

PSEUDOBICOTYLOPHORA ATLANTICA N. GEN., N. SP. (MONOGENEA: BICOTYLOPHORIDAE N. FAM.), PARASITE OF TRACHINOTUS SPP. (OSTEICHTHYES: CARANGIDAE) AND REDESCRIPTION OF BICOTYLOPHORA TRACHINOTI.

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SUMMARY: *Pseudobicotylophora atlantica* n. gen., n. sp. is described from the gills of *Trachinotus carolinus* (L., 1766) and from *T. marginatus* Cuvier, 1832 captured at Barra da Lagoa, Florianópolis, State of Santa Catarina, and from *T. carolinus* captured at Itacuruçá and Pedra de Guaratiba, Baía de Sepetiba, State of Rio de Janeiro, Brazil. Other geographical records for *P. atlantica* n. gen., n. sp. from *T. carolinus* are: Florida, USA; Chesapeake Bay, MD, USA; Mexican coast of the Gulf of México; marine tanks in Venezuela; and Baía da Guanabara, coast of Rio de Janeiro, Brazil. Other hosts and localities are: *T. palometa* Regan, 1903, from the coast of Uruguay and *T. rhodopus* Gill, 1863, from the Pacific coast of México. Bicotylophorinae Yamaguti, 1963 is elevated to the family status and the diagnoses of the type genus, *Bicotylophora* Price, 1936, is amended. The genus *Bicotylophora* is characterized by having: 1. the buccal organs with 5-6 loculi, 2. the genital atrium armed with three groups of thin spines (as in *B. trachinoti*), with the blade almost straight, one group central and posterior, and the other two groups bilateral and anterior, without large, hook-like spines or two large, needle-like spines (as in *B. baeri*), with two smaller bundles of needle-like spines, 3. the copulatory organ armed with two bundles of bilateral, thin, needle-like spines (as in *B. trachinoti*) or a pair of large, needle-like spines associated with six (three on each side) smaller, thin, straight spines (as in *B. baeri*), 4. 30-50 testes, and 5. the vagina walls with sclerotized ridges. *Bicotylophora trachinoti* (MacCallum, 1921), is redescribed, based on the type specimens. The new genus *Pseudobicotylophora* is characterized by having: 1. the buccal organs with 4-5 loculi, 2. the genital atrium armed with two groups of thin spines, with the blade almost straight, and two pairs of, dissimilar, large, hook-like spines, 3. the copulatory organ armed with one bundle of thin spines and a pair of similar, hook-like spines, different from those of the genital atrium, 4. approximately 20 testes, and 5. the vagina with two pairs of muscular lobes.

KEY WORDS: Bicotylophoridae, *Bicotylophora trachinoti*, *Pseudobicotylophora atlantica* n. gen., n. sp., Monogenea, *Trachinotus*, South Atlantic Ocean.

INTRODUCTION

MacCallum (1921) described *Dactylocotyle trachinoti* from *Trachinotus carolinus* (L., 1766) of the New York Aquarium, but Price, in the abstract of his Ph. D. Dissertation, proposed the genus *Bicotylophora* for the MacCallum's species. GALLIEN (1937) also addressed the question that MacCallum's species was not a *Dactylocotyle*, but still classified his specimens as *D. trachinoti*.

SPROSTON (1946) listed *B. trachinoti* in the Anthocotylineae Monticelli, 1903 and YAMAGUTI (1963)

erected the subfamily Bicotylophorinae to accommodate the species. Other reports with misidentification of *B. trachinoti* include: HARGIS (1956) from *T. carolinus*, from Florida, USA; McMAHON (1963) from *T. carolinus*, from the Chesapeake Bay, USA; CABALLERO & BRAVO-HOLLIS (1965) from *T. carolinus*, from the Mexican coast of the Gulf of México, México; MAÑÉ-GARZÓN & HOLCMAN-SPECTOR (1968) from *T. palometa* Regan, 1903 (= *T. goodei* Jordan & Evermann, 1896), from the coast of Uruguay; BRAVO-HOLLIS (1984, 1986) from *T. carolinus*, from the Gulf of México and from *T. rhodopus*

Gill, 1863, from the Pacific coast of México, México, respectively; NASIR & FUENTES ZAMBRANO (1983), from *T. carolinus*, from marine tanks in Venezuela; and KOHN *et alii* (1992), from *T. carolinus*, from Baía da Guanabara, coast of the State of Rio de Janeiro, Brazil. EUZET & WAHL (1977) described *B. baeri* from *T. falcatus* (L., 1758) using material collected by Wahl in the Ivory Coast and reported by BAER (1972) as *B. trachinoti*. In 1977 and 1978, I collected bicotylophorid monogeneans from *T. carolinus* and from *T. marginatus* Cuvier, 1832, in southern Brazil. Later, in 1990, more of these monogeneans were collected from *T. carolinus* at Itacuruçá and Pedra de Guaratiba, Baía de Sepetiba, RJ, Brazil. The study of the material collected by MacCallum (deposited at the USNM, Beltsville, MD), showed unique characteristics not recognized in any group of specimens identified as *B. trachinoti* by all subsequent authors who thought they had at hands the species of MacCallum.

MATERIALS AND METHODS

The Brazilian material used to describe *P. atlantica* n. gen., n. sp. was collected from *T. carolinus* and *T. marginatus* captured from the surrounding waters of the Island of Santa Catarina, at Barra da Lagoa, Florianópolis, SC, Brazil (27 °S, 48 °W), during June 1977 and January 1978, and from *T. carolinus* at Itacuruçá and Pedra de Guaratiba, Baía de Sepetiba, State of Rio de Janeiro (23 °S, 44 °W), from March to July of 1990. Gills were excised, placed in a jar with formaline solution 1:4000 and shaken 50 times (PUTZ & HOFFMAN, 1966). One hour later the contents of the jar were sieved through a mesh of 37 µm (154 µm for the Baía de Sepetiba material), and the gills were examined under a dissecting microscope. Parasites from Barra da Lagoa were fixed in AFA, stored in 70 °GL (Gay Lussac) ethyl alcohol, stained in Langeron's carmine, cleared in beechwood creosote, and mounted in Canada balsam. The specimens from Itacuruçá and Pedra de Guaratiba were cleared in Grey & Wess medium or stained with Gomori's trichrome and mounted in Canada balsam. Measurements are in micrometers unless otherwise indicated and the average follows the range between parentheses; figures were drawn with the aid of a drawing tube. The nomenclature of the sclerites of the clamps follow EUZET & SURIANO (1975). The following helminth collections were used for borrowing and/or deposition of type specimens: United States National Museum (USNM), Harold W. Manter Laboratory (IHWM), Virginia Institute of Marine Sciences (VIMS), and Universidad Nacional Autónoma de México (UNAM).

RESULTS

Bicotylophoridae Yamaguti, 1963 status amended

DIAGNOSIS: 1. Haptor symmetrical, bilobed; each lobe with four sessile clamps 2. Clamps similar in size, without accessory sclerites 3. Haptoral appendix not present in adults. Intestinal ceca with diverticula, bifurcating before entering haptor 4. Testes numerous 5. Copulatory organ muscular, armed 6. Genital atrium with bilaterally symmetrical armature of spines of different sizes 7. Ovary curved, elongate 8. Vagina single, opening middorsal; walls with sclerotized ridges or muscular lobes 9. Eggs with abopercular, polar filament 10. Parasites of marine teleosts.

Bicotylophora Price, 1936 amended

DIAGNOSIS: 1. Buccal organs with 5-6 loculi, 2. Genital atrium armed with three groups of thin spines, with the blade almost straight; one group central and posterior, and the other two groups bilateral and anterior, without large, hook-like, spines or two large, needle-like spines with two smaller bundles of needle-like spines, 3. Copulatory organ armed with two bundles of bilateral, thin, needle-like spines (as in *B. trachinoti*) or a pair of large, needle-like spines associated with six (three on each side) smaller, thin, straight spines (as in *B. baeri*), 4. 30-50 testes, and 5. Vagina walls with sclerotized ridges, opening middorsal.

Taxonomic summary

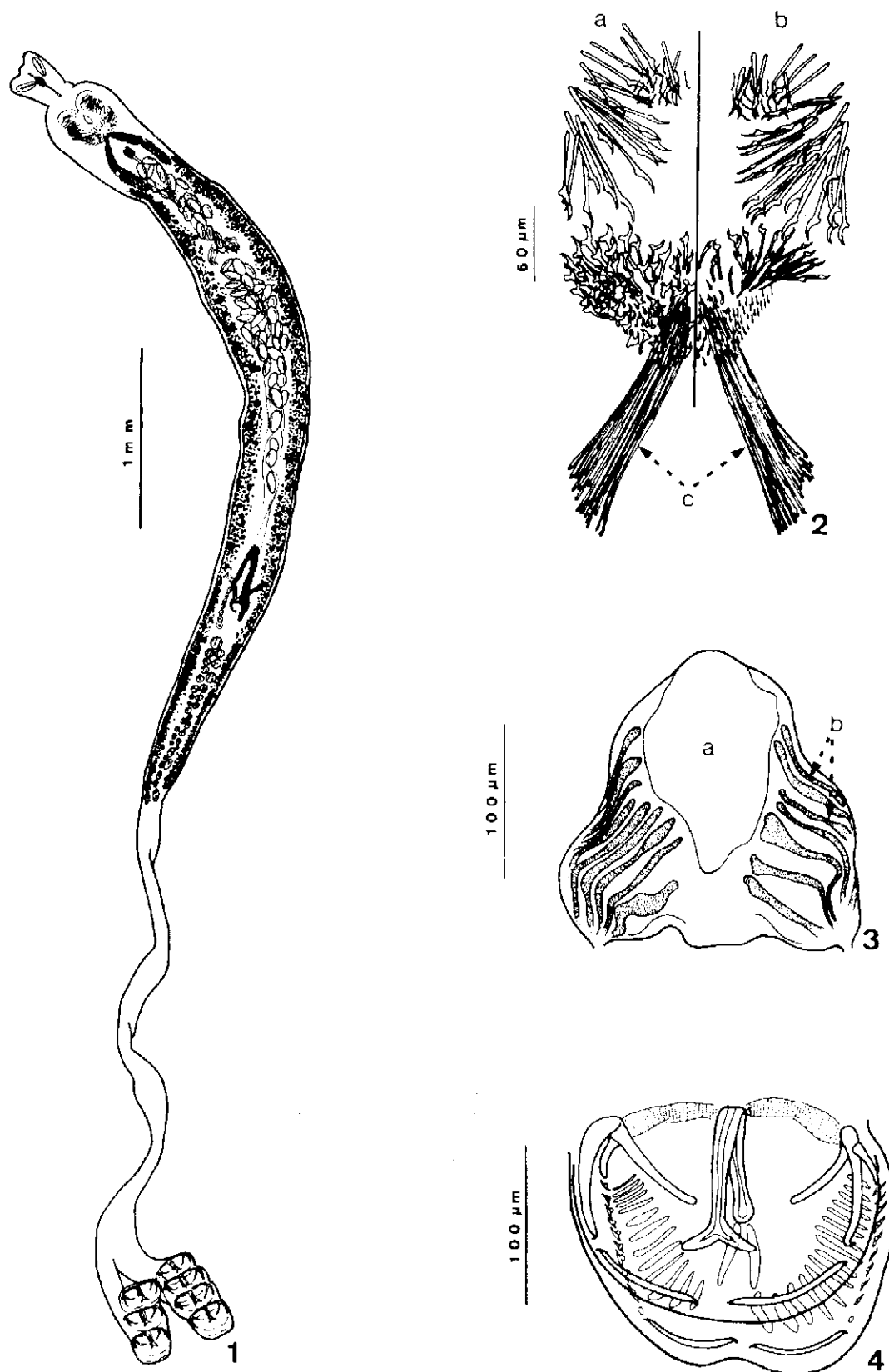
Type species: *Bicotylophora trachinoti* (MacCallum, 1921) Price, 1936.

Other species: *Bicotylophora baeri* Euzet & Wahl, 1977

Bicotylophora trachinoti (MacCallum, 1921) Price, 1936 amended.

(Figs. 1-4)

REDESCRIPTION (based on the MacCallum's specimens USNM N's 35612-b, 35613-b, 35614, and 35112-e) Bicotylophoridae n. fam. Body slender (Fig. 1), 5.45-12.96 mm (9.20 mm) long; maximum width at level of vagina, 472-756 (614); haptor 607-769 (688) long, 229-810 (520) wide. Clamps (Fig. 10) with single mid-sclerite (Ma - in anterior half; Mp - in posterior half); distal extremity of Ma bifid, as a T; distal extremity of Mp with two, slightly sclerotized appendages, with a V-shape, marginal sclerites different in anterior and posterior halves; anterior half with marginal, distal sclerites (Al2 and As2) smaller than marginal, proximal sclerites (Al1 and As1); marginal, proximal sclerites longer and bent towards mid-sclerite; posterior half with complex, proximal, marginal sclerites (Pl1 and Ps1) fragmented in 9-11 smaller sclerites; distal, marginal sclerites (Pl2 and Ps2) not fragmented; posterior



Figs. 1 - 4. *Bicotylophora trachinoti*, holotype. 1. Adult, ventral view. 2. Genital atrium armature: a. armature of the dorsal inner wall; b. armature of the ventral inner wall; c. armature of the copulatory organ. 3. Vagina, holotype: a. vaginal opening; b. sclerotized ridges. 4. Clamp, holotype, anterior view.

half with large ribs. First pair of clamps 180-216 (198) long, 260-310 (285) wide; 2nd pair 160-243 (201) long, 304-378 (341) wide; 3rd pair 200-243 (221) long, 260-364 (312) wide; 4th pair 212-270 (241) long, 260-324 (292) wide. Buccal organs two, 13-18 (15.5) long, 5-7 (6) wide, each with four septa, five loculi. Mouth anterior, prepharynx short; pharynx 6-11 (8.5) long, 5-8 (6.5) wide; intestinal ceca with ramifications toward intercecal region. Testes 30-50, in number; copulatory organ armed with two bundles of bilateral, thin, needle-like spines; genital atrium large, with complex armature (Fig. 2): with three groups of thin spines, with the blade almost straight; one group central and posterior, the other two groups bilateral and anterior; each bilateral and anterior group formed by, approximately, 25 hook-like spines with large, twisted handles, approximately, three times longer than blade, points directed towards center of genital atrium, tending to diminish in size anteriorly; in anterior area, on both bilateral groups of spines there are a group of approximately 20, tiny, hook-like spines; the central and posterior group formed by more than 300 dorsal and ventral hook-like spines of different sizes and shapes, increasing in size anteriorly, handles not twisted, points directed toward center of genital atrium; lateral areas of the central and posterior group of spines with two bundles of approximately 20, tiny, twisted, needle-like spines with fine points directed towards center of atrium, of same size, shape. Ovarian region 24-89 (56.5) long, uterus pre-ovarian; vagina with opening middorsal, located at end of first fifth of body length, opening large, with, approximately, ten, sclerotized ridges (Fig. 3) in each side; vitellaria extending laterally, over ceca, from base of copulatory organ to last testis; eggs 140-160 (150) long, 76-90 (83) wide, with long, abopercular, polar filament.

Taxonomic summary

Type host: *Trachinotus carolinus* (L., 1766), Carangidae.

Site of infestation: gills.

Type locality: New York Aquarium, New York, NY. So far unrecorded from natural fish populations.

Specimens studied: holotype USNM N° 35613-b, with the label: pg. 87-10, 58B, *Dactylocotyle*, gills, *Trachinotus carolinus*, pompano, N. Y. Nov. 22/1917; paratype USNM N° 35112-e, with the label: 1570, *Dactylocotyle trachinoti*, gills, *Trachinotus carolinus*, pompano, N. Y., February 27, 1917; USNM N° 35614, with the label: pg. 87-1-1248 or 583, *Dactylocotyle*, gills, *Trachinotus carolinus*, pompano, ? April 27, 1915; paratype USNM N° 35612-b, with the label: pg. 9-1, 584, *Dactylocotyle denticulatum*, gills of the striped bass, N. Y.

Remarks

EUZET & WAHL (1977) characterized the wall of the

vagina of *B. baeri* as: "épaisse plissée, légèrement sclérifiée dans sa moitié postérieure", i. e. pleated walls, thicker in the posterior half of the vagina. Although these authors did not draw the vagina of *B. baeri*, it is clear from their description that their specimens had sclerotized ridges in the walls of the vagina.

Pseudobicotylophora trachinoti differs from *P. baeri* by the 1. armature of the copulatory organ, which in *P. trachinoti* is formed by two, bilateral, bundles of 25, thin, acicular spines and in *P. baeri* is reduced to six, thin, acicular spines and two long, thin spines, almost twice the length of the six, smaller, acicular spines; and by the 2. single, posterior group of thin spines of the genital atrium armature, which in *B. trachinoti* is formed by hook-like spines, while in *B. baeri* these spines are acicular and thin, without the typical handle, thumb, and blade, at least as shown by EUZET & WAHL (1977), by the 3. body shape which is longer and thinner; and by the 4. anterior distribution of the vitellaria, which in *P. trachinoti* reaches only the base of the copulatory organ and in *P. baeri* reaches the level of the genital atrium.

An interesting observation was that the holotype of *B. trachinoti* showed one side of the haptor with only three clamps. It was not possible to determine, from the mounted specimen, if this was a teratological condition or the specimen lost one clamp during the process of staining and mounting.

Pseudobicotylophora n. gen.

DIAGNOSIS: 1. Buccal organs with 4-5 loculi, 2. Genital atrium armed with two groups of thin spines, with blades almost straight, and two pairs of, dissimilar, large, hook-like spines, 3. Copulatory organ armed with one bundle of thin spines and a pair of hook-like spines, different in shape from those of the genital atrium, 4. Approximately, 20 testes, and 5. Vagina with two pairs of muscular lobes.

Taxonomic summary

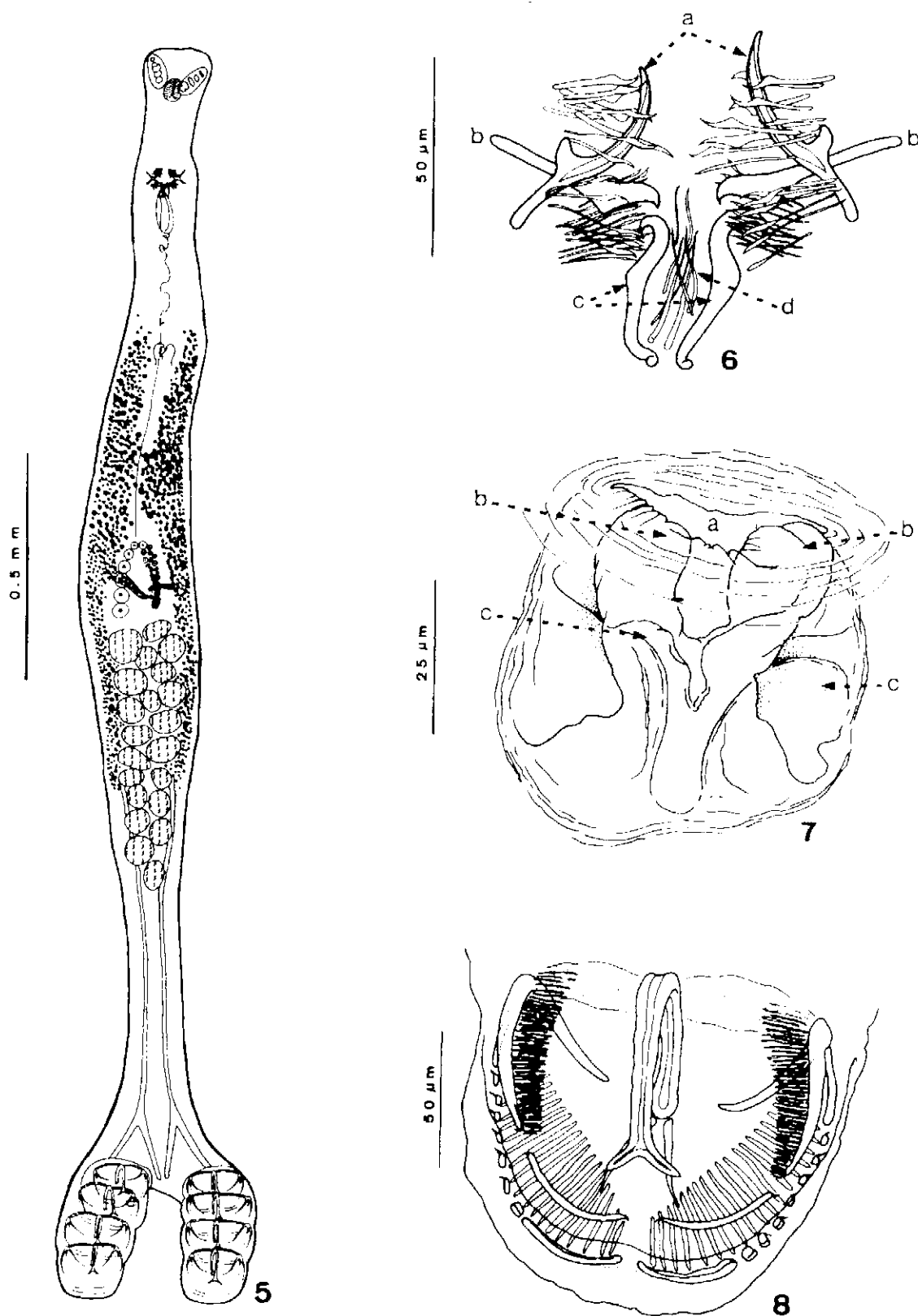
Type species: *Pseudobicotylophora atlantica* n. sp.

Etymology: the generic name, *Pseudobicotylophora*, refers to the many instances in which the single species of the new genus has been misidentified as *Bicotylophora*.

Pseudobicotylophora atlantica n. sp.

(Figs. 5-10)

DESCRIPTION (based on 46 whole mounts, from Barra da Lagoa, Florianópolis, and 15 specimens from Itacuruçá and Pedra de Guaratiba, Baía de Sepetiba). Bicotylophoridae n. fam.: Body elongate (Fig. 5), 3.40-4.32 mm (3.86 mm) long, 337-459 (398) wide at the level of ovary. Haptor 459-621 long (540), 513-611 (562) wide. Clamps with single mid-sclerite (Ma - in anterior half, Mp - in posterior



Figs. 5 - 8. *Pseudobicotylophora atlantica* n. gen., n. sp. 5. Adult, ventral view, holotype. 6. Genital atrium armature, paratype: a. first pair of hook-like spines, with long blades; b. second pair of spines, with short blades; and armature of the copulatory organ: c. large, twisted hook-like spines, with bent blades; d. single bundle of acicular spines. 7. Vagina, paratype: a. vaginal opening; b. pair of large, muscular lobes; c. pair of small, muscular lobes. 8. Clamp, paratype, anterior view.

half); distal extremity of Ma bifid, as a T; distal extremity of Mp with two, slightly sclerotized appendages, forming a V; marginal sclerites different in anterior and posterior halves: anterior half with marginal, distal sclerites (Al2 and As2) smaller than marginal, proximal sclerites (Al1 and As1); marginal, proximal sclerites longer and bent towards mid-sclerite; posterior half with complex, marginal, proximal sclerites (Pl1 and Ps1) fragmented in 7-8 smaller sclerites; distal, marginal sclerites (Pl2 and Ps2) not fragmented. Anterior half with short, thin ribs; posterior half with longer, wider ribs. First pair of clamps 138-243 (190.5) long, 204-310 (257) wide; 2nd pair 122-337 (229.5) long, 228-351 (289.5) wide; 3rd pair 155-270 (212.5) long, 244-283 (263.5) wide; 4th pair 179-283 (231) long, 212-337 (274.5) wide. Haptoral appendix present in young, absent in fully developed specimens; one pair of "crochet en fléau" (Fig. 9a); "crochet en fléau" with hook-like distal end, tapering proximally; one pair of hooks (Fig. 9b); hooks with erected guard, evenly curved blade, short point, long handle, filamentous hook (FH) loop 1/2 of hook length; one pair of anchors (Fig. 9c); anchors with long point, straight blade with distal portion thinner than proximal portion, long roots. Buccal organs 108-120 (114) long, 60 wide. Mouth anterior; prepharynx short; pharynx 80-88 (84) long, 60 wide; intestinal ceca without intercecal ramifications; ceca bifurcating near haptor, extracecal rami entering haptor. Testes 20-24, in number, post-ovarian; largest testis usually round, located anteriormost, 88-96 (92) long, 72-120 (96) wide; copulatory organ inconspicuous, armed with few, thin, needle-like spines forming one central bundle and two large, hook-like spines with shape different than those of the genital atrium; points bent backwards, handles twisted; blades, handles equal, 52-80 (66) long, 10-12 (11) wide. Genital atrium large (Fig. 6), armature complex, including two pairs of large, dissimilar, hook-like spines, and approximately, 20 small, hook-like spines; antero-lateral pair of hook-like sclerites large, with blade longer than handle; handle not twisted, directed anteriorly, 70-80 (75) long, 16-20 (18) wide; second pair of hook-like sclerites posterolateral with blade smaller than handle; handle not twisted, directed posteriorly, 64-74 (69) long, 14-18 (16) wide; small, hook-like sclerites similar, 36-50 (43) long. Ovarian region 204-367 (285.5) long; uterus pre-ovarian; vagina middorsal, with one large, two small muscular lobes (Fig. 7); vitellaria lateral, over intestinal ceca, from level of vagina to near level of two thirds of testes' distribution, with small follicles of different sizes, largest follicles 24-32 (28) long, 20-36 (28) wide; eggs 140-144 (142) long, 52 wide; operculated, with long, abopercular, polar filament.

Taxonomic summary

Synonyms: *Bicotylophora trachinoti* of HARGIS (1956), of

McMAHON (1963), of CABALLERO & BRAVO-HOLLIS (1965), of MAÑÉ-GARZÓN & HOLCMAN-SPECTOR (1968), of BRAVO-HOLLIS (1984, 1986), of NASIR & FUENTES ZAMBRANO (1988), and of KOHN *et aln* (1992).

Type host: *Trachinotus carolinus* (L., 1766), Carangidae.

Other hosts: *Trachinotus marginatus* Cuvier, 1832, *T. palometa* Regan, 1903, and *T. rhodopus* Gill, 1863.

Type locality: Barra da Lagoa, Florianópolis, State of Santa Catarina, Brazil.

Other localities: Itacuruçá and Pedra de Guaratiba, Baía de Sepetiba, RJ, Brazil; coast of Uruguay; Mexican coast of Gulf México; Pacific coast of México; Chesapeake Bay, MD; marine tanks in Venezuela; Baía de Guanabara, RJ, Brazil.

Site of infestation: gills.

Type specimens: holotype USNM N° 81809, paratypes USNM N°s 81810, and 81811, paratypes IHWML N°s 33410, 33411, 33412, 33413, and 33414.

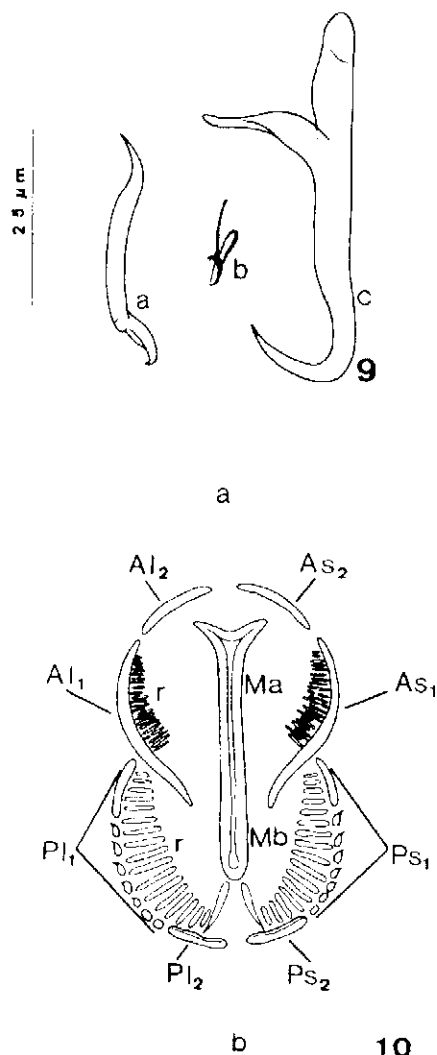
Geographical distribution: Western Atlantic Ocean — from Chesapeake Bay, MD to Montevideo, Uruguay, including marine tanks in Venezuela; Eastern Pacific Ocean — coast of México.

Etymology: the specific name, *atlantica*, refers to the generic name of the host.

Specimens examined: the following specimens of *P. atlantica* n. sp. identified as *B. trachinoti* were examined: from México - CABALLERO & BRAVO-HOLLIS (1965); UNAM N°s 219-2-20 and 291-20-7 from *T. carolinus* from Tuxpan, Veracruz; from the USA - HARGIS (1956), VIMS N°s H-390-1 up to H-390-19, with a total of 57 specimens, from Alligator Harbor, Franklin Co., Florida, Gulf of México; VIMS N°s H 1105-1 up to H 1105-7 from Tampa Bay, Penellas Co., Florida, Gulf of México, all from *T. carolinus*, collected in 1953; McMAHON (1963); VIMS N°s A-82-1 up to A-82-8 and A-82-10 to A-82-14 with 13 specimens, collected from *T. carolinus* at Cape Henry, Virginia, Chesapeake Bay, 1957 and VIMS N°s B-24-1 up to B-24-3 and B-24-5 to B-24-7, collected at Ocean View, Norfolk, Virginia, Chesapeake Bay, 1957, with six specimens. OVERSTREET (not published); collected this species from *T. carolinus* at Buttler Beach, Florida, USA, in 1968 and from Baldwin Co., AL, USA.

Remarks

The new genus *Pseudobicotylophora* differs so much from *Bicotylophora* that it is remarkable that none of the previous authors who had the opportunity to study specimens did not see, at least, one difference. The armature of the genital atrium with the two large pairs of hook-like spines, is the first obvious difference. The armature of the copulatory



Figs. 9 - 10. *Pseudobicotylophora atlantica* n. gen., n. sp., paratype. 9. Armature of the haptor, paratype. a. "Crochet-en-fléau," b. Hook. c. Anchor. 10. Open clamp, diagrammatic: a. anterior half - Al₁ and As₁: anterior, lateral, proximal sclerites; Al₂ and As₂: anterior, distal sclerites; Ma: anterior half of the median sclerite; b. posterior half - Pl₁ and Ps₁: posterior, lateral, proximal sclerites; Pl₂ and Ps₂: posterior, distal sclerites; r. ribs: smaller in anterior half and larger in posterior half; Mb: posterior half of the median sclerite.

organ is another. The vagina with two pairs of muscular lobes and without any sclerotized ridges also calls attention. In addition to the generic character differences, *P. atlantica* n. gen., n. sp. is the species with shorter vitellaria distribution, which reaches, anteriorly, the level of the vagina. The region between the vagina and the pharynx appears as an "empty" space taken only by the genital atrium, the copulatory organ, and the uterus with the eventual eggs. When the uterus is full of eggs, it is difficult to see anything else. This contrasts with both species in *Bicotylophora*. In the genital atrium the large, hook-like

spines contrast with the genital atrium armature of both species in *Bicotylophora*.

The fragments of the lateral, proximal sclerites of the posterior half of the clamps are in smaller numbers (7) in *P. atlantica* n. gen., n. sp., but, in this respect, agree with *B. baeri*. The testes in *P. atlantica* n. gen., n. sp. are larger and in smaller numbers than in both species in the genus *Bicotylophora*.

When specimens of *P. atlantica* n. gen., n. sp. are compared with the specimen illustrated by NASIR & FUENTES ZAMBRANO (1983), it is clear that they belong to the genus *Pseudobicotylophora*, now proposed as new. But, when one compares the distribution of the vitellaria, a doubt arises, as the vitellaria, in *P. atlantica* n. gen., n. sp., reach, anteriorly, the level of the vagina, and in the specimens from Venezuela the vitellaria reach the level of the body equator, almost in line with the most proximal uterine eggs. The testes in the Venezuelan specimens reach, posteriorly, the limit between body proper and the haptor, while in my specimens the posterior distribution of the testes is always very far away from the haptor. Because NASIR & FUENTES ZAMBRANO (1983) did not draw the complex armatures of the genital atrium and that of the copulatory organ and because I have not had the opportunity to examine the specimens from Venezuela, it is not possible, at the present time, to present a proposition that these specimens represent the second species of *Pseudobicotylophora* n. gen. This will, probably, be possible to do after the thorough study of these specimens collected from captive *T. carolinus* in marine fish tanks in Venezuela.

I wrote to Dr. Mañé-Garzón trying to borrow the specimens of *B. trachinoti* (= *P. atlantica* n. gen., n. sp.) studied by MAÑÉ-GARZÓN & HOLCMAN-SPECTOR (1965) from the coast of Uruguay, but did not receive a reply. The evaluation of the characters of the specimens studied by these authors, from the coast of Uruguay, has been, solely, based on their published account.

DISCUSSION

The elevation of Bicotylophorinae to the status of family proposed herein is supported by shared and unique characters of this taxon. Evolutionary proximity of bicotylophorids and members of the suborder Microcotylina Lebedev, 1972 (*sensu* LEBEDEV, 1988) is suggested by the following shared characters: 1. armed genital atrium; 2. general morphology of clamps; and 3. absence of a haptor appendix in fully developed specimens. However, the diagnoses of families previously considered within Microcotylina do not allow inclusion of

species with symmetrical haptor and only four pairs of clamps. Members of Bicotylophoridae n. fam. can be easily identified by the bilobed morphology of their haptors. HARGIS (1956) did not describe or figure the monogeneans collected from *T. carolinus*, and it was not possible for YAMAGUTI (1963), to know that these were completely different from the type specimens of *B. trachinoti* he had examined (USNM Nº 35112).

McMAHON (1963) redescribed *B. trachinoti* using the specimens of Hargis and additional specimens collected from *T. carolinus* from Chesapeake Bay, but he did not indicate having examined the specimens of MacCallum. The posterior confluence of the vitellaria does not occur in either *Bicotylophora* or *Pseudobicotylophora* and, cannot be considered as a specific character as implied by this author.

The same bicotylophorid species (identified herein as *P. atlantica* n. gen., n. sp.) of HARGIS (1956) and McMAHON (1963) was reported by CABALLERO & BRAVO-HOLLIS (1965), by MAÑÉ-GARZÓN & HOLC'MAN-SPECTOR (1968), by BRAVO-HOLLIS (1984, 1986), by NASIR & FUENTES ZAMBRANO (1983), and by KOHN *et alii* (1992). None of these reports indicated a comparison with the type-specimens collected by MacCallum. The specimens from Barra da Lagoa, in Florianópolis, SC, southern Brazil, and from Itacuruçá and Pedra de Guaratiba, Baía de Sepetiba, RJ, although coming from *T. carolinus* and *T. marginatus*, are very similar to all of these specimens, all showing a completely different armature of the genital atrium, configuration of the vagina, and the posterior distribution of the vitellaria, when compared with MacCallum's *B. trachinoti*.

The second species of *Bicotylophora*, *B. baeri* from the eastern Atlantic Ocean, appears to be the sister group of *B. trachinoti*. The two bundles of needle-like spines of similar size in the copulatory organ of *B. trachinoti*. Also, species of *Bicotylophora* bear more than three pairs of hook-like spines as observed in *P. atlantica* n. gen., n. sp. The large center area of the genital atrium is shown by EUZET & WAHL (1977) to have needle-like spines instead of hook-like spines as in *B. trachinoti* due to the French authors stated that they were able to examine the Mexican material and the American material, however, they must have referred to the material of HARGIS (1956) and McMAHON (1963) which are *P. atlantica* n. gen., n. sp. and not to the material of MacCallum, which is *B. trachinoti*. When *B. baeri* is compared to *P. atlantica* n. gen., n. sp., it is apparent that the species belong to different genera mainly based on the genital atrium armature.

Pseudobicotylophora atlantica n. gen., n. sp. although collected mainly from *T. carolinus*, shows small differences

when infrapopulations from different localities are compared. The specimens from the North Atlantic Ocean appear to be more stout than those from *T. marginatus* from southern Brazil and those from *T. palometa* from the coast of Uruguay, as reported by MAÑÉ-GARZÓN & HOLC'MAN-SPECTOR (1968). In addition, specimens from the North Atlantic Ocean (Hargis; McMahon; Caballero & Bravo-Hollis) have fewer small fragments of the lateral, proximal sclerites while those collected from *T. carolinus* in Brazil have larger number of fragments and smaller eggs. The morphology and number of sclerites in the clamps may, in the future, be looked upon as a valuable character to separate species of *Pseudobicotylophora* n. gen.

Finally, MacCallum's species has never been found and reported from natural fish populations and, up to the present, had never been fully described. They are the only specimens of *B. trachinoti* known to date.

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SUMÁRIO

Pseudobicotylophora atlantica n. gen., n. sp. é descrita parasitando brânquias de *Trachinotus carolinus* (L., 1766) e de *T. marginatus* Cuvier, 1832 capturados em Barra da Lagoa, Florianópolis, Estado de Santa Catarina, e de *T. carolinus*, em Itacuruçá e em Pedra de Guaratiba, Baía de

Sepetiba, Estado do Rio de Janeiro, Brasil. Outras localidades de onde outros autores coletaram *Pseudobicotylophora atlantica* n. gen., n. sp. parasitando *T. carolinus* mas a identificaram como *B. trachinoti*: Chesapeake Bay, MD, EUA, da costa Mexicana do Golfo do México, de tanques de criação na Venezuela e da costa do Estado do Rio de Janeiro, Brasil. Outros hospedeiros e outras localidades para a espécie nova também identificada como *B. trachinoti* são: *T. palometa* Regan, 1903 da costa do Uruguai e *T. rhodopus* Gill, 1863, da costa do Pacífico do México. Bicytlophorinae Yamaguti, 1963 é elevada ao nível de família e a diagnose do gênero-tipo, *Bicytlophora* Price, 1936, é emendada. O gênero *Bicytlophora* é caracterizado por ter: 1. os órgãos bucais com 5-6 lóculos, 2. o átrio genital armado com três grupos de escleritos finos, com a lâmina quase reta: um grupo central e posterior, os dois outros grupos bilaterais e anteriores, sem escleritos grandes em forma de foices (como em *P. atlantica* n. gen., n. sp.) ou dois grandes escleritos em forma de agulhas, ladeados por dois grupos de escleritos aciculares mais finos (como em *B. baeri*), 3. o órgão copulador armado com dois feixes bilaterais de escleritos aciculares (como em *B. trachinoti*) ou um par de grandes escleritos aciculares associados com seis (três de cada lado) escleritos menores, mais finos, retos (as in *B. baeri*), 4. 30-50 testículos, e 5. as paredes da vagina com cristas esclerotizadas. *Bicytlophora trachinoti* (MacCallum, 1921) é redescrita com base no holótipo e em parátipos. O novo gênero *Pseudobicotylophora* é caracterizado por ter: 1. os órgãos bucais com 4-5 lóculos, 2. o átrio genital armado com dois grupos de escleritos finos, com as lâminas quase retas, e dois pares de grandes escleritos, dissimilares, em forma de foice, 3. o órgão copulador armado com um feixe central de escleritos finos e um par de escleritos em forma de gancho, diferentes daqueles do átrio genital, 4. aproximadamente 20 testículos, e 5. a vagina com dois pares desiguais de lóbulos musculares.

PALAVRAS-CHAVE: Bicytlophoridae, *Bicytlophora trachinoti*, *Pseudobicotylophora trachinoti* n. gen., n. sp., Monogenea, *Trachinotus*, Oceano Atlântico Sul.

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