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VERSITA

Redescription of *Brasilochondria riograndensis* (Copepoda, Chondracanthidae) parasitic on flounder, *Paralichthys orbignyanus* (Actinopterygii, Pleuronectiformes) from South American Atlantic waters

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Abstract

Brasilochondria riograndensis Thatcher et Pereira, 2004 (Copepoda, Chondracanthidae) is redescribed based on newly collected material from the branchial cavity of flounder, *Paralichthys orbignyanus* (Valenciennes, 1842), from the coasts of Buenos Aires Province, Argentina. A number of details were overlooked and some appendages were misidentified in original description and are included herein. These are: the distribution and the number of setae and spines in the antennule, the armature and segmentation of mandible, maxillule, maxilla, and maxilliped, pedigerous segments and genitoabdomen, in both, females and males. Moreover, the geographical distribution of this parasite species is broadened.

Key words

Brasilochondria riograndensis, Copepoda, redescription, *Paralichthys orbignyanus*, Pleuronectiformes

Introduction

The Chondracanthidae Milne Edwards, 1840 is a family of highly modified parasitic copepods found on fishes representing various taxa of marine fishes (Kabata 1979). Two subfamilies are recognized: Chondracanthinae Milne Edwards, 1840 and Lernentominae Oakley, 1927.

The classification within the family is unstable as most genera were defined solely on adult female characters, with much emphasis on body shape and on the number, shape, and distribution of body processes. Furthermore, there is evidence that the shape of the body, and the size and number of body processes, can change with maturity in some species (Ho 1970, Kabata 1979) and can even be affected by fixation methods. For this reason it is necessary to provide descriptions as complete as possible of copepods belonging to this family, in order to help to clarify the systematics of the family.

Recently, Thatcher and Pereira (2004) described a new genus and species of Chondracanthidae, *Brasilochondria riograndensis* Thatcher et Pereira, 2004, from a flounder, *Paralichthys orbignyanus* (Valenciennes, 1842) caught in Brazilian waters. During parasitological surveys, carried out on specimens of *P. orbignyanus* from Argentina, parasitic copepods resembling to *B. riograndensis* were found in their gill chambers. A careful re-examination of specimens showed a number of morphological features of both males and females that were previously overlooked or incompletely presented in the original description. The aim of this work was, therefore, to redescribe *B. riograndensis*, including details of the general morphology and cephalic appendages not provided in the original description.

Materials and methods

A total of 75 specimens of the flounder, *P. orbignyanus*, captured in the Mar Chiquita coastal lagoon (37°32´S, 57°19´W) and the Bahía Blanca estuary (38°45´S, 62°15´W), 20 and 55 from each locality, respectively, were examined for parasitic copepods. The parasites were removed from branchial chamber, fixed, and stored in 70% ethanol; the appendages were dissected, cleared in lactic acid, and examined under a light

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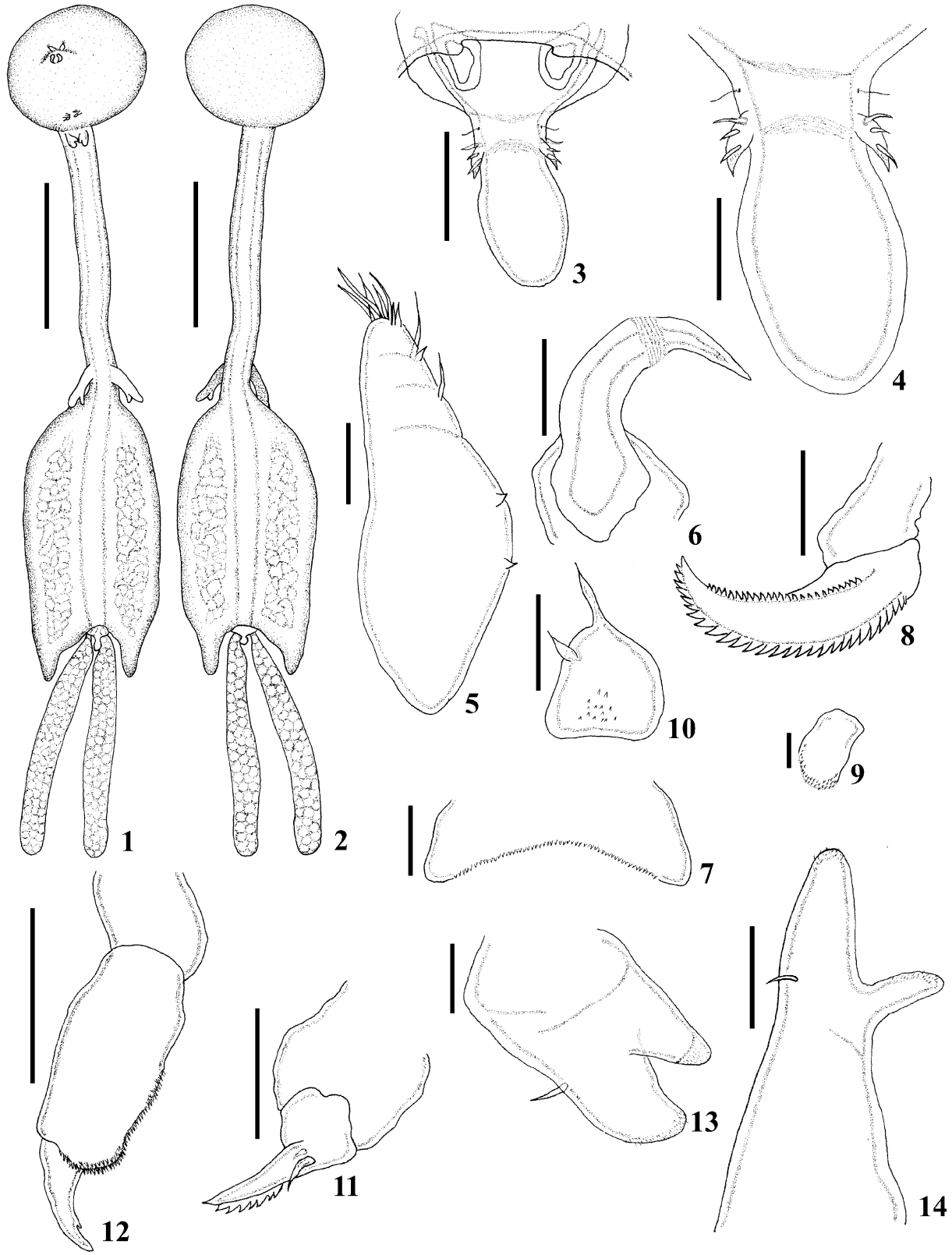
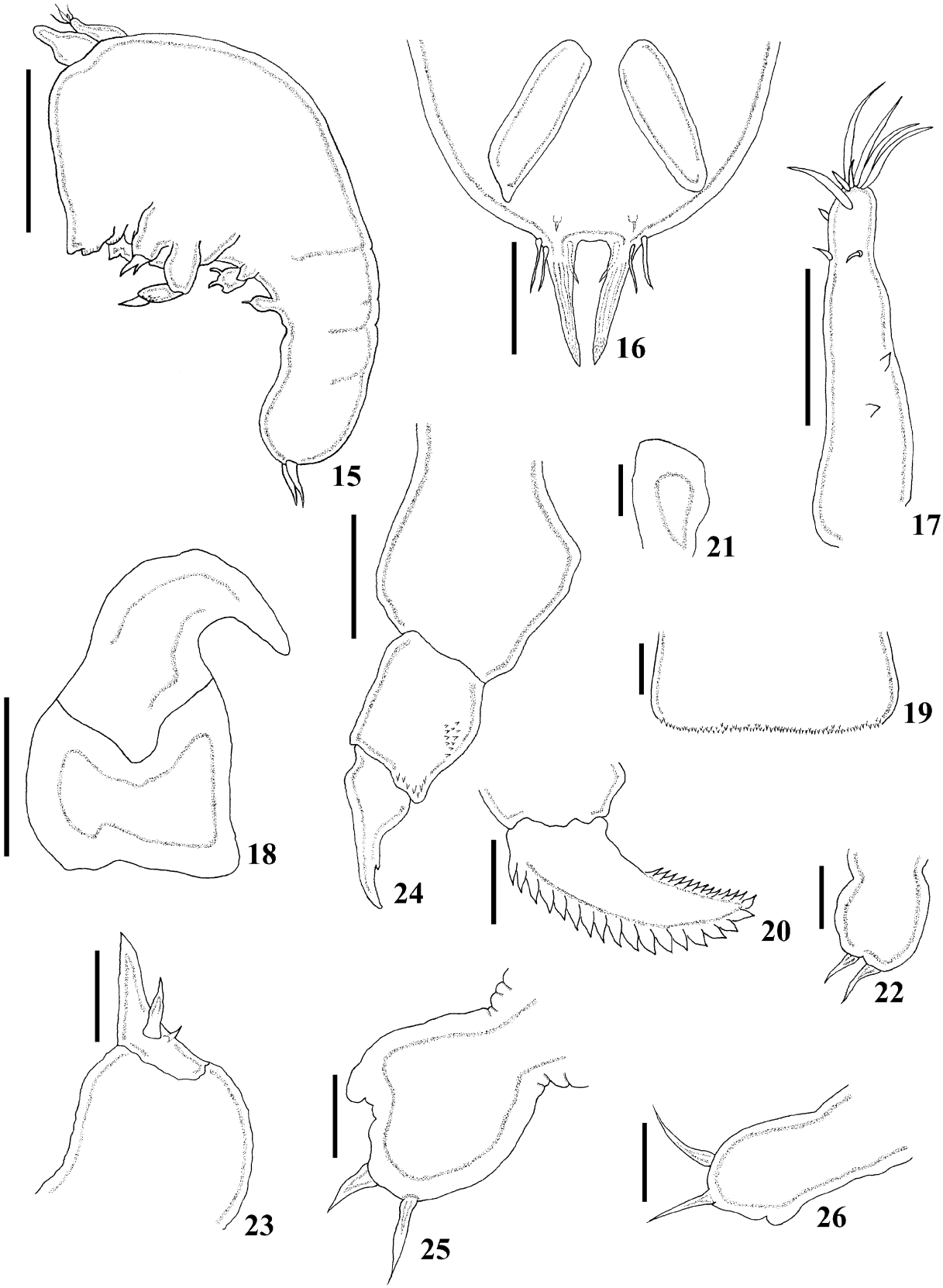


Figs 1–14. *Brasilochondria riograndensis*, female: **1.** Habitus, ventral view. **2.** Habitus, dorsal view. **3.** Genitoabdomen, ventral view (general). **4.** Genitoabdomen, ventral view (detail). **5.** Antennule. **6.** Antenna. **7.** Labrum. **8.** Mandible. **9.** Paragnath. **10.** Maxillule. **11.** Maxilla. **12.** Maxilliped. **13.** Leg 1. **14.** Leg 2. Scale bars = 3 mm (1 and 2), 0.25 mm (3 and 14), 0.125 mm (4 and 13), 0.05 mm (5, 8 and 11), 0.1 mm (6 and 12), 0.025 mm (7), 0.015 mm (9) 0.0375 mm (10)



Figs 15–26. *Brasilochondria riograndensis*, male: **15.** Habitus, lateral view. **16.** Genitoabdomen, general view. **17.** Antennule. **18.** Antenna. **19.** Labrum. **20.** Mandible. **21.** Paragnath. **22.** Maxillule. **23.** Maxilla. **24.** Maxilliped. **25.** Leg 1. **26.** Leg 2. Scale bar = 0.125 mm (15), 0.05 mm (16–18, 23 and 24), 0.025 mm (19), 0.015 mm (20–22), 0.02 mm (25 and 26)

microscope. Illustrations were made using a drawing tube. Measurements are the mean followed by the range in parentheses. All measurements are in millimetres.

Results

***Brasilochondria riograndensis* Thatcher et Pereira, 2004** (Figs 1–26)

Redescription. Female (Figs 1–14): Measurements based on 9 specimens. Body divided into spherical head, elongate and slender neck, and trunk flattened dorso-ventrally. Trunk extended postero-laterally, forming two lobes, parallel to genitoabdomen (Figs 1–2). Total length 16.87 (14.42–20.04). Head 2.23 (1.56–3.27) long and 2.31 (1.63–3.23) wide, with conical antennal region projecting antero-ventrally. Neck region cylindrical, formed by first and second pedigerous somite. Neck 7.50 (6.02–9.26) long and 0.54 (0.43–0.65) wide. Trunk 7.27 (6.42–7.99) long and 3.39 (2.9–4.06) wide. Genital somite conical, 0.29 (0.23–0.33) long and 0.43 (0.34–0.49) wide, attached to postero-dorsal surface of trunk. Abdomen globular, small, 0.32 (0.25–0.38) long and 0.16 (0.14–0.20) wide, broadly fused with genital complex, carrying one pair of dorsal setules (Fig. 3). Caudal ramus consisting of large, pointed outgrowth with simulated tip and armed with 3 setae (1 dorsal and 2 ventral), terminal portion bearing spinules (Fig. 4). Egg sacs cylindrical, multiseriate, 7.21 (6.97–7.44) long and 0.51 (0.47–0.58) wide. Antennule small, with slightly swollen basal portion, with 2 ventral spines and 3 subterminal marginal setae (2 long and 1 short); and tipped with 7 naked setae (5 long and 2 short) (Fig. 5). Antenna 2-segmented, terminal segment resembling recurved hook with striated ring near mid-length, without accessory antennule (Fig. 6). Labrum with fine spinules on posterior margin (Fig. 7). Mandible 2-segmented, terminal blade with 27–31 teeth on convex side and 25–30 smaller teeth on concave side (Fig. 8). Paragnath a small fleshy lobe armed distally with spinules (Fig. 9). Maxillule resembling small lobe bearing 2 elements and a patch of spinules (Fig. 10). Maxilla 2-segmented, first segment robust and unarmed, second segment armed with 2 setae at basal portion (one large and other small) and with a row of 7–15 teeth on inner edge of terminal process (Fig. 11). Maxilliped 3-segmented, first segment robust and unarmed, second segment with lobate distal end bearing a rows of spinules on inner edge, terminal segment small, claw-like with denticle at distal third of concave side (Fig. 12). Two pairs of biramous legs present. Leg 1 reduced, situated on neck immediately posterior to head, with protopod bearing outer seta; with exopod larger than endopod; both with patches of terminal spinules (Fig. 13). Leg 2 large, situated near junction between neck and trunk, biramous, long protopod with small outer seta, rami cylindrical and tapering distally, exopod longer than endopod; both with terminal spinules (Fig. 14).

Male (Figs 15–26): Measurements based on 5 specimens. Body 0.72 (0.54–0.83) long and 0.34 (0.33–0.36) wide, strongly bent ventrally (Fig. 15). Cephalosome globose and much larger than remaining parts of body. Body segmentation indistinct but division between cephalosome and first pedigerous somite distinct mainly in dorsal view. Main body flexure located between second pedigerous somite and genitoabdomen. Genital complex with ventrolateral ridges (Fig. 16). Abdomen broadly fused with genital somite and indistinct. Caudal ramus pilous armed with 4 naked setae; a pair of dorsal setules at base, 2 ventrolateral setules, and 1 dorsolateral setule. Antennule small, slightly swollen at base, with 2 ventral spines, 1 ventral short seta, 2 lateral short setae, 1 subterminal long seta and tipped with 6 setae (4 long and 2 short) (Fig. 17). Antenna 2-segmented, robust terminal segment uncinate without accessory antennule (Fig. 18). Labrum with denticles in posterior margin (Fig. 19). Mandible 2-segmented, terminal blade with 17–20 teeth on convex side and 12–14 smaller teeth on concave side (Fig. 20). Paragnath resembling small lobe (Fig. 21). Maxillule in form of naked small lobe bearing 2 elements (Fig. 22). Maxilla 2-segmented, first segment robust and unarmed, second segment armed with 2 setae (1 large and other small) at basal portion, and a terminal process without teeth (Fig. 23). Maxilliped 3-segmented, first segment robust and unarmed, second segment with lobate distal end bearing spines on inner edge, terminal segment a small claw with denticle on concave side (Fig. 24). Two pairs of reduced biramous legs present, both lobate; leg 1 (Fig. 25) with protopod bearing an outer seta. Exopod lobate, bearing 1 seta; small endopod conical, lobated, and unarmed. Leg 2 (Fig. 26) smaller than leg 1, with protopod bearing an outer seta. Exopod tipped with 1 seta.

Host: *Paralichthys orbignyanus* (Valenciennes, 1842) (Actinopterygii, Pleuronectiformes).

Site: Inner side of operculum, with head and neck buried into the host tissue.

Locality: Mar Chiquita coastal lagoon (37°32´S, 57°19´W) and Bahía Blanca estuary (38°45´S, 62°15´W).

Prevalence: 10% and 21.25% (Mar Chiquita coastal lagoon and Bahía Blanca estuary, respectively).

Mean intensity: 3 and 1.3 (Mar Chiquita coastal lagoon and Bahía Blanca estuary, respectively).

Material deposited: Voucher specimens (2 females, 1 with attached male) are deposited in the Carcinological Collection of the Museo de La Plata (CHMLP), La Plata, Argentina. Collection No. 26110.

Discussion

After examination of the newly collected material it is evident that most morphological features are consistent with those of *Brasilochondria riograndensis* described previously by Thatcher and Pereira (2004) from *Paralichthys orbignyanus* from Brazil. Many details or appendages, however, were misidentified or overlooked in the original description, and are given herein. Those details include: the distribution and the number of setae and spines in the antennule, the armature

and segmentation of mandible, maxillule, maxilla, and maxilliped, pedigerous somites and genitoabdomen, in both, females and males.

Argentinochondria patagonensis Etchegoin, Timi et Sardella, 2003 a parasite of smooth kingklip *Genypterus brasiliensis* Reagan, 1903, from Patagonia, Argentina resembles to *B. riograndensis* in having a bulbous head separated from the trunk by a long and slender neck. However, *A. patagonensis* differs from *B. riograndensis* in the presence of a subspherical head, subcylindrical trunk without processes, and in the morphology of two pairs of legs; the first pair being reduced and represented by two small processes whereas the second pair of leg bearing long with two cylindrical rami situated in the trunk, instead of in the neck (Etchegoin *et al*. 2003).

On the other hand, Thatcher and Pereira (2004) compared *B. riograndensis* with both *Pseudolernentoma brasiliensis* Luque et Alves, 2003 and *A. patagonensis*, both genera are parasites of smooth kingklip *Genypterus brasiliensis* (Luque and Alves 2003). Descriptions of these two taxa, which were published almost simultaneously, include diagnostic features that are practically identical. Therefore, according to Principle of Priority of International Code of Zoological Nomenclature (1999), *P. brasiliensis* is herewith regarded as a junior synonymous of *A. patagonensis*.

Furthermore, the geographical distribution of the *B. riograndensis* is broadened, including coastal waters of Buenos Aires Province, Argentina (Mar Chiquita coastal lagoon and Bahía Blanca estuary).

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References

Etchegoin J.A., Timi J.T., Sardella N.H. 2003. *Argentinochondria patagonensis* n. gen., n. sp. (Copepoda: Chondracanthidae) parasitic on *Genypterus brasiliensis* (Pisces: Ophidiidae) from Patagonia, Argentina. *Journal of Parasitology*, 89, 701–704. DOI: 10.1645/GE-3110.

Ho J.S. 1970. Revision of the genera of the Chondracanthidae, a copepod family parasitic on marine fishes. *Beauforita*, 229, 105–218.

International Code of Zoological Nomenclature. 1999. International Trust for Zoological Nomenclature, London.

Kabata Z. 1979. Parasitic Copepoda of British fishes. The Ray Society, London, 468 pp.

Luque J.L., Alves D.R. 2003. *Pseudolernentoma brasiliensis* n. g. sp. (Copepoda: Chondracanthidae) parasitic on *Genypterus brasiliensis* (Osteichthyes: Ophidiidae) from off the state of Rio de Janeiro, Brazil. *Systematic Parasitology*, 56, 195–199. DOI: 10.1023/B:SYPA.0000003806.30680.1b.

Thatcher V.E, Pereira Jr. J. 2004. *Brasilochondria riograndensis* gen. nov., sp. nov. (Copepoda, Chondracanthidae) a parasite of flounders of Rio Grande do Sul State, Brazil. *Revista Brasileira de Zoologia*, 21, 515–518.

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