Parapharyngodon sanjuanensis (Nematoda, Pharyngodonidae) in the lizard *Phymaturus extrilidus* (Iguania, Liolaemidae) from Puna region, Argentina

G. Ramallo, G. N. Castillo, J. C. Acosta

Ramallo, G., Castillo, G. N., Acosta, J. C., 2020. *Parapharyngodon sanjuanensis (Nematoda, Pharyngodonidae)* in the lizard *Phymaturus extrilidus* (Iguania, Liolaemidae) from Puna region, Argentina*. Arxius de Miscel·lània Zoològica*, 18: 85–88, Doi: https://doi.org/10.32800/amz.2020.18.0085

Abstract

Parapharyngodon sanjuanensis *(Nematoda, Pharyngodonidae) in the lizard* Phymaturus extrilidus *(Iguania, Liolaemidae) from Puna region, Argentina.* Studies about nematodes in lizards from Argentina are scarce. Here we report the finding in the province of San Juan, Argentina, of *Parapharyngodon sanjuanensis* from the large intestine of *Phymaturus extrilidus* (Squamata, Liolaemidae). This finding extends the geographical distribution and host range of this parasitic nematode.

Key words: Argentina, Lizard, Nematode, *Parapharyngodon sanjuanensis, Phymaturus extrilidus*, San Juan

Resumen

Parapharyngodon sanjuanensis *(Nematoda, Pharyngodonidae) en el lagarto* Phymaturus extrilidus *(Iguania, Liolaemidae) en la región de la Puna, Argentina.* Los estudios sobre nematodos en lagartos de Argentina son escasos. *Parapharyngodon sanjuanensis* se registró en el intestino grueso de *Phymaturus extrilidus* (Squamata, Liolaemidae) en la provincia de San Juan, Argentina. De esta forma, se amplían la distribución geográfica y el rango de hospedadores de este nematodo parásito.

Palabras claves: Argentina, Lagarto, Nematodo, *Parapharyngodon sanjuanensis, Phymaturus extrilidus*, San Juan

Resum

Parapharyngodon sanjuanensis *(Nematoda, Pharyngodonidae) en el llangardaix* Phymaturus extrilidus *(Iguania, Liolaemidae) a la regió de la Puna, Argentina.* Els estudis sobre nematodes en llangardaixos de l'Argentina són escassos. *Parapharyngodon sanjuanensis* es va registrar a l'intestí gros de *Phymaturus extrilidus* (Squamata, Liolaemidae) a la província de San Juan, Argentina. Així s'amplien la distribució geogràfica i el rang d'hostes d'aquest nematode paràsit.

Paraules clau: Argentina, Llangardaix, Nematode, *Parapharyngodon sanjuanensis, Phymaturus extrilidus*, San Juan

Received: 20/03/2020; Conditional acceptane: 07/07/20; Final acceptance: 08/07/20

Geraldine Ramallo, Instituto de Invertebrados, Fundación Miguel Lillo, Miguel Lillo 251, 4000 San Miguel de Tucumán, Argentina.– G. N. Castillo, J. C. Acosta, Gabinete de investigación DIBIOVA (Diversidad y Biología de Vertebrados del Árido), Departamento de Biología, Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de San Juan, Av. Ignacio de la Roza 590, 5402 San Juan, Argentina.

Corresponding author: G. N. Castillo: nataliocastillo@gmail.com

Introduction

Phymaturus Gravenhorst, 1838 comprises 38 species including two large clades, the *palluma* and the *patagonicus* groups (Lobo et al., 2013). Within this latter group, the Precordilleran lizard *Phymaturus extrilidus*, endemic to Sierras de las Invernadas (Wintering Mountain Range) (Lobo et al., 2012), occupies a restricted geographic range. This species is a habitat–use specialist, viviparous, and herbivorous (Laspiur and Acosta, 2012). According to the most recent classification of lizards and amphibians in Argentina, it is considered a vulnerable species (Abdala et al., 2012).

Pharyngodonidae include intestinal parasites of herbivorous, omnivorous and insectivorous lizards that are strictly monoxenous (Castillo et al., 2019). Thirteen species are assigned from the Neotropical region to the genus *Parapharyngodon* (Castillo and Acosta, 2019). To date, two species of *Parapharyngodon* nematodes have been found in *Phymaturus* lizards in Argentina; *Parapharyngodon riojensis* in *Phymaturus punae* Cei, Etheridge and Videla, 1985 from La Rioja Province (Ramallo et al*.,* 2002) and in *Phymaturus extrilidus* Lobo, Espinoza, Sanabria and Quiroga, 2012 from San Juan Province (Ramallo et al., 2017) and *Parapharyngodon sanjuanensis* in *Phymaturus punae* and *Phymaturus williamsi* Lobo, Laspiur and Acosta, 2013 from San Juan, respectively (Ramallo et al., 2016).

The purpose of this paper is to describe a new host of *P. sanjuanensis* in Argentina.

Materials and methods

The study area is the Don Carmelo Private Nature Reserve, Ullum Department (31º 10' S, 69º 46' W, 3,000 m a.s.l.), province of San Juan, Argentina (fig. 1). This area is representative of the Puna phytogeographic province, where the climate is cold and dry. The predominant vegetation is shrub steppe, with herbaceous plants and wetland systems (Cabrera, 1971). Samplings were performed in April 2014. One adult male specimen of *Phymaturus extrilidus* was captured (fig. 2) using the sliding noose technique. The specimen was sacrificed by administering intraperitoneal injections of a euthanasia solution, Euthanyle® (sodium pentobarbital), fixed in Bouin's solution for 24 h, labeled, and stored in 70 % ethyl alcohol. The studied specimen was deposited in the herpetological collection of the Biology Department of the School of Exact, Physical and Natural Sciences, National University of San Juan (UNSJ #2277). All applicable national and institutional guidelines for the care and use of animals were followed.

The captured lizard was dissected for extraction of nematodes through a longitudinal ventral incision from mouth to anus. The digestive tract was removed and examined with a stereoscopic binocular microscope. The nematodes were collected and stored in 70º ethanol. Nematode observation and identification was performed using the diaphanization by lactophenol technique. Nematodes were deposited in the Helminthological Collection Miguel Lillo Foundation (CH–FML # 07779), San Miguel de Tucumán, Argentina.

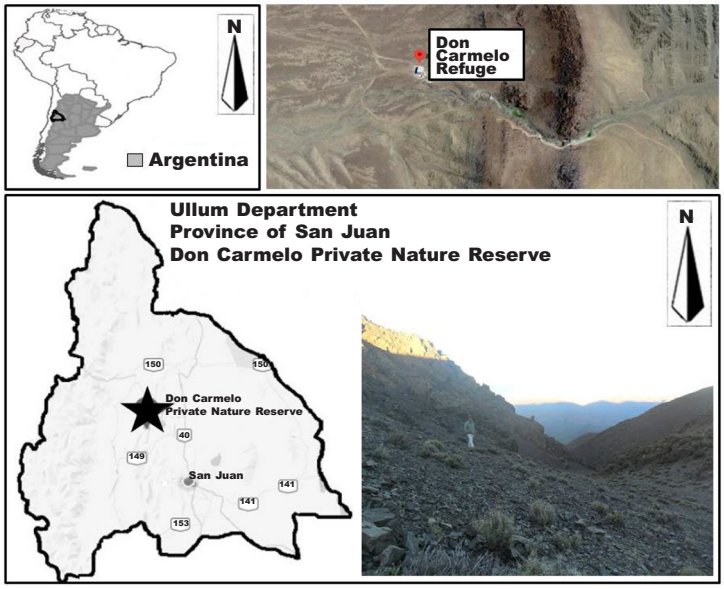

Fig. 1. Map showing the location of the study area.

Fig. 1. Mapa mostrando la localización del área de estudio.

Fig. 2. Specimen of *Phymaturus extrilidus*.

Fig. 2. Ejemplar de Phymaturus extrilidus.

Results and Discussion

Analysis of the gastrointestinal content in *P. extrilidus* (n = 1) revealed the presence of 28 adult nematodes (15 females, 13 males) in the large intestine. Nematodes were identified as *P. sanjuanensis* on the basis of the following characteristics: males possess 8 caudal papillae, 6 of which are large and pedunculate, and 2 are small, almost inconspicuous; anterior lip echinate, posterior lip bilobate; females possess prominent vulva and short stiff tail spike.

The present report expands the number of host species, representing a valuable contribution to parasitological knowledge in *P. extrilidus* and adding to knowledge of this species in cordilleran ecosystems.

Acknowledgements

We thank the Sub–Secretary of the Environment for the permits granted and Arturo Curatola for allowing us to carry out this research on Don Carmelo Private Reserve. The authors declare no competing interests.

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