

## RESEARCH NOTE/NOTA CIENTÍFICA

FIRST RECORD OF *HELIGMOSTRONGYLUS SEDECIMRADIATUS* LINSTOW, 1899 (RHABDITIDA: HELIGMONELLIDAE), IN BICOLOR-SPINED PORCUPINE *COENDOU BICOLOR* (TSCHUDI, 1844) (RODENTIA: ERETHIZONTIDAE) IN PERU

PRIMER REGISTRO DE *HELIGMOSTRONGYLUS SEDECIMRADIATUS* LINSTOW, 1899 (RHABDITIDA: HELIGMONELLIDAE), EN PUERCOESPÍN *COENDOU BICOLOR* (TSCHUDI, 1844) (RODENTIA: ERETHIZONTIDAE) EN PERÚ

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### ABSTRACT

The results of a helminthological examination performed on one specimen of bicolor-spined porcupine *Coendou bicolor* (Tschudi) from department of San Martín, Peru were reported. The endoparasite helminth found was *Heligmostrongylus sedecimradiatus* (Linstow, 1899) Travassos, 1917. The geographic distribution of *Heligmostrongylus sedecimradiatus* is extended from the original locality (Brazil) to Peruvian territory. Also, *C. bicolor* is a new host for *H. sedecimradiatus*.

**Keywords:** Amazon - *Coendou bicolor* - *Heligmostrongylus sedecimradiatus* - Nematoda - Peru.

### RESUMEN

Se presentan los resultados de un examen helmintológico realizado en un espécimen de puercoespín *Coendou bicolor* (Tschudi, 1844), del departamento de San Martín, Perú. El helminto endoparásito encontrado fue *Heligmostrongylus sedecimradiatus* (Linstow, 1899) Travassos, 1917. La distribución geográfica de *Heligmostrongylus sedecimradiatus* fue ampliada de su lugar de origen (Brasil) al territorio peruano. Además, *C. bicolor* es un nuevo huésped para *H. sedecimradiatus*.

**Palabras claves:** Amazonia - *Coendou bicolor* - *Heligmostrongylus sedecimradiatus* - Nematoda - Perú.

## INTRODUCTION

*Coendou bicolor* (Tschudi, 1844) is a rodent species of the family Erethizontidae that is distributed across Argentina, Bolivia, Brazil, Colombia and Peru (Voss & Silva, 2001; Voss, 2011; Freitas *et al.*, 2013; Voss *et al.*, 2013). This species is listed as a least concern by International Union for Conservation of Nature and Natural Resources (IUCN Red List) (Dunnun & Delgado, 2008), although, its current population trend in the wild is decreasing (Hurtado & Pacheco, 2015). In Peru, information in relation to the parasitic fauna of *C. bicolor* is lacking.

In this paper, we present the first record of a Heligmonellidae species *Heligmostrongylus sedecimradiatus* (Linstow, 1899) Travassos, 1917 in bicolor-spined porcupine from Peru.

## MATERIAL AND METHODS

In May 2015, a specimen of *C. bicolor* was found dead in the forest of Tarapoto, San Martin, Peru. The specimens were collected and taken to the Laboratory of Clinical Analysis Moraleslab for the necropsy. The host was identified according to Voss (2011). The scientific and valid name of the host follows to Patton *et al.* (2015). Nematodes were collected from the gastrointestinal tract, placed in petri dishes with saline, fixed in hot formaldehyde (4%) and preserved in ethanol (70%). For morphological study, the nematodes were clarified in a mixture alcohol-phenol. The nematode adults were analyzed and measured using the computerized system for image analysis Qwin Lite 3.1 (Leica). Measurements were made in millimeters (mm). The taxonomic determination of the parasites was in accordance with the diagnosis proposed by Travassos (1921) and Vicente *et al.* (1997). Voucher specimens of *H. sedecimradiatus*

were deposited in the Coleção Helminológica do Instituto de Biociências (CHIBB 7808), UNESP, municipality of Botucatu, São Paulo State, Brazil; in Helminthological Collection and Related Invertebrates of the Museum of Natural History at the San Marcos University (MUSM 3257), Peru and in Scientific Collection of Protozoa and Metazoan Parasites of the Federico Villarreal University (CPMP 162), Peru.

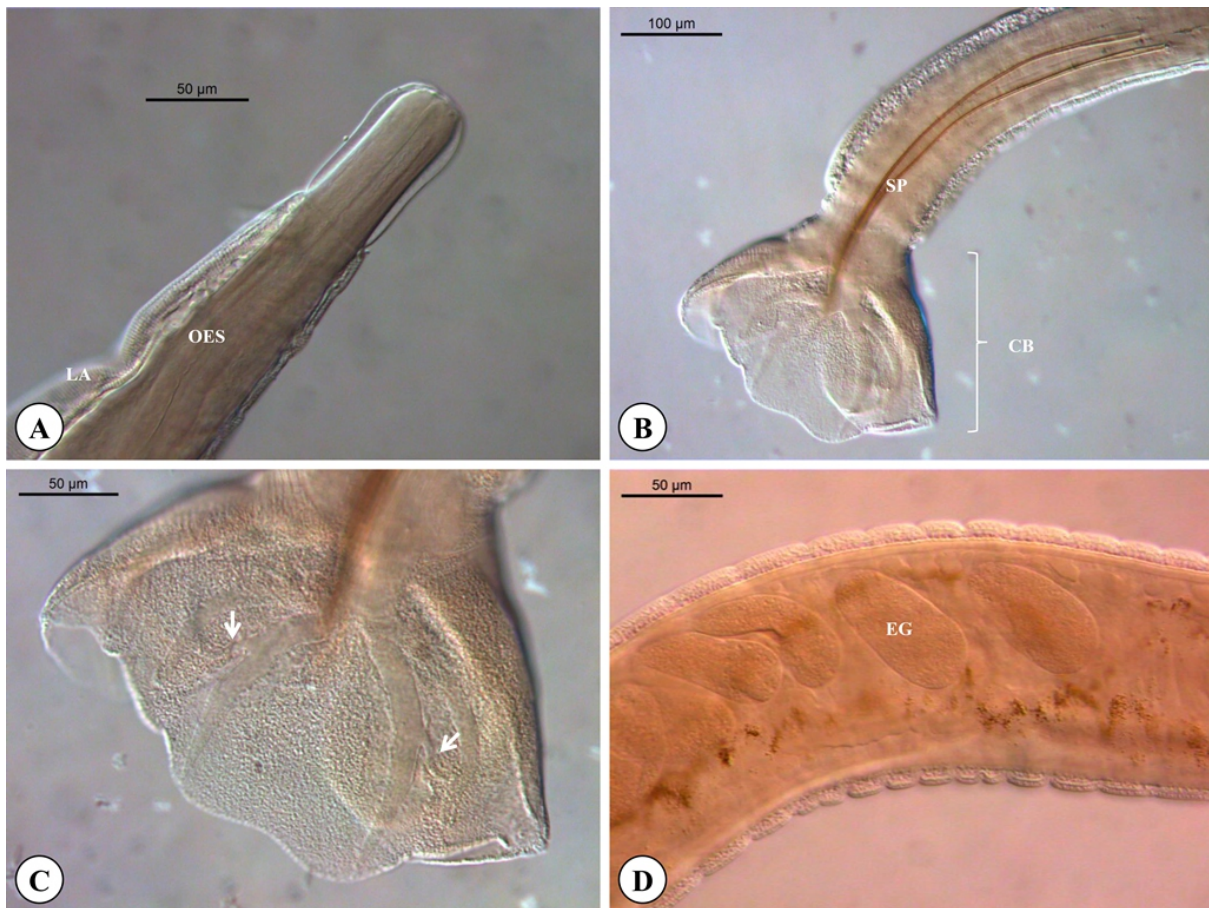
## RESULTS

*Heligmostrongylus sedecimradiatus* has a filiform body, not spiral. Cuticle with fine transverse striations and well-marked longitudinal striations. Dorsal is elongated, extending almost to the posterior end. Males with long and delicate spicules, and gubernaculum complex. Females with long cauda in younger and obtuse in the older specimens.

The following measurements were made on the specimens of *H. sedecimradiatus* (Figs. 1A – D), collected of small intestine from *C. bicolor*:

Female (based on five specimens measured). Body 8.88 – 17.64 (11.66) mm long, with a maximum width of 0.15 – 0.21 (0.18) mm. Cuticular cephalic dilatation 0.07 – 0.09 (0.08) mm. Esophagus 0.52 – 0.90 (0.66) mm long. Distance of the vulva to the posterior end 0.31 – 0.75 (0.51) mm. Distance of the anus to the posterior end 0.30 – 0.52 (0.41) mm. Eggs 0.079 x 0.037 mm (Fig. 1D).

Male (based on five specimens measured) (Figs. 1A,B,C). Body 5.62 – 7.90 (7.14) mm long, 0.15 – 0.17 (0.16) mm of maximum width. Cuticular cephalic dilatation 0.06 – 0.08 (0.07) mm. Oesophagus 0.45 – 0.63 (0.52). Spicules 0.50 – 0.57 (0.53) mm. Copulatory bursa symmetrical with dorsal radio with small external branches (Figure 1).



**Figure 1.** *Heligmostrongylus sedecimradiatus* in *Coendou bicolor* from Peru. A. Anterior extremity of male. B. Posterior extremity of male. C. Copulatory bursa symmetrical with dorsal radio with small external branches (arrows). D. Eggs. OES = Oesophagus. LA = lateral alae. SP = spicules. CB = Copulatory bursa. EG = Egg.

## DISCUSSION

In Peru, there is only one report on the occurrence of *Heligmostrongylus* spp. infecting mammals. Sarmiento *et al.* (1999) found *Heligmostrongylus* sp. in small intestine of Steere's spiny rat, *Proechimys steerei* Goldman, 1911 (Echimyidae). According to Vicente *et al.* (1997), Thi *et al.* (2012) and Costa *et al.* (2013), *H. sedecimradiatus* is already found parasitizing five hosts, as follow: Bahia Hairy Dwarf Porcupine, *Coendou insidiosus* (Olfer 1818) (Erethizontidae), agouti, *Dasyprocta aguti* Linnaeus, 1766 (Dasyproctidae), brown rat

*Rattus norvegicus* (Muridae), red-rumped agouti *Dasyprocta leporina* (Linnaeus, 1758) (Dasyproctidae) and spotted paca, *Cuniculus paca* (Cuniculidae) in Brazil, Colombia and Vietnam (Patton *et al.*, 2015).

Measurements of male and female specimens of *H. sedecimradiatus* registered by Travassos (1921) are similar to current specimens. Only male length is smaller in comparison to the material of Travassos (1921).

The occurrence of *H. sedecimradiatus* parasitizing *C. bicolor* is the first report of this nematode in Peruvian territory, as well as a new host for this nematode parasite.

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