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A NEW MICROPHALLID (DIGenea) SPECIES FROM *Lontra provocax* (MAMMALIA: MUSTELIDAE) FROM FRESHWATER ENVIRONMENTS OF NORTHWESTERN PATAGONIA (ARGENTINA)

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ABSTRACT: A new microphallid species of *Maritrema* is described from the native southern river otter, *Lontra provocax* (Thomas). A naturally infected otter was found dead in the Nahuel Huapi National Park, Argentina. Ovigerous adult worms were recovered from the anterior portion of the intestine. Specimens of *Maritrema huillini* n. sp. have an unarmed genital pore and glabrous cirrus. They can be distinguished from all other species in the genus by having a long intestinal ceca extending up to three-quarters of the testes length to the level of the posterior border of the testes and a metraterm composed of a proximal sphincter, a non-muscular sac, and a distal muscular portion. This microphallid is the first species recovered from a South American eutherian host and the first digenean recorded for *L. provocax*.

In South America, most species of *Maritrema* have been described from birds (Deblock, 1971; Werding, 1973; Etchegoin and Martorelli, 1997; Cremonte and Martorelli, 1998; Díaz and Cremonte, 2010). *Maritrema pulcherrima* Travassos, 1929 is the only species in South America described from a mammal; it parasitizes *Didelphis aurita* Wied-Neuwied, 1826 from Brazil (Deblock, 1971).

In South America, 3 endemic otter species of *Lontra* are known to occur, i.e., *Lontra felina* (Molina, 1782), *Lontra longicaudis* (Olfers, 1818), and *Lontra provocax* (Thomas, 1908). The latter species, also known as the southern river otter, or huillín, inhabits Argentina and Chile between 36°S and 55°S (Fasola et al., 2006; Cassini et al., 2010). This species is predominantly freshwater and is typically found in large and small lakes, rivers, and streams. According to Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (also known as CITES), *L. provocax* is classified as endangered (Sepúlveda et al., 2008). The southern river otter is an aquatic specialist, preying mainly on macrocrustaceans like species of *Aegla* and *Samastacus* and, to a lesser extent, on fish (Medina, 1997). This otter's distribution is characterized by the presence of crustacean prey, the absence of people, and the occurrence of introduced *Neovison vison*, the American mink (Fasola et al., 2006). In South America, only a few parasitological surveys have been performed on mustelids, but particularly on *Lontra* spp. in Brazil. The parasites recorded were mainly nematodes, acanthocephalans, and digeneans (Larivière, 1998; Gardner and Thew, 2006; Vieira et al., 2008; Dronen, 2009). No helminth parasites have been reported from the endemic *L. provocax* in Chile or Argentina (Olmos and Muñoz, 2006; Lunaschi and Drago, 2007).

The purpose of the present study is to describe a new species of *Maritrema* from a naturally infected *L. provocax* found in a freshwater northwestern Patagonian habitat.

MATERIALS AND METHODS

During autumn of 2010, a single specimen of *L. provocax* was found dead in the Pichi Traful River (40°40'S, 71°24'W) in the Nahuel Huapi

National Park, Argentina. It was frozen until necropsy. Helminth parasites recovered were fixed in 10% formalin. Specimens were stained with Gomori's trichrome or hydrochloric carmine and mounted (dorsal or ventral) in Canada balsam. Measurements of intestinal ceca, metraterm, cirrus sac, and seminal vesicle were made using a calibrated curvimeter with camera lucida drawings. Drawings were also made using a camera lucida. All measurements are given in micrometers with the mean value followed by the range in parentheses.

Specimens were deposited in the Colección Nacional de Parasitología, Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires, Argentina (MACN-Pa); Colección Helminológica del Museo de La Plata, La Plata, Argentina (CHLMP); and Colección Parasitológica de la Universidad Nacional del Comahue, Bariloche, Argentina (UNCo-Pa).

DESCRIPTION

Maritrema huillini n. sp.

(Fig. 1)

Diagnosis (measurement based on 20 specimens): Body flattened, pyriform, 656 (538–758) long by 290 (259–326) wide at level of testes. Spines not observed. Oral sucker subterminal, 51 (41–58) long by 57 (46–65) wide. Ventral sucker equatorial, 46 (41–53) long by 49 (46–58) wide. Sucker ratio (ventral sucker:oral sucker) 1.0:0.92 (0.75–1.18). Prepharynx 20 (7–36) long. Pharynx muscular, 22 (18–24) long by 25 (24–29) wide. Esophagus 69 (53–94) long. Intestinal bifurcation at level of mid-forebody; intestinal ceca left 412 (361–458) long, right 408 (361–458) long, extending up to three-quarters of testes length to level of posterior border of testes. Testes oval, symmetrical, post-ovarian, slightly lobed, left testis 83 (72–115) long by 88 (72–108) wide, right testis 83 (72–101) long by 93 (65–115) wide. Vasa deferentia joining close to anterior border of ovary, forming vas efferens, which extends dextrally and enters cirrus sac ventrally. Cirrus sac muscular, thick-walled, arched, occupying space between ceca and ventral sucker, 171 (109–200) long by 45 (36–55) wide, containing seminal vesicle, pars prostatic, and cirrus organ. Seminal vesicle occupying distal half of cirrus sac, 93 (73–109) long by 31 (27–45) wide. Prostatic cells numerous. Ejaculatory duct curved. Cirrus evaginated, glabrous, 28 (22–33) long by 21 (17–23) wide. Ovary slightly lobed, dextral, sinistral margin overlapping ventral sucker, 51 (36–65) long by 64 (41–91) wide. Oviduct short. Seminal receptacle spherical, between ovary and right testis, 16 (13–19) in diameter. Ootype posterior to ovary; Mehlis' gland posterior to vitelline reservoir. Laurer's canal present. Vitelline ducts short, merging to form small vitelline reservoir situated dorsal to ootype. Vitellarium well-developed, consisting of small follicles of irregular shape forming a ring interrupted posteriorly, extending from middle of body, overlapping anterior of testes, surrounding testes and uterus. Uterine loops filling posterior space within vitellarium, not extending anteriorly beyond level of posterior extremity of ventral sucker. Metraterm in form of proximal sphincter, sac with non-muscular wall, 39 (32–45) long by 18 (9–27) wide, distal portion with strong muscularized wall, 23 (14–32) long. Genital pore sinistral to ventral sucker, simple, unarmed. Eggs numerous; oval, smooth, operculate, 19 (17–20) long by 10 (10–10) wide. Excretory vesicle Y-shaped, excretory pore terminal.

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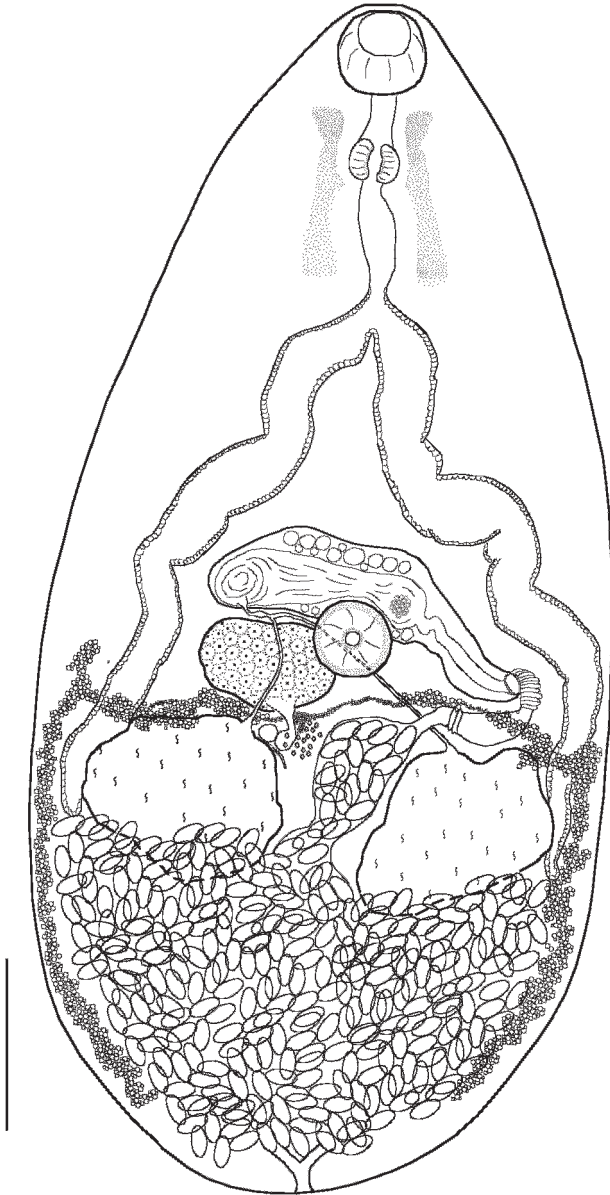


FIGURE 1. *Maritrema huillini* n. sp. composite specimen with invaginated cirrus (ventral view) obtained from *Lontra provocax*. Scale bar = 100 μ m.

Taxonomic summary

Type host: *Lontra provocax* (Thomas).

Type locality: Pichi Trafal River (40°40'S, 71°24'W) Nahuel Huapi National Park (Argentina).

Site of infection: Anterior intestine.

Intensity of infection: 5,927 worms.

Type material: One slide with the holotype, No. 533/1 and 4 slides with paratypes, No. 533/2-5 (MACN-Pa); 4 slides with paratypes, No. 6536 (CHLMP); and 11 slides with paratypes, No. 226/1-11 (UNCo-Pa).

Etymology: The species name is derived from the common name of the host, "huillín."

Remarks

The worms collected from *L. provocax* were identified as a new species of *Maritrema* based on morphological characteristics, i.e., pyriform body, subequal suckers, symmetrical and postovarian testes, intercecal cirrus sac, simple unarmed genital pore, and incomplete vitellarium surrounding

the testes and uterus (Deblock, 1971, 2008). *Maritrema huillini* n. sp., which has a glabrous cirrus, also has unique characteristics such as long intestinal ceca extending up to three-quarters of the testes length to the posterior border of testes as well as a metraterm composed of a proximal sphincter, a non-muscular sac, and a distal muscular portion.

Maritrema huillini n. sp. is similar to many species that have a glabrous cirrus but it differs from them mainly by the extension of the intestinal ceca. The new species has a long intestinal ceca extending up to three-quarters of the testes length to the level of posterior border of testes, differing from *Maritrema oocysta* (Lebour, 1907) (syn.: *Maritrema humile* Nicoll, 1907, *Maritrema innae* Leonov, 1958); *Maritrema nicolli* Travassos, 1920; *Maritrema obstipum* van Cleave et Mueller, 1932; *Maritrema ornithorhynchi* Hickman, 1955; *Maritrema afanassjewi minor* Cheng, Hsin et Tao, 1957; *Maritrema opisthometra* Leonov, 1958 (syn.: *Maritrema elongata* Deblock, Capron et Biguet, 1961); *Maritrema prolixum* Caballero et Montero, 1961; *Maritrema sobolevi* Kurotsckin, 1962; *Maritrema inusitata* Leonov et Tchimbaliouk, 1963; *Maritrema laricola* Ching, 1963 (syn.: *Maritrema longiforme* Kifume et Takao, 1972); *Maritrema belopolskaiae* Caballero, 1964; *Maritrema pyrenaica* Deblock et Combes, 1965; and *Maritrema orensensis* Cremona et Martorelli, 1998 because they have saccular intestinal ceca reaching the posterior border of the cirrus sac (Deblock, 1971; Cremona and Martorelli, 1998). In addition, the new species differs from *Maritrema linguilla* Jaegerskioeld, 1909 (syn.: *Maritrema lepidum* Nicoll 1907); *Maritrema pulcherrima* Travassos, 1929; *Maritrema macrovestibulum* Ogata, 1946; *M. afanassjewi* Belopolskaia, 1952; *Maritrema macroacetabulum* Deblock et Rosé, 1964; *Maritrema apodemium* Lewis, 1966; *Maritrema megametrios* Deblock et Rausch, 1968; *Maritrema sethsmithi* Canaris, 1971; *Maritrema majestova* Ke, 1976; and *Maritrema felii* Gracenea, Montoliu et Deblock, 1993 because they have acetabular intestinal ceca extending up to of posterior border of the ventral sucker (Canaris, 1971; Deblock, 1971; Gracenea et al., 1993). Although *Maritrema gratiosum* Nicoll, 1907 (syn.: *Maritrema arenaria* Hadley et Castle, 1940), *Maritrema subdolum* Jaegerskioeld, 1909 (syn.: *Maritrema rhodanicum* Carrère, 1936, *Maritrema ovata* Rankin, 1939), *Maritrema sachalinicum* Schumakowitsch, 1932, *Maritrema acadiae* Swales, 1933, *Maritrema longibursatus* Caballero et Brenes, 1964, *Maritrema prosthometra* Deblock et Heard, 1969, *Maritrema bravoae* Caballero et Ibáñez, 1970, *Maritrema paracadae* Ching, 1974, and *Maritrema chiriaca* Deblock, 1975 have long intestinal ceca reaching the testes, they differ from *M. huillini* in having avian definitive hosts (Deblock, 1971, 1975; Caballero and Ibáñez, 1970; Ching, 1974). Additionally, the ventral sucker of the new species is in an equatorial position, in contrast to *M. subdolum* and *M. chiriaca*, in which it is post-equatorial (Deblock, 1971, 1975; Kostadinova and Gibson, 1994). In *M. huillini*, the body size (538–758) and cirrus sac (109–200) are smaller than in *M. sachalinicum* (900–1,000 and 250, respectively), and in *M. longibursatus* (more than 1,000 and 1,000–1,200, respectively) (Deblock, 1971). The new species has a longer egg (18–20) than does *M. bravoae* (14) (Caballero and Ibáñez, 1970). Moreover, the muscular portion of the metraterm (14–32) is shorter for the new species than for *M. gratiosum* (80–90), *M. acadiae* (40–50), *M. prosthometra* (100), and *M. paracadae* (40–50) (Deblock, 1971; Ching, 1974). *Maritrema huillini* represents the first species in the genus from South American eutherian hosts and is also the first record of a digenean for *L. provocax* in South America.

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