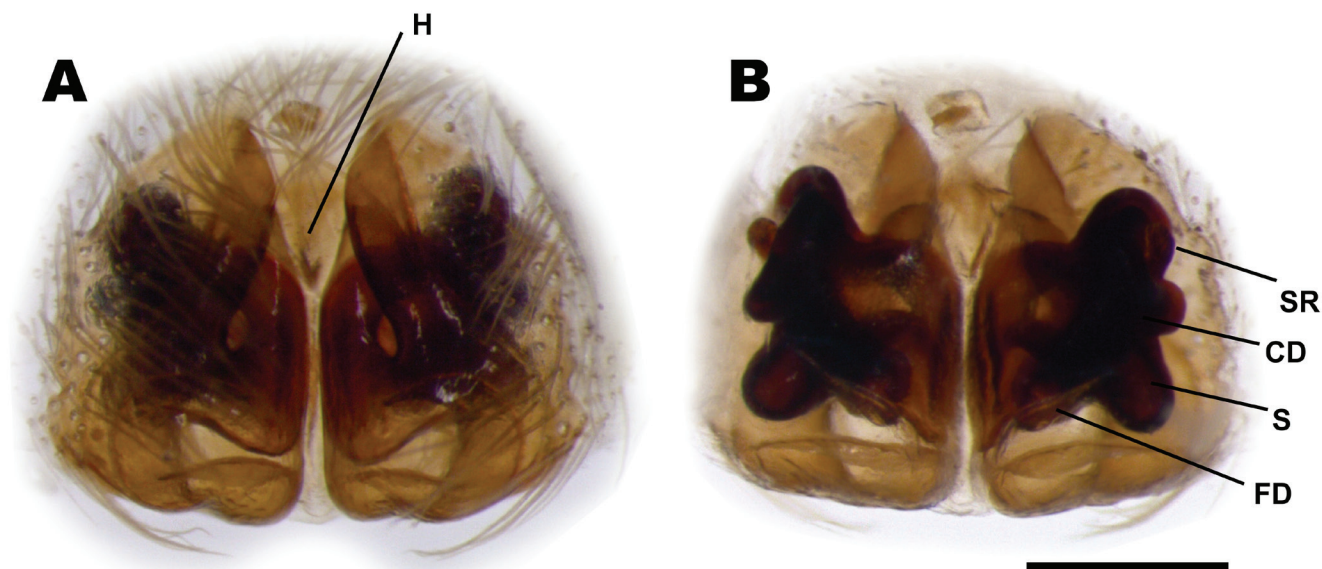


Fig. 1. *Teudis* sp. (Araneae: Anyphaenidae). (A) Female epigynum, ventral view. (B) Same, dorsal view. Abbreviations: CD, copulatory ducts; FD, fertilization ducts; H, hood; S, spermathecae; SR, seminal receptacles. Scale bar: 0.2 mm.

Authors would like to thank the Brazilian National Council for Scientific and Technological Development (CNPq) for the Master degree scholarship for T. Morales-Silva, and to the Minas Gerais Research Foundation (FAPEMIG) for the scientific initiation scholarship for B. M. Pedroso. We would also like to thank W. D. Ferreira and L. Oliveira for the assistance with the Evaniidae image. Author L. D. B. Faria thanks the Minas Gerais Research Foundation (FAPEMIG) and the Brazilian National Council for Scientific and Technological Development (CNPq) for financial support.

Summary

This study reports possible parasitism of the spider *Teudis* sp. Pickard-Cambridge (Araneae: Anyphaenidae) by the parasitoid *Semaomyia* sp. Bradley (Hymenoptera: Evaniidae) as a parasitoid. In Oct 2016,

we collected fruits of the *Senegalia tenuifolia* (Fabaceae: Mimosoideae) that previously were bagged with voile fabric, at the campus of the Federal University of Lavras, at Lavras, Minas Gerais, southeastern Brazil. In 1 of the fruits, we observed an anyphaenid spider, *Teudis* sp., from which an individual of *Semaomyia* sp. apparently had emerged. We suggest that this may be the first record of a host species for *Semaomyia* and the first parasitism record of spiders by the family Evaniidae, which is widely known to parasitize cockroach egg sacs. Additional research is needed on this poorly known group of parasitoids.

Key Words: ensign wasp; parasitism; *Senegalia tenuifolia*

Sumario

Este estudo relata um possível parasitismo da aranha *Teudis* sp. Pickard-Cambridge (Araneae, Anyphaenidae) pelo parasitoide *Semaomyia* sp. Bradley (Hymenoptera: Evaniidae). Em outubro de 2016 coletamos frutos de *Senegalia tenuifolia* (Fabaceae, Mimosoideae) que já haviam sido ensacados com tecido de voil, no campus da Universidade Federal de Lavras, em Lavras, Minas Gerais, no sudeste do Brasil. Em um dos frutos, observamos uma aranha Anyphaenidae *Teudis* sp., da qual aparentemente emergiu um indivíduo de *Semaomyia* sp. Nós sugerimos que este pode ser o primeiro registro de uma espécie hospedeira para representantes de *Semaomyia* e o primeiro registro de parasitismo de aranhas para a família Evaniidae, que é amplamente conhecida por parasitar ootecas de baratas. Pesquisas adicionais são necessárias para este grupo de parasitoides pouco conhecidos.

Palavras Chave: vespas-bandeira; parasitismo; *Senegalia tenuifolia*

References Cited

- Brescovit AD. 1997. Revisão de Anyphaeninae Bertkau a nível de gêneros na região Neotropical (Araneae, Anyphaenidae). *Revista Brasileira de Zoologia* 13: 1–187.
- Deans AR. 2011. Evaniidae of Cuba (Insecta: Hymenoptera). *Solenodon* 9: 55–65.
- Deans AR, Yoder MJ, Dole K. 2017. Evanioidea Online — catalog of information about evanioid wasps (Hymenoptera). <http://evanioidea.info> (last accessed 17 Jul 2017).



Fig. 2. *Semaomyia* sp. (Hymenoptera: Evaniidae). Scale bar: 500 μ m.

- Deyrup M, Atkinson TH. 1993. Survey of evaniid wasps (Hymenoptera: Evaniidae) and their cockroach hosts (Blattodea) in a natural Florida habitat. *Florida Entomologist* 76: 589–593.
- Huben M. 2006. Familia Evaniidae, pp. 223–227 In Hanson PE, Gauld ID [eds.], *Hymenoptera de la región Neotropical*. Memoirs of the American Entomological Institute, Gainesville, Florida, USA.
- Maia LF. 2016. Four year multitrophic food web: source food web description, methodology accuracy and species diversity. Dissertação de mestrado, Universidade Federal de Lavras, Lavras, Brazil.
- Maia LF, Tuller J, Faria LDB. 2017. Morphological traits of two seed-feeding beetle species and the relationship to resource traits. *Neotropical Entomology* 46: 36–44.
- Maia LF, Nascimento AR, Faria LDB. 2018. Four years host-parasitoid food web: testing sampling effort on trophic levels. *Studies on Neotropical Fauna and Environment*. DOI: 10.1080/01650521.2018.1428042
- Silva JA, Monteiro AB, Maia LF, Faria LDB. 2017. Morphological traits, allometric relationship and competition of two seed-feeding species of beetles in infested pods. *Revista Brasileira de Entomologia* 61: 243–247.
- Tuller J. 2013. Caracterização e efeito de cascata trófica em uma rede multi-trófica: de fatores abióticos do solo a insetos associados a frutos. Dissertação de mestrado, Universidade Federal de Lavras, Lavras, Brazil.
- Tuller J, Paula ELD, Maia LF, Moraes RA, Faria LDB. 2015. Seed predation food web, nutrient availability, and impact on the seed germination of *Senegalia tenuifolia* (Fabaceae). *Revista de Biología Tropical* 63: 1149–1159.
- World Spider Catalog. 2017. Natural History Museum Bern. <http://wsc.nmbe.ch>, version 16 (last accessed 9 Sep 2017).