

SHORT NOTE

First record of Mermithid nematodes parasitizing leafhoppers in South America

Primer registro de nematodos mermítidos parasitando chicharritas en Sudamérica

José Matías Rusconi¹* | Bárbara Soledad Defea² | Martín Miguel Montes³ | María Fernanda Achinelly⁴

- Received: 16/jul/2018
- Accepted: 8/apr/2019
- Published online: 26/agu/2019

Citation: Rusconi JM, Defea BS, Montes MM, Achinelly MF. 2020. First record of Mermithid nematodes parasitizing leafhoppers in South America. *Caldasia* 42(1):147-149. doi: <https://dx.doi.org/10.15446/caldasia.v42n1.73601>.

ABSTRACT

Nematodes of the family Mermithidae were found parasitizing adults and nymphs of the species *Hortensia similis* (Auchenorrhyncha: Cicadellidae). The host specimens were collected from weeds associated to citrus orchards located in Corrientes, Argentinean province, during a biodiversity study in 2015. As far as we know, this is the first South American example of leafhoppers parasitized by mermithids.

Keywords. Argentina, Hemiptera, Mermithidae, parasitism

RESUMEN

Se encontraron nematodos de la familia Mermithidae parasitando ninfas y adultos de *Hortensia similis* (Auchenorrhyncha: Cicadellidae). Los especímenes hospedadores fueron recolectados en malezas asociadas a huertos de cítricos ubicados en la provincia de Corrientes, Argentina, durante un estudio de biodiversidad en 2015. Hasta donde sabemos, este es el primer ejemplo de chicharritas parasitadas por un mermítido en Sudamérica.

Palabras clave. Argentina, Hemiptera, Mermithidae, parasitismo



Mermithids are obligate parasites of invertebrates, and most of them are parasites of insects (Poinar 1975, Poinar and Stockwell 1988, Poinar and Curčić 1992). Poinar (1975) found that most of the mermithid parasitisms in Hemiptera are probably accidental infections; however, high mortality levels due to infections of the genus *Hexameris* by mermithids were recorded in Asian delphacid pests (Auchenorrhyncha: Delphacidae) (Waloff and Jervis 1987). Helden (2008) cited the first extant nematode parasitizing adults of two other species of Auchenorrhyncha in Europe, the leafhopper *Macustus grisescens* (Zetterstedt 1828) (Cicadellidae), and the planthopper *Javesella dubia* (Kirschbaum, 1868) (Delphacidae). In North America mermithids have already been recorded parasitizing three species of Delphacidae and 26 species of Cicadellidae from Kentucky, USA (Sperka and Freytag 1975). In this work, we present the first example of mermithid infection in adults and larvae of Cicadellidae for South America.

Sampling was carried out at the Estación Experimental Agropecuaria, INTA Bella Vista (28° 28' 00" South - 59° 03' 00" West) located in Corrientes, Argentinean province during 2013–2015. Insect hosts were collected from weeds around a *Citrus sinensis* (L.) Osbeck orchard using an entomological sweep net. The collected specimens were preserved almost immediately in tubes with 70 % ethanol. Due to this preservation method, it has not been possible to identify the mermithids to species level, as they could not reach the adult stage.

Host species were identified based on Young (1977) and prepared following the technique proposed by Mejdalani (1998). The parasitized specimens were deposited in the Entomological Collection of Museo de La Plata, Buenos Aires, Argentina.

Adults and larvae of the species *Hortensia similis* (Hemiptera: Cicadellidae) were detected carrying mermithid nematodes (Fig. 1). The parasites were found partially

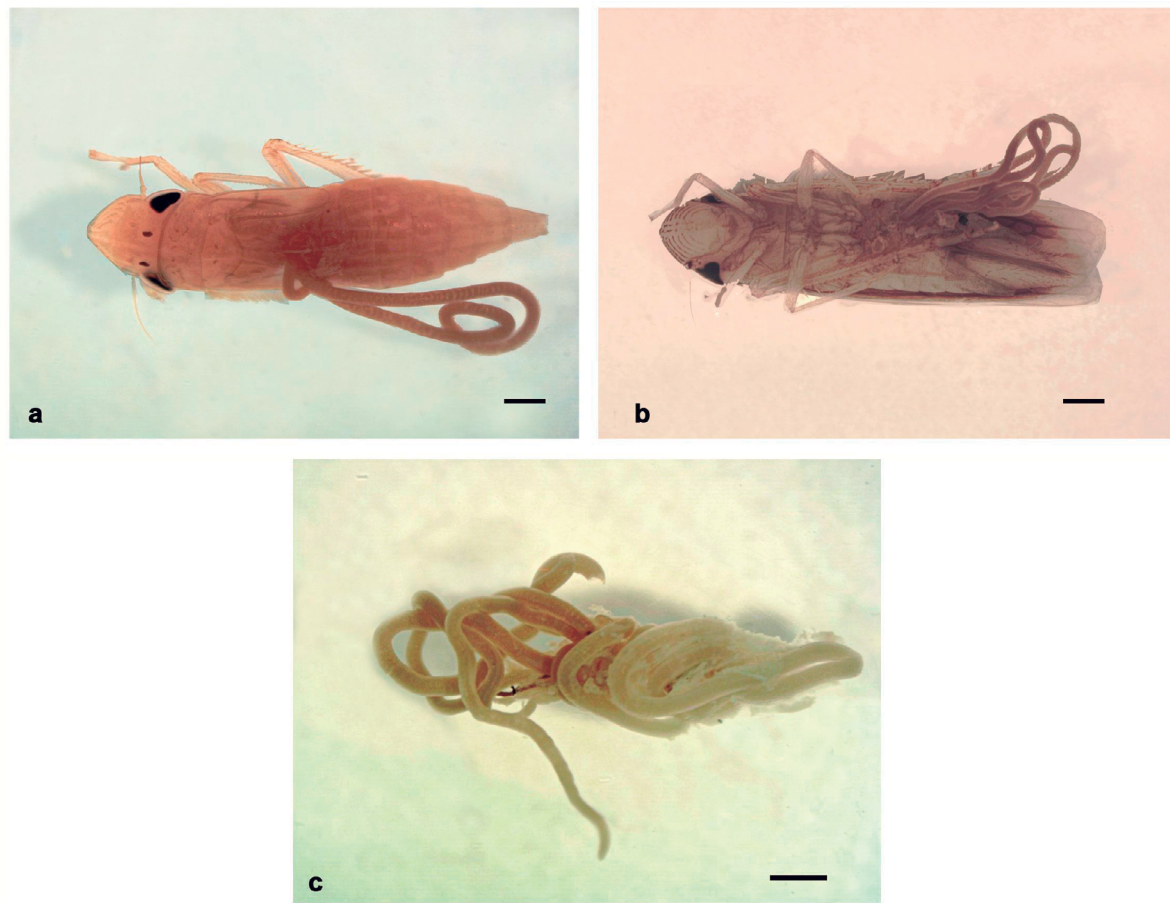


Figure 1. Different aspects of parasitism of *Hortensia similis* by a mermithid **a.** Nymph with a partially emerged mermithid; **b.** Adult with a partially emerged mermithid (ventral view); **c.** Post-parasitic juvenile manually removed from the host. Scale bar a and b: 3 mm, c: 5mm.

emerged from the host, mainly through the ventral side of the body (Fig. 1b). Of the 2133 captured specimens of *H. similis*, only six nymphs of fifth instar and one adult female presented parasitism. This low rate of parasitism (0.33 %), agrees with that presented by Sperka and Freytag (1975) who found a mermithid parasitism rate of only 0.3 % from 60 000 Auchenorrhyncha specimens collected. We believe that this low rate of parasitism is due to the vegetation physiognomy, along with the climatic and soil conditions (e.g. heavy rains, deluge) of the sampling site.

LITERATURE CITED

- Helden AJ. 2008. First extant record of mermithid nematode parasitism of Auchenorrhyncha in Europe. *J. Invertebr. Pathol.* 99(3):351–353. doi: <https://doi.org/10.1016/j.jip.2008.05.005>.
- Mejdalani G. 1998. Morfologia externa dos Cicadellinae (Homoptera, Cicadellidae); comparação entre *Versigonalia ruficauda* (Walker) (Cicadellini) e *Tretogonia cribrata* Melichar (Proconiini), com notas sobre outras espécies e análise da terminologia. *Rev. Bras. Zool.* 15(2):451–544. doi: <https://doi.org/10.1590/S0101-81751998000200015>.
- Poinar GO. 1975. Entomogenous nematodes: a manual and host list of insect–nematode associations. Leiden, Netherlands: E.J. Brill.
- Poinar GO, Stockwell, SA. 1988. A new record of a nematode parasite (Mermithidae) of a scorpion. *Rev. Nematol.* 11(3):361–364.
- Poinar GO, Ćurčić BMP, 1992. Parasitism of pseudoscorpions (Arachnida) by Mermithidae (Nematoda). *J. Arachnol.* 20(1):64–66.
- Sperka C, Freytag, PH. 1975. Auchenorrhyncha hosts of mermithid nematodes in Kentucky. *Trans. Ky. Acad. Sci.* 36:57–62.
- Waloff N, Jarvis MA. 1987. Communities of Parasitoids Associated with Leafhoppers and Planthoppers in Europe. *Adv. Ecol. Res.* 17:281–376. doi: [https://doi.org/10.1016/S0065-2504\(08\)60248-2](https://doi.org/10.1016/S0065-2504(08)60248-2).
- Young DA. 1977. Taxonomic study of the Cicadellinae (Homoptera: Cicadellidae): Part 2, New World Cicadellini and the genus *Cicadella*. Raleigh, N.C. Technical bulletin (North Carolina Agricultural Experiment Station), no. 239.

AUTHOR'S CONTRIBUTIONS

B.D. collected the samples; J.M.R and M.M. identified the parasites (Family); J.M.R, M.F.A, and B.D wrote the text.

CONFLICT OF INTEREST

The authors declare that they have not conflict of interest.

ACKNOWLEDGMENTS

The authors would like to thank Dr. Eliana Nieves for the photographs and to English professor Antonela Capurro for the revision of the manuscript.