

## New species of *Chauhanellus* (Monogenoidea, Platyhelminthes) from the gills of Southern Atlantic marine catfishes (Siluriformes, Ariidae) of the Neotropical region

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### Abstract

Two new species of *Chauhanellus* Bychowsky & Nagibina, 1969 (Dactylogyridae: Ancyrocephalinae) are described from the gills of marine catfishes from the Southwestern Atlantic: *Chauhanellus neotropicalis* n. sp. from *Aspistor luniscutis* (Valenciennes, 1840), and *Chauhanellus boegeri* n. sp. from *Genidens barbatus* (Lacepède, 1803) and *Genidens genidens* (Cuvier, 1829). This is the first report of species of *Chauhanellus* in the Atlantic waters and the Neotropical region.

**Key words:** Monogenoidea, Dactylogyridae, Ancyrocephalinae, *Chauhanellus neotropicalis* n. sp., *Chauhanellus boegeri* n. sp., Siluriformes, *Aspistor luniscutis*, *Genidens barbatus*, *Genidens genidens*.

### Introduction

The Ariidae is composed by approximately 153 species of fishes. Members of this family inhabit mainly marine environments of the subtropical and tropical seas, although many species occasionally enter or are restricted to freshwater. Few species of Monogenoidea have been recorded from marine catfishes of the Neotropics. In a recent revision, Kohn & Paiva (2000) reported only three species as parasites of South American marine catfishes: *Fridericianella ovicola* Brandes, 1894 (Calceostomatidae) from the eggs of *Genidens barbatus* (Lacepède, 1803) [= *Arius commersonii* (Lacepède, 1803)], Rio Grande do Sul, Brazil; *Neomurraytrematoides proops* Fuentes & Ochoa, 1993 (Dactylogyridae) from the gills of *Hexanematichthys proops* (Valenciennes, 1840) [= *Arius proops* (Valenciennes,

1840)], Isla de Margarita, Venezuela; and *Hamatopeduncularia* sp. (Ancyrocephalinae) from the gills of *Galeichthys peruanus* Lütken, 1874, from the central coast of Peru.

During a study of gill parasites from marine catfishes of the Southwestern Atlantic in Brazil, two new species of *Chauhanellus* Bychowsky & Nagibina, 1969 were found: *Chauhanellus neotropicalis* n. sp. from *Aspistor luniscutis* (Valenciennes, 1840), and *Chauhanellus boegeri* n. sp. from *Genidens barbatus* (Lacepède, 1803) and *G. genidens* (Cuvier, 1829). These species are described herein. Lim *et al.* (2001) recognized 22 valid species of *Chauhanellus* parasitizing siluriform fishes of the Indian and Pacific Oceans. The two new species represent the first report of species of *Chauhanellus* in the Atlantic waters and the Neotropical region.

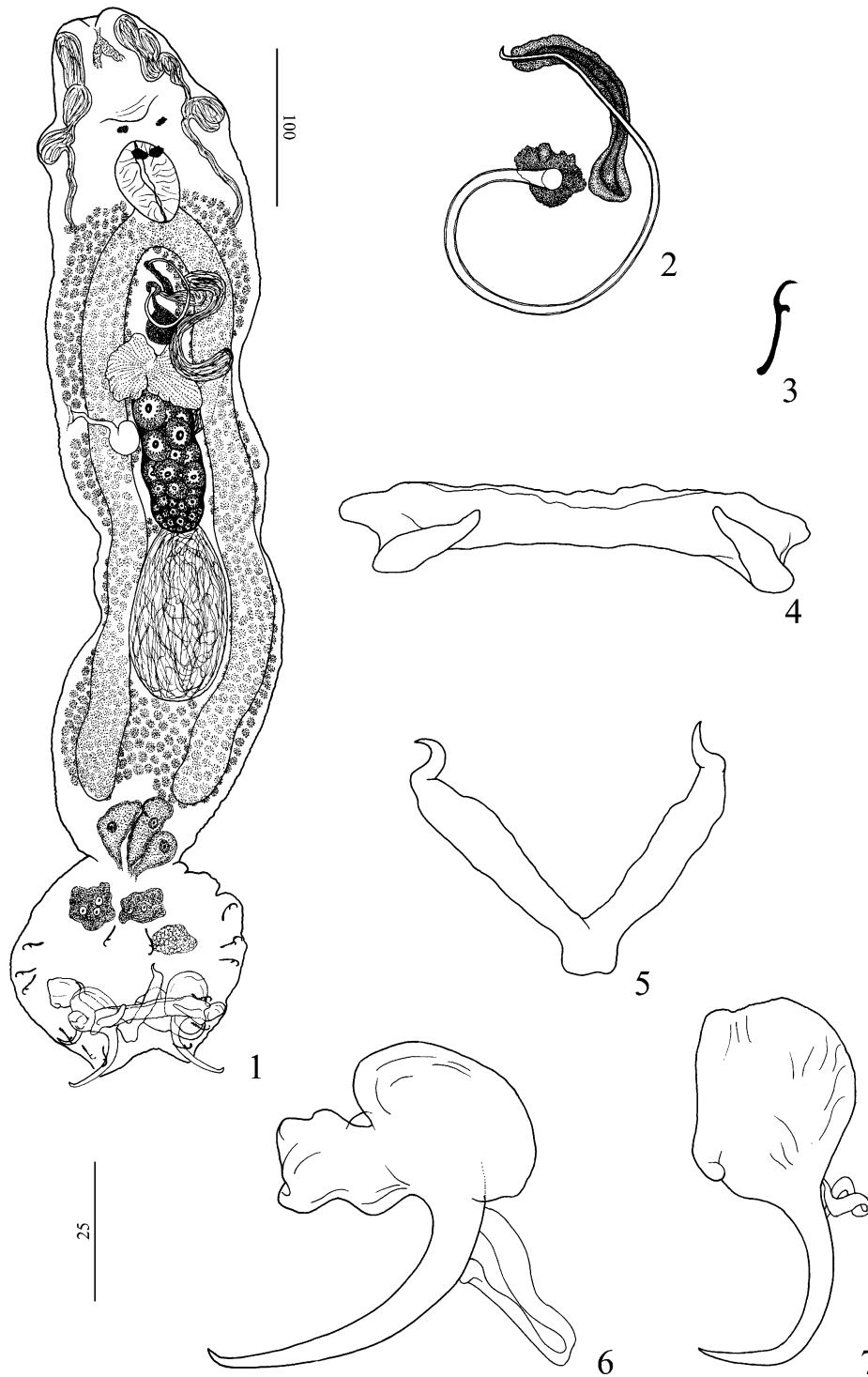
### Materials and methods

Hosts were collected with gill nets from southeastern Brazil in the following localities: Baía de Guaratuba, Municipality of Guaratuba, State of Paraná (25°52'16.73"S 48°39'07.32"W), during 1994 and 1998; some specimens were purchased at fish markets in the Municipality of Paranaguá, during 1996. Gill arches were removed and placed in vials containing 1:4,000 formalin solution. After one hour, each vial was vigorously shaken and formalin was added to obtain a 5% solution. In the laboratory, the contents of each vial were examined under a dissecting microscope. Some specimens were stained with Gomori's trichrome and others were mounted in Hoyer's mounting medium or Gray & Wess medium (Humason 1979). The measurements, all in micrometers, were realized according to the procedures of Mizelle & Klucka (1953). Dimensions of organs and other structures represent the greatest measurement in dorsoventral view; lengths of curved or bent structures (anchors, bars, accessory piece) represent the straight line distances between extreme ends. The average measurement is followed by the ranges and the number (n) of specimens measured in parentheses. Illustrations were prepared using a camera lucida attached to a phase-contrast or differential interference contrast microscope. Type-specimens and vouchers are deposited in the parasite collections of Coleção Helmintológica do Museu de Zoologia da Universidade de São Paulo (MZUSP) São Paulo, State of São Paulo, Brazil; Coleção Helmintológica do Instituto Oswaldo Cruz, Rio de Janeiro, State of Rio de Janeiro, Brazil (CHIOC); and the U.S. National Parasite Collection (USNPC), Beltsville, Maryland, USA, as indicated in the respective descriptions.

**Results****Dactylogyridae Bychowsky, 1933****Ancyrocephalinae Bychowsky, 1937*****Chauhanellus neotropicalis* n. sp.**

(Figs 1–7)

**Type-host and type locality:** *Aspistor luniscutis* (Valenciennes, 1840)**Site:** Gills.**Type-locality:** Fish market, Municipality of Paranaguá, State of Paraná, Brazil (1996).**Specimens deposited:** Holotype, MZUSP 6357; 8 paratypes, CHIOC 36823 a–b, MZUSP 6358 a–d, USNPC 98921.**Etymology:** The specific name is related to the first record of *Chauhanellus* for the marine Neotropical region.**Description** (based on 9 adult specimens): Body 680 (n=1) long, fusiform, greatest width 131 (122–139; n=2) usually at level of germarium. Tegument smooth. Cephalic lobes moderately developed; three pairs of head organs; cephalic glands posterolateral to pharynx. Eyes 4; posterior pair slightly larger and closer than anterior pair; accessory granules absent in cephalic area. Mouth subterminal, midventral; pharynx ovate, 39 (36–43; n=2) in diameter; esophagus short; intestinal ceca two, nonconfluent, lacking diverticula. Haptor subspherical, 113 (108–118; n=2) long, 128 (113–144; n=2) wide. Anchors dissimilar; ventral anchor 54 (50–60; n=7) long, base 43 (30–50; n=7) wide, robust, with truncate superficial root, deep root expanded into wings, recurved shaft, short slightly recurved point. Dorsal anchor 62 (55–66; n=7) long, base 30 (26–35; n=7) wide, robust, with inconspicuous superficial root, expanded deep root, evenly curved shaft and point; anchor spine blunt. Ventral bar 9 (n=2) long, 73 (72–74; n=2) wide, posterior ends with foot-like protuberances for articulation with ventral anchors. Dorsal bar, V-shaped, with spines on both ends, elongate posteromedial process. Hooks similar in shape, 16 (14–17; n=14) long, with erect thumb, evenly curved, shaft, point, shank without inflation, filamentous hook loop (FH loop) about half shank length. Male copulatory organ sclerotised, a coiled tube with 1 ¼ counterclockwise rings, 135 (110–155; n=8) long; male copulatory organ base with sclerotised margin, distal acute tip, proximal ring diameter 29 (23–39; n=4). Accessory piece, comprising a long sheath. Testis 58 (91 (74–108; n=2) long, 58 (55–60; n=2) wide, pyriform; seminal vesicle sigmoid; prostatic reservoir spherical. Germarium 70 (55–84; n=23) long, 30 (29–31; n=2) wide, elongate. Ootype not observed. Vaginal aperture dextral, vagina muscular. Seminal receptacle transversely pyriform. Vitellaria coextensive with caeca. Eggs not observed.**Remarks:** *Chauhanellus neotropicalis* n. sp. differs from all other congeneric species by the combined presence of the following features: (1) male copulatory organ, a coiled



**FIGURES 1–7.** *Chauhanellus neotropicalis* n. sp. 1. Holotype, ventral view. 2. Copulatory Complex. 3. Hook. 4. Ventral bar. 5. Dorsal bar. 6. Ventral anchor. 7. Dorsal anchor. Fig. 1. scale 100  $\mu\text{m}$ ; Figs. 2–7 scale of 25  $\mu\text{m}$ .

tube with counterclockwise rings and distal acute tip; (2) ventral bar possessing postero-dorsal foot-like protuberances; (3) dorsal bar with posteromedial process; (4) hooks similar in shape, shanks not inflated.

***Chauhanellus boegeri* n. sp.**

(Figs 8–14)

**Type-host:** *Genidens barbatus* (Lacepède, 1803).

**Site:** Gills.

**Type-locality:** Baía de Guaratuba, Municipality of Guaratuba, State of Paraná, Brazil (01–XII–1998).

**Other records:** *Genidens genidens* (Cuvier, 1829), Baía de Guaratuba, Municipality of Guaratuba, State of Paraná, Brazil (05–I–1994).

**Specimens deposited:** Holotype, MZUSP 6354; 19 paratypes, CHIOC 36821 a–e, MZUSP 6355 a–k, USNPC 98919; 8 vouchers, CHIOC 36822 a–b, MZUSP 6356 a–d; USNPC 98920.

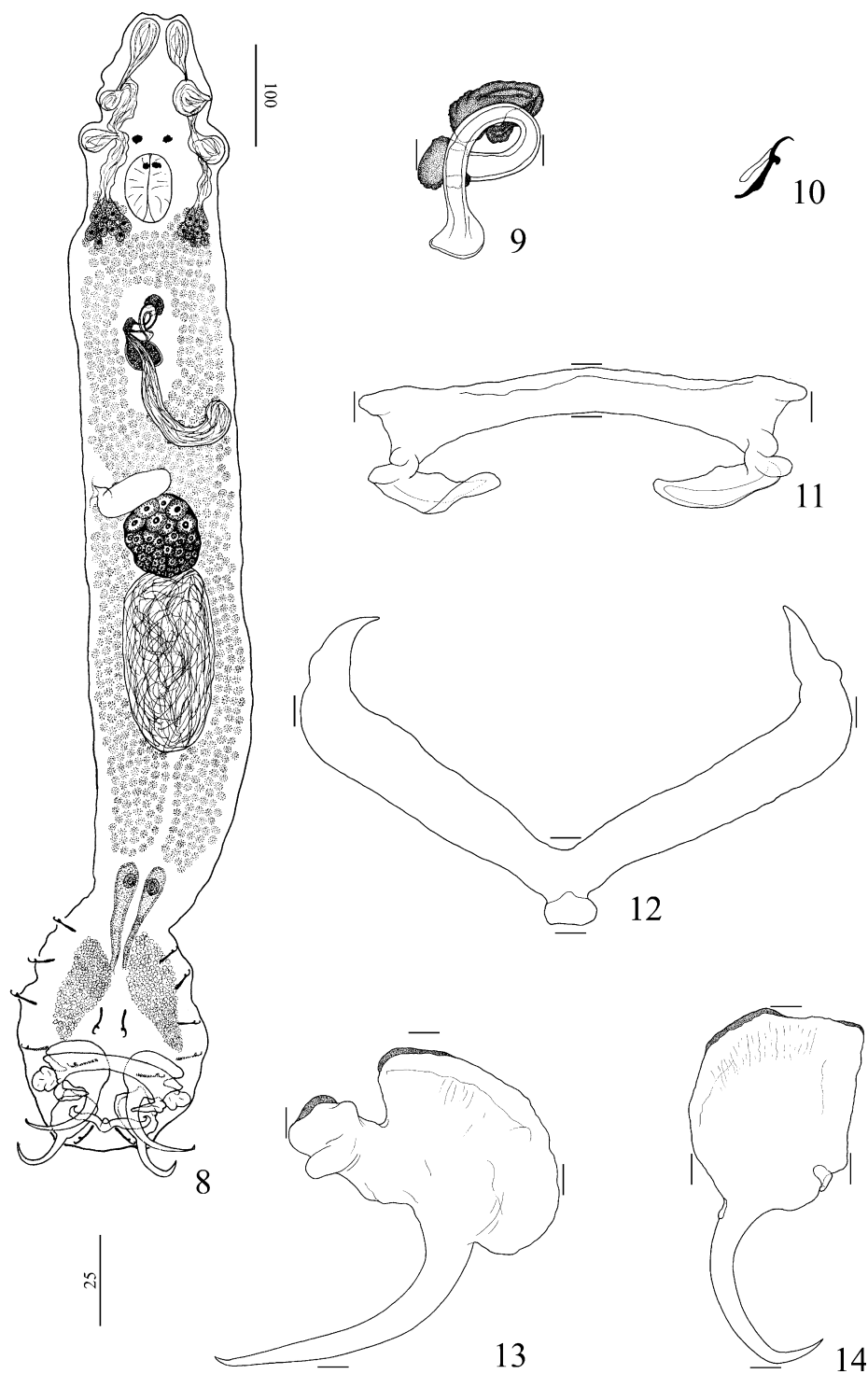
**Etymology:** The specific name is in honor of Dr. Walter A. Boeger, Universidade Federal do Paraná, Brazil, in recognition of his valuable work on the Neotropical Monogenoidea.

**Comparative measurements:** Table 1.

**Description:** (Based on 20 adult specimens) Body 1028 (940–1100; n=5) long, fusiform; greatest width 143 (125–163; n=8) usually at level of germarium. Tegument smooth. Cephalic lobes moderately developed; three pairs of head organs; cephalic glands unicellular, posterolateral to pharynx. Eyes 4; posterior pair closer than anterior pair; accessory granules absent or few in cephalic area. Mouth subterminal, midventral; pharynx spherical to subovate, 57 (48–65; n=7) in diameter; esophagus short; intestinal ceca two, nonconfluent, lacking diverticula. Haptor subspherical to hexagonal, 202 (173–234; n=4) long, 133 (144–168; n=4) wide. Anchors dissimilar; ventral anchor 71 (61–75; n=4) long, base 61 (59–64; n=4) wide, robust, with truncate superficial root, deep root expanded into wings, recurved shaft, short slightly recurved point. Dorsal anchor 85 (82–87; n=4) long, base 35 (32–40; n=3) wide, robust, with inconspicuous superficial root, expanded deep root, evenly curved shaft and point; anchor spine blunt. Ventral bar 30 (28–31; n=3) long, 154 (139–166; n=3) wide, with protuberances at each end for articulation with ventral anchor; posterior protuberances foot-like. Dorsal bar 28 (25–33; n=3) long, 112 (103–120; n=2) wide, V-shaped, with spines on both ends, elongate posteromedial process bent ventrally. Hooks similar; each 16 (14–18; n=20) long, with depressed thumb, evenly curved, shaft, delicate point, shank without inflation, filamentous hook loop (FH loop) about half of shank length. Male copulatory organ sclerotised, a coiled tube of about 1 ¼ counterclockwise rings, 67 (61–75; n=15) long, base with sclerotised margin, flattened end; proximal ring diameter 22 (19–26; n=15). Accessory

**TABLE 1.** Comparative measurements (in  $\mu\text{m}$ ) of specimens of *Chauhanellus boegeri* n. sp. from two species of *Genidens* from Brazil.

	<i>Genidens barbatus</i>	N	<i>Genidens genidens</i>	N
Body				
Length	1028 (940–1100)	5	730	1
Width	143 (125–163)	8	116 (113–120)	2
Pharynx				
Diameter	57 (48–65)	7	49 (46–53)	2
Haptor				
Length	202 (173–234)	4	144 (151–162)	2
Width	133 (144–168)	4	103 (101–106)	2
Copulatory organ				
Length	67 (61–75)	15	68 (58–76)	7
Diameter	22 (19–26)	15	20 (15–25)	7
Ventral anchor				
Length	71 (65–75)	4	62 (60–64)	2
Base width	61 (59–64)	4	45 (40–50)	3
Dorsal anchor				
Length	85 (82–87)	4	67 (62–72)	2
Width	35 (32–40)	3	28 (25–30)	2
Ventral bar				
Length	30 (28–31)	3	23 (22–24)	3
Width	154 (139–166)	3	104 (96–113)	2
Dorsal bar				
Length	28 (25–33)	3	20	2
Width	112 (103–120)	2	103 (91–115)	2
Hook lengths				
Pair 1	16 (14–16)	4	15	2
Pair 2	15 (15–16)	3	15	2
Pair 3	16	1	14	1
Pair 4	16 (14–17)	3	15	1
Pair 5	16 (15–17)	2	17	1
Pair 6	18	3	18 (17–18)	2
Pair 7	18 (17–18)	4	17	1
Testis				
Length	206 (163–300)	8	136 (125–146)	2
Width	82 (72–101)	9	76 (70–82)	2
Germarium				
Length	83 (72–96)	8	55	2
Width	60 (50–72)	8	48	2



**FIGURES 8–14.** *Chauhanellus boegeri* n. sp. 8. Holotype, ventral view. 9. Copulatory Complex . 10. Hook. 11. Ventral bar. 12. Dorsal bar. 13. Ventral anchor. 14. Ventral anchor. Fig. 8. scale 100 µm; Figs. 9–14 scale of 25 µm.

piece a variable sheath. Testis 206 (163–300; n=8) long, 82 (72–101; n=9) wide, pyriform; seminal vesicle sigmoid; prostatic reservoir ovate. Germarium 83 (72–96; n=8) long, 60 (50–72; n=8) wide, subspherical. Ootype not observed. Vaginal aperture dextral, vagina muscular. Seminal receptacle transversely ovate. Vitellaria coextensive with caeca. Eggs not observed.

**Remarks:** *Chauhanellus boegeri* n. sp. resembles *C. neotropicalis* based on the general morphology of haptor structures. However, *C. boegeri* can be distinguished from *C. neotropicalis* by the morphology of the male copulatory organ. The distal tip of the male copulatory organ is flattened in *C. boegeri* and acute in the *C. neotropicalis*. Further, the morphology of the germarium (ovate in *C. boegeri*, pyriform in *C. neotropicalis*) and the seminal receptacle (transversely pyriform in *C. boegeri*, sigmoid in *C. neotropicalis*) can be used to distinguish both species.

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