

Neocucullanus neocucullanus Travassos, Artigas et Pereira, 1928 (Nematoda: Cucullanidae) from the Characidae fish, *Brycon hilarii* Valenciennes, 1850, from Brazil

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During investigation on the helminth parasites from Brycon hilarii Valenciennes, 1850 (Characiformes, Characidae), from River Juba, Tangará da Serra, state of Mato Grosso, Brazil, several specimens of the nematode Neocucullanus Travassos, Artigas et Pereira, 1928 were detected. A detailed study of this material, including scanning electron microscopy, allowed to identify these nematodes as N. neocucullanus Travassos, Artigas et Pereira, 1928 and to confirm N. multipapillatus Petter, 1989 as a junior synonym of N. neocucullanus.

Key words: characid fish - *Brycon hilarii* - nematode - *Neocucullanus* - Brazil

During investigation on the helminth parasites from the Characid fish, *Brycon hilarii* Valenciennes, 1850, from River Juba, Tangará da Serra, state of Mato Grosso, Brazil, several specimens of the nematode *Neocucullanus* Travassos, Artigas et Pereira, 1928 were collected. To date only two species of *Neocucullanus* have been reported both in the intestine of characid fishes (Moravec 1998). *N. neocucullanus* Travassos, Artigas et Pereira, 1928 was detected in the River das Velhas basin, Lassance, state of Minas Gerais, Brazil (Travassos et al. 1928) and recently in the Usumacinta River, Frontera Echeverria, state of Chiapas, Mexico (Caspeta-Mandujano et al. 2005). *N. multipapillatus* Petter, 1989 was detected in Paraná River basin, Arroyo, Tagatija-guazu, Conception Province, Paraguay (Petter 1989). According to Petter (1989) *N. multipapillatus* differs from *N. neocucullanus* mostly by the absence of small caudal alae and the presence of one unpaired precloacal papilla on the male posterior extremity. A detailed study of the material collected in the present work, including scanning electron microscopy (SEM), allowed to identify these nematodes as *N. neocucullanus* and to confirm *N. multipapillatus* as a junior synonym of *N. neocucullanus*.

MATERIALS AND METHODS

Fish specimens (n = 60) were captured from River Juba (14° 50'09.9"S and 57°51'13.5"W), Tangará da Serra, state of Mato Grosso, Brazil, from August 2003 to January 2004, by fishing rods. Fishes were deep-frozen after capture and dissected in the laboratory. Nematodes recovered from digestive tract were washed in physiological saline, fixed in 5% formalin and stored in 70% ethanol. For light

microscope examination, nematodes were cleared in glycerine. Drawings were made with the aid of a Zeiss microscope drawing attachment using Nomarski's interference contrast. Two specimens (one male and one female) were dehydrated through a graded ethanol series, critical point dried, coated with gold and examined in a SEM.

RESULTS

Neocucullanus neocucullanus (Figs 1-2)

Description - Large sized nematodes without lateral alae. Oral opening elongated dorsoventrally surrounded by membranous collarette with row of numerous denticles. Four submedian cephalic papillae. Oesophagus muscular more or less equally expanded at its anterior and posterior parts. Pseudobuccal capsule (oesophastome) well developed. Oesophagus lumen sclerotized up to posterior part of nerve ring. Nerve ring prominent in the posterior part of first half of oesophagus. Deirids well visible and well posterior to nerve ring. Excretory pore in region of deirids. Intestinal caecum absent. Pair of small lateral phasmids present in tail. Tail rounded with terminal mucron.

Male (based on 3 specimens) - Length of body 16-24 mm, width 0.49-0.81 mm. Entire oesophagus 0.92-1.15 mm long, minimum width 0.08-0.13 mm, maximum width 0.19-0.22 mm. Oesophastome 0.20-0.21 mm long and 0.09-0.11 mm wide. Nerve ring, excretory pore (observed in one specimen) and deirids 0.41-0.47 mm, 0.71 mm, and 0.65-0.82 mm, respectively, from anterior extremity. Precloacal sucker present, situated 1.00-1.30 mm from posterior extremity. 14 pairs of caudal papillae: 10 preanal (3 pairs subventral and anterior to sucker; 3 pairs subventral at level of sucker; 2 pairs subventral posterior to sucker; and 2 pairs subventral between unpaired median preanal papilla and anal aperture) and 4 postanal (3 subventral and 1 lateral). Unpaired median preanal papilla prominent. Spicules broad 0.49-0.73 mm long, with rounded and moderately sclerotized distal ends. Gubernaculum absent. Tail rounded 0.19-0.32 mm long with terminal mucron.

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Female (based on 6 specimens) - Length of body 21-48 mm, maximum width 0.65-0.90 mm. Entire oesophagus 1.05-1.25 mm, minimum width 0.08-0.11 mm, maximum width 0.20-0.25 mm. Oesophastome 0.21-0.24 mm long and 0.11-0.15 mm wide. Nerve ring, excretory pore (observed in one specimen) and deirids 0.43-0.47 mm, 0.85 mm and 0.79-0.94 mm, respectively, from anterior extremity. Vulva pos-equatorial 10-18 mm from posterior extremity. Vulval lips elevated. Tail 0.20-0.26 mm long with terminal mucron.

Host - *Brycon hilarii*.

Site of infection - Intestine and pyloric caecum.

Locality - River Juba, state of Mato Grosso, Brazil (14°50' 09.9"S, 57° 51' 13.5"W).

Prevalence and intensity - 13.3% and 1.6 ± 0.52 (1-2).

Deposition of voucher specimens - Instituto Oswaldo Cruz, Rio de Janeiro, Brazil (35446, 35447).

In the present study specimens of *N. neocucullanus* were only detected in the wet season.

DISCUSSION

The genus *Neocucullanus* Travassos, Artigas et Pereira, 1928 is easily distinguished from other genera of Cucullanidae which occur in fish by a short and rounded caudal extremity and by very broad spicules with rounded distal extremity (Petter 1989, Moravec 1998).

The specimens studied in this work were initially iden-

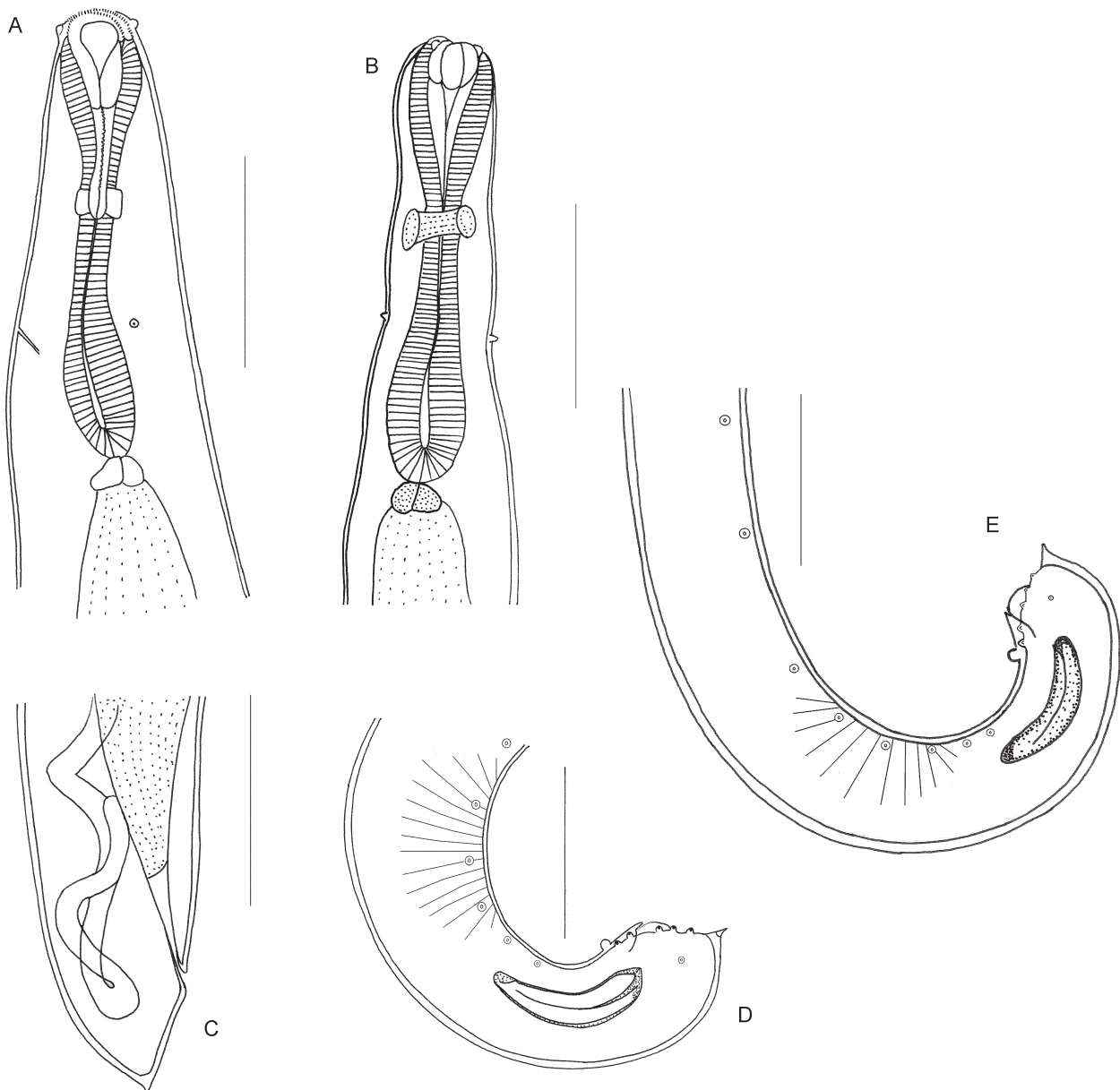


Fig. 1: *Neocucullanus neocucullanus*. A, B: anterior end of body, lateral and dorsoventral views; C: posterior end of female, lateral view; D, E: posterior end of male, lateral views. Scale bar: A, B, C, and E = 0.5 mm, D = 1 mm.

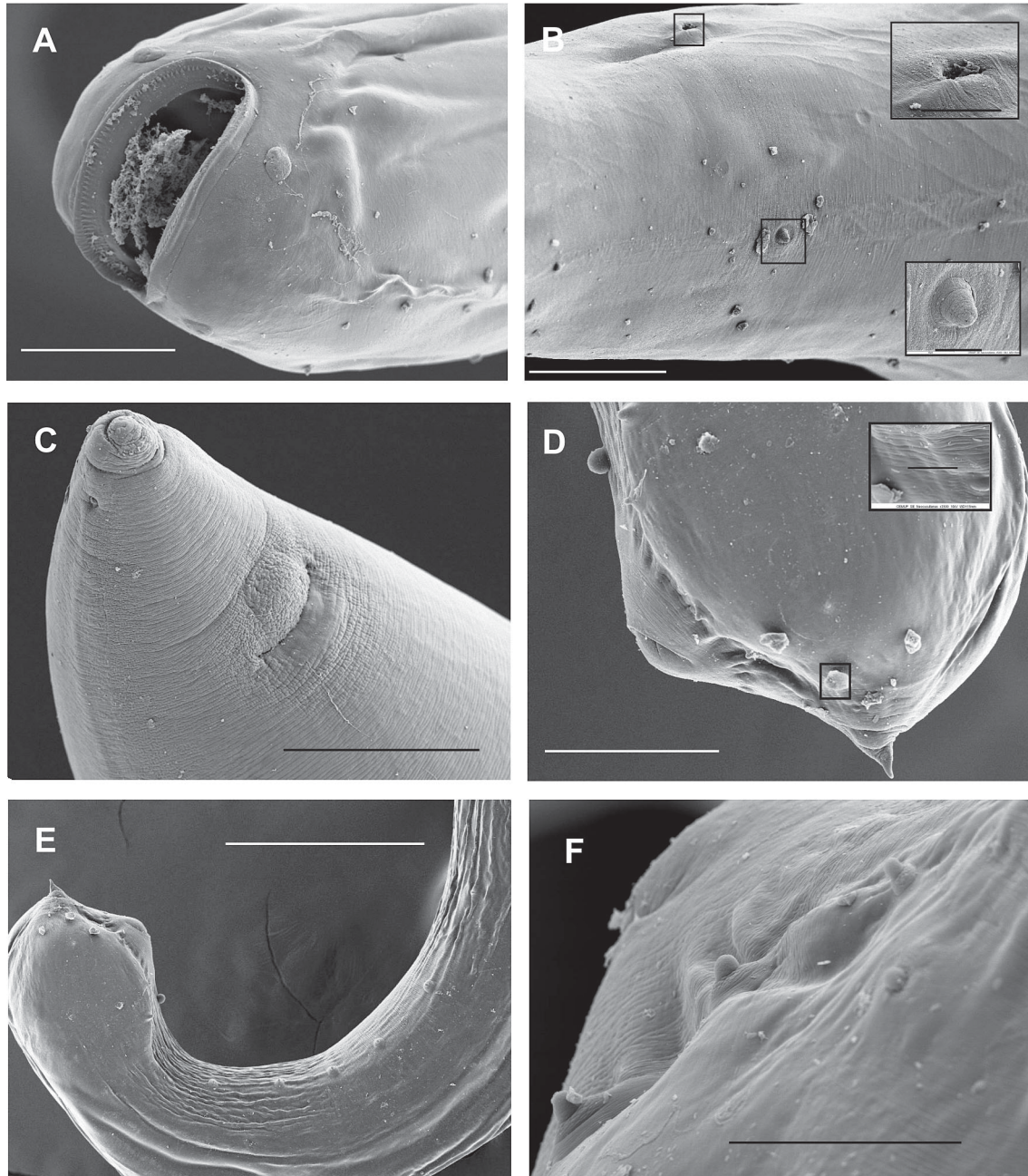


Fig. 2: *Neocucullanus neocucullanus*, scanning electron micrographs. A: cephalic end; B: position of excretory pore and deirid, ventrolateral view. Inserted excretory pore (scale bar = 20 μm) and deirid (scale bar = 10 μm); C: tail of female; D: tail of male, lateral view. Inserted postanal lateral papilla partially occluded (scale bar = 16 μm); E: posterior extremity of male, lateral view; F: tail of male with well visible postanal papillae (3 subventral and 1 lateral). Scale bar: A, B, C and D = 100 μm , E = 300 μm , F = 30 μm .

tified as *N. multipapillatus* because, as it is defined for this species, they have not caudal alae and present an unpaired precloacal papilla. The position of deirids, posterior to nerve ring level, was also in accordance to this species description, and differed from *N. neocucullanus* described by Travassos et al. (1928) since the drawings of these authors showed the deirids at nerve ring level. On the other hand the absence of gubernaculum as well as the number of preanal papillae (10) observed is in ac-

cordance to *N. neocucullanus* description. Petter (1989) observed 9 pairs of preanal and 5 pairs of postanal papillae in *N. multipapillatus*.

Caspeta-Mandujano et al. (2005) detected specimens considered as *N. neocucullanus* in *B. guatemalensis* from Mexico. Although they were very similar to those found in the present study, these authors referred the presence of 13 pairs of caudal papillae in males; 8 preanal (plus the unpaired median papilla), 1 adanal and 4 postanal (3

subventral and 1 lateral). During this study we noticed that according to Reis et al. (2003) and Froese and Pauly (2005) *B. microlepis* Perugia, 1897, the fish host where Petter detected *C. multipapillatus*, was considered a junior synonym of *B. hilarii*. On the other hand Travassos et al. (1928) detected *N. neocucullanus* in a "Characidae sp." and it is possible that this species belongs to the genera *Brycon*. According to Petter (1989) the two species are very similar and in her opinion it can not be excluded, after the study of more specimens, that both species could be considered the same.

All these observations confirm *N. multipapillatus* as a junior synonym of *N. neocucullanus* which is a Neotropical nematode that can occur in several species of the genus *Brycon* Müller & Troschel, 1844 and has been detected so far in Mexico, Brazil, and Paraguay.

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