

Rhabdochona ictaluri sp. nov. (Nematoda, Rhabdochonidae) from ictalurid catfishes in Mexico

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Abstract

A new species of *Rhabdochona* is described as a parasite of two endemic species of catfishes (*Ictalurus dugesii* and *Ictalurus pricei*) from two river basins in central and northern Mexico (Río Ameca and Río Tunal). *Rhabdochona ictaluri* sp. nov. is characterized by a combination of morphological traits that include the presence of basal teeth, bifurcated deirids, absence of a dorsal barb in left spicule and length ratio between spicules. The combination of these traits readily distinguishes the new species from all its congeners, including those species possessing 14 teeth in the prostom. The new species appears to be specific to freshwater ictalurids.

Keywords

Nematoda, *Rhabdochona ictaluri* sp. nov., catfishes, *Ictalurus pricei*, *I. dugesii*, Mexico

Introduction

Members of Rhabdochonidae are frequently found parasitizing numerous species of freshwater fishes all over the world. Several species of *Rhabdochona* Railliet, 1916 have been recorded as parasites of a wide array of freshwater fish families in the Americas (Moravec 1998, Hoffman 1999, Mejía-Madrid *et al.* 2007). Of these, eleven species have been found in freshwater fishes of Mexico (Caspeta-Mandujano 2005, Garrido-Olvera *et al.* 2006, Pérez-Ponce de León *et al.* 2009). As a part of a study addressed to survey the helminth parasite fauna of freshwater fishes in arid regions of Mexico, specimens of a hitherto unknown species of *Rhabdochona* were recovered from the anterior and middle regions of the intestine of two catfish species of the family Ictaluridae (Siluriformes), the Yaqui catfish, *Ictalurus pricei* (Rutter), and the Lerma catfish, *Ictalurus dugesii* (Bean); this new species is described herein.

Materials and methods

In July 2005 and November 2007, several catfishes were collected with gillnets in localities along the Mezquital and Ameca rivers in Durango and Nayarit states. The nematodes were recovered alive from the intestine of their hosts. After recovery, worms were killed and fixed in hot 4% formaldehyde or 70% alcohol. In the laboratory they were cleared with

glycerine for examination. Drawings were made with the aid of a drawing tube. All measurements of the description are given in millimeters. Some specimens were processed for scanning electron microscopy (SEM). Type specimens and paratypes were deposited at the Colección Nacional de Helmintos (CNHE), Instituto de Biología, UNAM, Mexico City.

Results

Rhabdochona ictaluri sp. nov. (Figs 1 and 2)

Description: Relatively small nematodes with smooth cuticle. Oval mouth surrounded by four minute cephalic papillae and 2 lateral amphids. Funnel shaped prostom possessing 6 basal teeth; anterior margin of prostom armed internally with 14 teeth (3 dorsal, 3 ventral, and 4 on each lateral side, the later arranged in pairs) (Figs 2a, b). Vestibule relatively long. Small bifurcated deirids (Fig. 2e), situated in the first third of vestibular region. Tail of both sexes conical, ending in sharp cuticular spike.

Male (based on 5 specimens): Length of body 6.374–6.857, maximum width 0.105–0.12. Prostom 0.018–0.021 long, 0.01–0.012 wide. Length of vestibule including prostom 0.094–0.101; muscular oesophagus 0.185–0.21; glandular oe-

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sophagus 1.796–2.142. Nerve ring encircling muscular oesophagus 0.142–0.159 from anterior end of body. Deirids 0.079–0.086 from the anterior end of body. Preanal papillae occurring in the following combinations: 8 + 7, 8 + 9, and 9 + 9 (number of papillae on right and left sides, respectively). Additional pair of preanal papillae at level of the third subventral pair (counting from the anal opening). Six pairs of

postanal papillae present, second pair lateral, remaining pairs subventral. Area rugosa present. Left spicule 0.445–0.544 long, length of shaft 0.190–0.206, representing 37.8–42.7% of spicule length, distal tip broad, with small bifurcation covered with narrow membrane. Right spicule 0.072–0.092 long, without dorsal barb at distal tip. Length ratio of spicules 1:5.5–1:7.2. Tail conical with terminal cuticular spike.

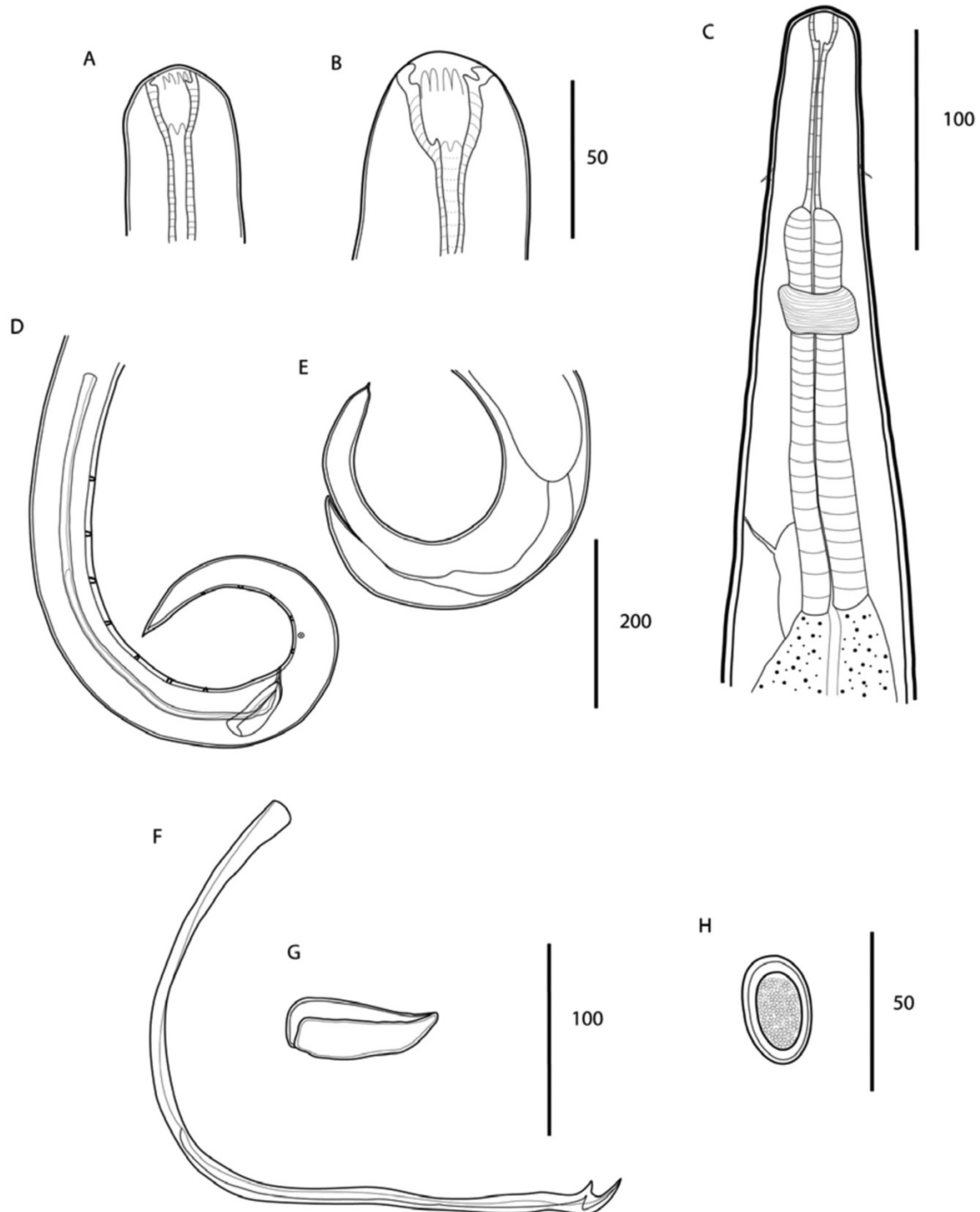


Fig. 1. *Rhabdochona ictaluri* sp. nov.: **A, B** – anterior end of male, lateral and ventral view; **C** – anterior end of female; **D** – posterior end of male, lateral view; **E** – posterior end of female, lateral view; **F** – left spicule; **G** – right spicule; **H** – egg

Female (based on 3 specimens): Body length 9.782–13.564, maximum width 0.137–0.175. Prostom 0.024–0.025 long, 0.012–0.013 wide. Length of vestibule including prostom 0.093–0.103, muscular oesophagus 0.26–0.278, glandular oesophagus 2.426–2.64. Nerve ring encircling muscular oesophagus 0.161–0.186 from anterior end of body. Deirids 0.073–0.079 from the anterior end of body. Tail conical with terminal cuticular spike. Vulva at 5.845–7.535 from anterior end of body. Muscular vagina directed anteriorly from vulva.

Uterus amphidelphic, anterior ovary reaching posterior end of oesophagus, posterior ovary not far from rectum. Immature eggs oval, without filaments; 0.011–0.012 long, 0.07–0.08 wide.

Type host: *Ictalurus pricei* (Rutter) (Yaqui catfish).

Other host: *Ictalurus dugesii* (Bean) (Lerma catfish).

Site of infection: Anterior and middle intestine.

Type locality: Río Tunal at Nombre de Dios, Durango, Mexico (23°34'45.1"N, 103°51'23.7"E).

Prevalence: 16%.

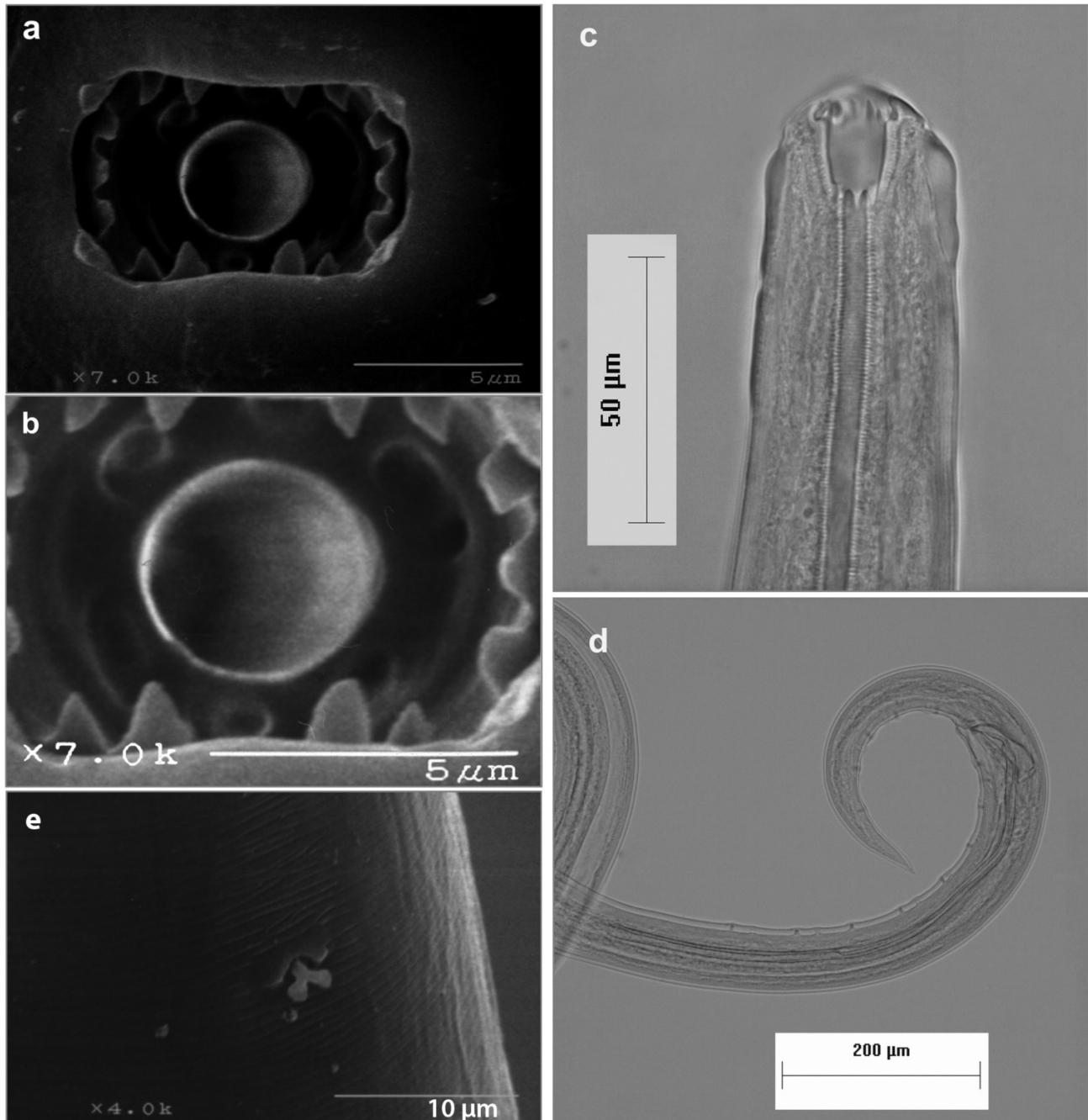


Fig. 2. *Rhabdochona ictaluri* sp. nov., scanning electron micrographs; a, b – cephalic end of male, apical view; c – anterior end of female; d – posterior end of male; e – deirid

Deposition of type material: Holotype, CNHE 6549; allotype, CNHE 6550; paratypes, CNHE 6551; paratype (SEM) 6552.

Another locality: Río Ameca at San Blasito, Nayarit, Mexico (23°34'45.1"N, 103°51'23.7"E). These specimens were recorded as *Rhabdochona* sp. from San Blasito, Nayarit (Rosas-Valdez and Pérez-Ponce de León 2008), and deposited at the CNHE (CNHE 5962).

Prevalence: 23%.

Etymology: This species is named after the generic name of the hosts.

Remarks: Eleven species of *Rhabdochona* described from the Americas possess 14 teeth in the upper prostom: *R. acuminata* (Molin, 1860); *R. californiensis* Maggenti, Abdel-Rahman et Cid del Prado Vera, 1992; *R. canadensis* Moravec et Arai, 1971; *R. cascadilla* Wigdor, 1918; *R. catostomi* Kayton, Kritsky et Tobias, 1979; *R. cotti* Gustafson, 1949; *R. decaturensis* Gustafson, 1949; *R. kidderi* Pearse, 1936; *R. milleri* Choquette, 1951; *R. rotundicaudatum* Byrne, 1992; and *R. uruyeni* Díaz-Ungria, 1968; of these, *R. uruyeni* has been considered as having a doubtful taxonomic status (Cremonte *et al.* 2002; Mejía-Madrid *et al.* 2007), while *R. rotundicaudatum* and *R. californiensis* were recently synonymized with *R. cascadilla* (Moravec and Muzzal 2007). *Rhabdochona ictaluri* sp. nov. possesses several features that readily distinguish it from the other congeners reported as freshwater fish parasites from the Americas (see Moravec and Arai 1971, Maggenti *et al.* 1992, Moravec 1998, Caspeta-Mandujano 2005). One of these traits is the presence of basal teeth in the new species that sets it apart from *R. canadensis*, *R. catostomi*, *R. cotti*, and *R. kidderi*, which lack such basal teeth. The new species is also characterized by having bifurcated deirids, instead of simple deirids as in *R. decaturensis* and *R. cotti*. A third distinctive feature in *R. ictaluri* sp. nov. is the absence of a dorsal barb in the right spicule, which is present in *R. acuminata*, *R. canadensis*, *R. cascadilla*, *R. kidderi*, and *R. milleri*. Finally, the length ratio of the spicules of *R. ictaluri* sp. nov. differs from those reported for the other mentioned species.

Discussion

Rhabdochona ictaluri sp. nov. is the 12th species of the genus recorded in Mexican freshwater fishes. The new species seems to be specific of catfishes of the genus *Ictalurus* Rafinesque occurring in the Nearctic part of Mexico. Previous records of specimens of *Rhabdochona* parasitizing the intestine of ictalurid fishes in Mexico include *R. kidderi* as a parasite of *Ictalurus mexicanus* (Meek) from Hidalgo State (Aguilar-Aguilar *et al.* 2004), *R. canadensis* as a parasite of *I. balsanus* (Jordan et Snyder) in the Balsas River (Rosas-Valdez *et al.* 2007). Unidentified adult specimens of *Rhabdochona* were collected in *Ictalurus* sp., *I. furcatus* (Le Sueur), and *I. punctatus* (Rafinesque) from the river basins of the Gulf of Mexico slope (Garrido-Olvera *et al.* 2006, Rosas-Valdez and

Pérez-Ponce de León 2008), and also from *I. dugesii* and *I. pricei* in rivers of Jalisco, Nayarit and Durango (Rosas-Valdez and Pérez-Ponce de León 2008, Pérez-Ponce de León *et al.* 2009).

The new species seems to be specific to ictalurid fishes, due that numerous individual fishes of several species from the same locality or nearby localities were collected and studied for helminths, and no specimens of *R. ictaluri* sp. nov. were found. Also, there is no evidence of the presence of this nematode in ictalurids previously examined for helminth parasites in other parts of Mexico; for this reason, the finding of the new species described herein lends further support to the concept of a biogeographic core helminth fauna unique to ictalurids (Pérez-Ponce de León and Choudhury 2002), and more specifically of those ictalurid fish species belonging to the "punctatus clade" (sensu Rosas-Valdez and Pérez-Ponce de León 2008).

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