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**First record of *Philometra katsuwoni* (Nematoda, Philometridae),
a parasite of skipjack tuna *Katsuwonus pelamis*
(Perciformes, Scombridae), off South American Atlantic Coast**

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CÁRDENAS, M.Q., MORAVEC, F. & KOHN, A. **First record of *Philometra katsuwoni* (Nematoda, Philometridae), a parasite of skipjack tuna *Katsuwonus pelamis* (Perciformes, Scombridae), off South American Atlantic Coast.** Biota Neotrop., 9(2): <http://www.biotaneotropica.org.br/v9n2/en/abstract?short-communication+bn01809022009>.

Abstract: The nematode *Philometra katsuwoni* Petter & Baudin-Laurencin, 1986, a gonad-infecting parasite of *Katsuwonus pelamis* (Linnaeus 1758), originally described from the Gulf of Guinea, is reported for the first time from the coastal zone of Rio de Janeiro State, Brazil. As compared with the original description, the males of the Brazilian material are generally somewhat larger and their right spicule and the gubernaculum are longer. The subgravid female is described for the first time. It is characterized by the anterior inflation of the esophagus and by the presence of two distinct caudal lobes.

Keywords: Brazil, fish parasite, nematode, helminth.

CÁRDENAS, M.Q., MORAVEC, F. & KOHN, A. **Primeiro registro de *Philometra katsuwoni* (Nematoda, Philometridae), parasitando *Katsuwonus pelamis* (Perciformes, Scombridae), ocorrentes ao largo da Costa Atlântica da América do Sul.** Biota Neotrop., 9(2): <http://www.biotaneotropica.org.br/v9n2/pt/abstract?short-communication+bn01809022009>.

Resumo: *Philometra katsuwoni* Petter & Baudin-Laurencin 1986, nematóide parasito do ovário de *Katsuwonus pelamis* (Linnaeus 1758), originalmente descrito no Golfo da Guiné, é referido pela primeira vez na zona costeira do Estado do Rio de Janeiro, Brasil. Comparados com a descrição original, os machos do material brasileiro são um pouco maiores e possuem o espículo direito e o gubernáculo mais longos. A fêmea subgrávida é descrita pela primeira vez. Ela se caracteriza pela região anterior do esôfago inflada e pela presença de dois lobos caudais distintos.

Palavras-chave: Brasil, parasito de peixe, nematóide, helminto.

Introduction

Species of *Philometra* Costa, 1845 (Dracunculoidea, Philometridae) infecting gonads of marine fishes are widely distributed in all oceans (Moravec 2006). Pathogenic effects of these parasites, such as sucking of blood, atrophy of developing ova, fibrosis of ovarian tissue, increasing numbers of granulocytes and haemorrhages (Moravec et al. 2002), may cause a serious damage to fish ovaries, affecting thus fish reproduction (Moravec et al. 2006, Moravec & Salgado-Maldonado 2007). Some of these parasites are known to be agents of serious diseases of fish with economic importance. Therefore, especially with quickly developing cultures of marine fishes, the study of these nematodes is highly desirable.

During recent investigations into helminth parasites of the skipjack tuna, *Katsuwonus pelamis* L. (Perciformes, Scombridae), off the Atlantic coast of Brazil, specimens referable to the little-known philometrid species *Philometra katsuoni* Petter & Baudin-Laurencin, 1986 were found. Their subsequent study resulted in obtaining some new morphometrical data, which are presented herein.

Material and Methods

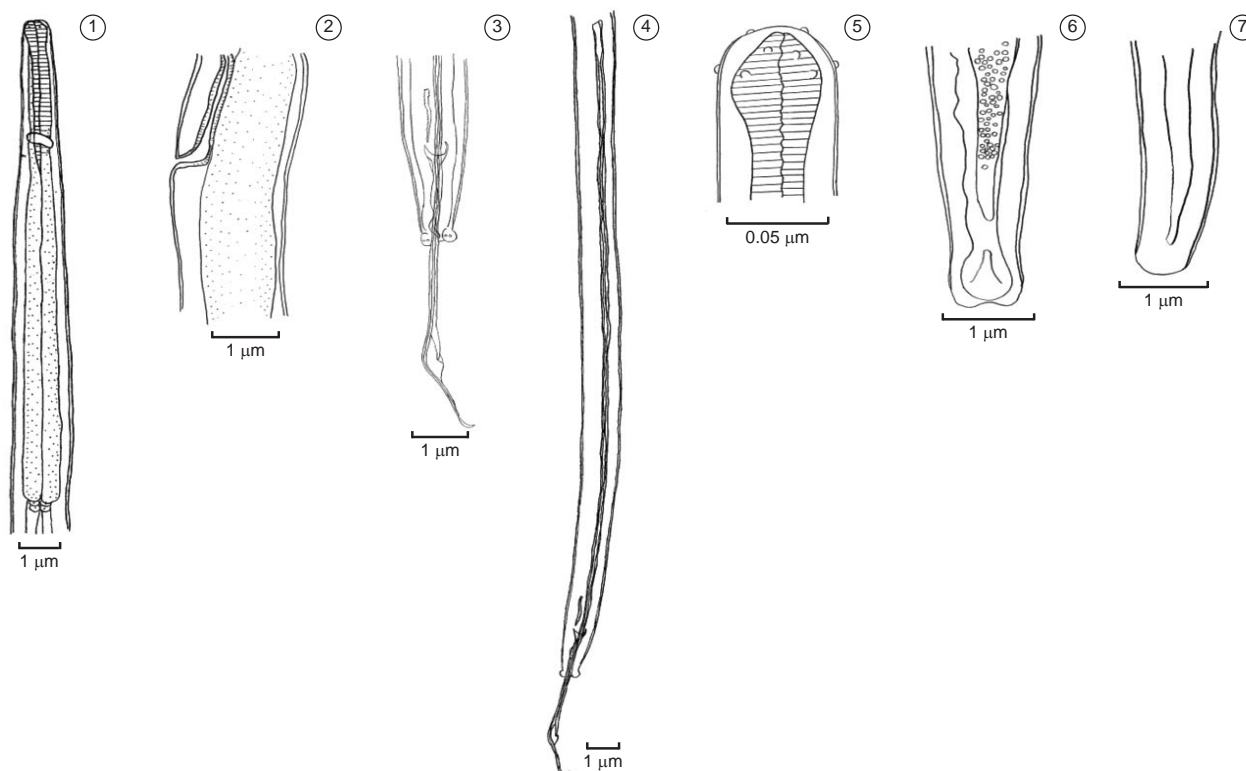
Helminth parasites of skipjack tuna *K. pelamis* obtained from the Atlantic Ocean, off Cabo Frio, State of Rio de Janeiro, Brazil (22° 52' 46" S and 42° 01' 07" W) were investigated. The gonads were examined in separate Petri dishes containing 0.85% NaCl solution. Nematodes were fixed with hot 70% ethanol GL. For light microscopy

study, nematodes were cleared in 50% phenol. Some specimens were preserved in Canada balsam and other material was maintained in vials in ethanol; specimens were deposited in the Helminthological Collection of the Oswaldo Cruz Institute (CHIOC). Photomicrographs were taken using a Nikon® Eclipse E800 micrographic system with a differential interference contrast (DIC) apparatus or a phase contrast system of Zeiss® Axiophot microscope. Measurements are in micrometers (µm) unless otherwise indicated, quoted as the ranges with means in parentheses followed by the number of specimens measured (n).

Results and Discussion

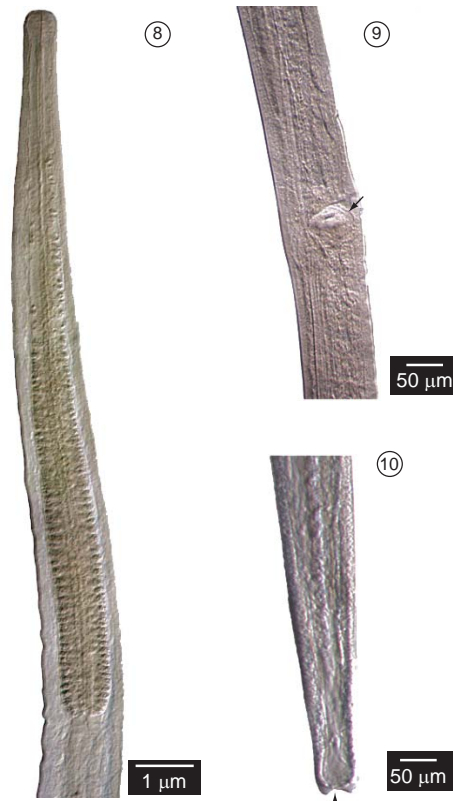
1. *Philometra katsuoni* Petter & Baudin-Laurencin, 1986

Male (based on 7 specimens) (Figures 3-5, 11-14): Body filiform, whitish, very thin, with smooth cuticle. Body 8.64-17.13 (14.46) mm long (n = 7) and 120-175 (157) wide (n = 7) at mid-portion of body. Cephalic end rounded. Mouth small, surrounded by indistinct cephalic papillae. Esophagus narrow, 950-1,850 (1,360) long (n = 6), with not well differentiated glandular region. Esophagus opens into intestine through distinct paired bilobed valve; ventriculus not observed. Nerve ring situated 163-315 (239) (n = 2) from anterior extremity. Excretory pore located 315-375 (355) (n = 3) from anterior end of body,



Figures 1-7. *Philometra katsuoni*. 1) Anterior region of female. 2) Lateral view of vulva. 3) Detail of posterior end of male, ventral view. 4) Posterior end of male. 5) Anterior end of male. 6) Posterior end of female, ventral view. 7) Posterior end of female, lateral view.

Figuras 1-7. *Philometra katsuoni*. 1) Região anterior da fêmea. 2) Vista lateral da vulva. 3) Detalhe da região posterior do macho, vista ventral. 4) Região posterior do macho. 5) Região anterior do macho. 6) Região posterior da fêmea, vista ventral. 7) Região posterior da fêmea, vista lateral.



Figures 8-10. Female of *Philometra katsuwoni* observed by differential interference contrast (DIC). 8) Esophageal region of body. 9) Vulva (see arrow). 10) Ventral view of bilobed caudal end (arrowhead).

Figuras 8-10. Fêmea de *Philometra katsuwoni* observada por contraste diferencial interferencial (DIC). 8) Região esofágica do corpo. 9) Vulva (ver seta). 10) Vista ventral mostrando a terminação bilobada da cauda (cabeça de seta).

near nerve ring. Posterior end of body blunt, with two lobules (Figures 3, 4, 11, 13, 14). Each lobule contains two hardly visible papillae. Spicules narrow and unequal in length (Figure 4). Right spicule very long, measuring 2,150-2,570 (2,330) (n = 7), slender, needle-like, with membranous enlargement at posterior region and with pointed membranous distal tip (Figures 3, 4, 11, 12). Left spicule very short and less sclerotized, measuring 75-115 (97) in length (n = 5), with rugose surface (Figures 3, 4, 13, 14). Spicule length ratio 1:21-33 (n = 5). Gubernaculum 150-163 (152) long (n = 7), longer than shorter spicule; its anterior end curved (Figures 3, 13, 14).

Female (based on 5 subgravid specimens; 3 of them fragmented) (Figures 1-2, 6-10): Body filiform, whitish, very thin, with smooth cuticle; length 31.14-33.5 mm (n = 2), width at mid-portion of body 125-160 (n = 2). Cephalic end rounded. Mouth small, surrounded by indistinct cephalic papillae. Total length of esophagus 1,225-1,400 (n = 4). Length of muscular and glandular regions of esophagus 365-550 (n = 4) and 730-920 (n = 4), respectively; in some specimens, division into two regions indistinct (Figures 1, 8). Anterior end of esophagus with distinct bulbous inflation. Nerve ring situated 300-395 (n = 3) from anterior extremity (Figures 1). Posterior end of body rounded in lateral view and bilobed in ventral view (Figures 6, 7, 10). Vulva situated 10 mm from posterior end in one specimen 33.5 mm long (Figures 2, 9).

Host: *Katsuwonius pelamis* L.

Site of infection: gonads.

Locality: Cabo Frio, State of Rio de Janeiro, Brazil (collected in October 2006).

Specimens deposited: CHIOC 37224 (slide); 35660 a-b (vials).

The morphology of specimens of the present material is, more or less, in agreement with the original description of *Philometra katsuwoni* provided by Petter & Baudin-Laurencin (1986). However, the males (except for one) of the Brazilian material were generally distinctly larger (14-17 vs. 9.5-12 mm long); the right spicule (2.15-2.57 vs. 1.75-2.08 mm) and the gubernaculum (150-163 vs. 130-145) were also longer but, on the contrary, the left spicule was of a similar length



Figures 11-14. *Philometra katsuwoni* male. 11) Phase contrast of male posterior region. 12) Detail of right spicule indicating membranous enlargement at posterior region (large arrow) and pointed membranous distal tip (arrowhead). 13) Differential interference contrast (DIC) of posterior region of male showing right spicule (large arrow), left spicule (arrowhead) and gubernaculum (thin arrow). 14) Phase contrast of posterior region of male showing right spicule (large arrow), left spicule (arrowhead) and gubernaculum (thin arrow).

Figuras 11-14. Macho de *Philometra katsuwoni*. 11) Contraste de fase da região posterior do macho. 12) Detalhe do espículo direito indicando uma expansão membranosa na região posterior (seta larga) e uma ponta distal membranosa (cabeça de seta). 13) Contraste interferencial diferencial (DIC) da região posterior do macho mostrando o espículo direito (seta larga), o espículo esquerdo (cabeça de seta) e o gubernáculo (seta fina). 14) Contraste de fase da região posterior do macho mostrando o espículo direito (seta larga), o espículo esquerdo (cabeça de seta) e o gubernáculo (seta fina).

(75-115 vs. 65-95). Petter & Baudin-Laurencin (1986) had only body fragments of a juvenile female of *P. katsuwoni* at their disposal; they only mentioned that the cephalic structure was similar to that of the male and the posterior extremity was rounded, without any caudal projections. The morphology and measurements of conspecific subgravid females are provided for the first time in this paper. It shows that, as in the majority of *Philometra* spp., the female oesophagus of *P. katsuwoni* is bulbously inflated at its anterior end and the female posterior end is provided with two distinct lateral caudal lobes.

The authors are aware of the fact that the morphology of *P. katsuwoni* will require further study, because some taxonomically important features, such as the number and arrangement of cephalic papillae or the detailed structure of the male caudal end, can be properly studied only using scanning electron microscopy (Moravec 2006); this has not yet been used for this species. It will also be necessary to describe conspecific gravid (larvigerous) females and their larvae, whose body lengths are also important for the taxonomy of gonad-infecting philometrids. Moravec (2006) considered large-sized (body length up to 95 cm) gravid females of a *Philometra* sp. recorded from *Katsuwonus pelamis* of the Indian Ocean near the Maldives to possibly belong to *P. katsuwoni*.

Philometra katsuwoni was originally described from ovaries of *K. pelamis* from the Gulf of Guinea (Petter & Baudin-Laurencin 1986) and was not recorded since. This is the second finding of this parasite and its first record off the Atlantic coast of Brazil and South America. The fauna of gonad-infecting philometrids remains poorly known in Brazil. The only two previous records are those by Crisp & Klein (1973) reporting *Philometra lateolabracis* (Yamaguti, 1935) (= *Philometra* sp. – see Quiazon et al. 2008) from *Haemulon plumieri* (Lacépède) and Rego et al. (1983) reporting *Philometra* sp. (=probably *P. saltatrix* Ramachandran, 1973) from *Pomatomus saltatrix* (Linnaeus).

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