Mermithid nematodes parasitizing leafhoppers for the first time in South America

Nematodos mermítidos parasitando chicharritas por primera vez en Sudamérica
Abstract

Nematodes of the family Mermithidae were found parasitizing adults and nymphs of the species *Hortensia similis* (Walker, 1851) (Auchenorroncha: 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 Southamerican example of leafhoppers parasitized by mermithids.

**Key words.** Mermithidae, Hemiptera, parasitism, Argentina.

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Resúmen

Se encontraron nematodos de la familia Mermithidae parasitando ninfas y adultos de *Hortensia similis* (Walker, 1851) (Auchenorroncha: 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.** Mermithidae, Hemiptera, parasitismo, Argentina.

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Mermithids are obligate parasites of invertebrates and most of them have been found to be parasites of insects (Poinar 1975, Poinar and Stockwell 1988, Poinar and Curčić, 1992). Poinar (1975) found that most of mermithid parasitisms in Hemiptera are probably accidental infections, however, high mortality levels due to infections of the genus *Hexamermis* (Steiner 1924) by mermithids were recorded in Asian delphacid pests (Auchenorroncha: 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, INTEA Bella Vista (28º 28’ 00” S - 59º 03’ 00” W) 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 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 emerged from the host, mainly from the ventral side of the body (Fig. 1b). Of the 2,133 captured specimens of *H. similis* only 6 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.

AUTHOR’S CONTRIBUTIONS

CONFLICT OF INTEREST

The authors declare that they have not conflict of interest.

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LITERATURE CITED


Figure 1. a. Nymph of Hortensia similis with a partially emerged mermithid. b. Adult of Hortensia similis 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.