

## *Annulotrematoides bryconi* sp. n. (Monogenea: Dactylogyridae) parasitic on *Brycon cephalus* (Osteichthyes: Characidae) from Brazil

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**Abstract.** *Annulotrematoides bryconi* sp. n. is described and illustrated from specimens collected from gills of characiform fish, *Brycon cephalus* (Günther, 1869), in pisciculture ponds from Pirassununga, São Paulo, Brazil. Diagnostic characters of the new species are the tegument of trunk showing annulations, except on the cephalic region, and copulatory complex comprising sclerotized male copulatory organ coiled in 1½ rings. This is the first record of monogeneans parasitic on the gills of *B. cephalus*.

Species of *Brycon* Müller et Troschel are fishes with significant importance as food resource and they have great potential for intensive pisciculture in the Amazonian basin (Romagosa et al. 2002). Studies on monogeneans parasitic on these fishes from Neotropical Region have been restricted to two host species: *Brycon melanopterus* (Cope, 1872) from Brazil with species of the dactylogyrid genera *Anacanthorus* Mizelle et Price, 1965; *Jainus* Mizelle, Kritsky et Crane, 1968; *Tereancistrum* Kritsky, Thatcher et Kayton, 1980 and *Trinibaculum* Kritsky, Thatcher et Kayton, 1980; and *Brycon americanus peruanus* Müller et Troschel, 1844 from Peru with an undetermined gyrodactylid species of *Anacanthocotyle* Kritsky et Fritts, 1970 (Kritsky et al. 1979, 1980, Jara 1986).

In this report, a new species of dactylogyrid parasitic on *Brycon cephalus* (Günther, 1869) from Brazil is described and illustrated.

### MATERIALS AND METHODS

The monogeneans studied are part of the material collected from 72 specimens of *B. cephalus* from pisciculture ponds of CEPTA (Centro Nacional de Pesquisas de Peixes Tropicais) from Pirassununga, State of São Paulo, Brazil during April 1999 to March 2000. The fish measured 30–38 cm (mean = 34.9 ± 2.4 cm) in standard length and weighed 321–512 g (mean = 406.2 ± 61.7 g). The monogeneans were removed from the gills of hosts with a 1:4000 formalin solution, fixed in 5% formalin and stored in 70% ethanol. The parasites were stained with Gomori's trichrome and mounted in Canada balsam and some specimens were mounted in Gray and Wess' medium (Humason 1979) for study of sclerotized structures. The measurements are in micrometres (µm); the mean is followed by the range and number of specimens measured (n)

in parentheses. The illustrations were made with the aid of a drawing tube mounted on a Hund Wetzlar H-600 phase contrast microscope. The numeration of the hook pairs follows Mizelle (1936). The holotype and some paratypes were deposited in the Helminthological Collection of the Instituto Oswaldo Cruz (CHIOC), Rio de Janeiro, Brazil, and other paratypes in the Collection of the Natural History Museum of the University of Campinas (UNICAMP), São Paulo, Brazil.

### RESULTS

POLYONCHOINEA Bychowsky, 1937

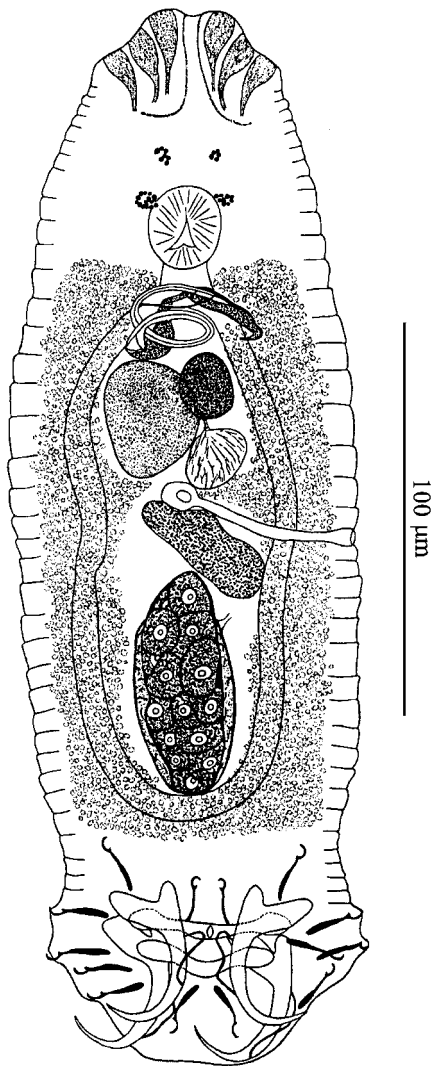
D a c t y l o g y r i d a e Bychowsky, 1933

Ancyrocephalinae Bychowsky, 1937

*Annulotrematoides bryconi* sp. n. Figs. 1–8

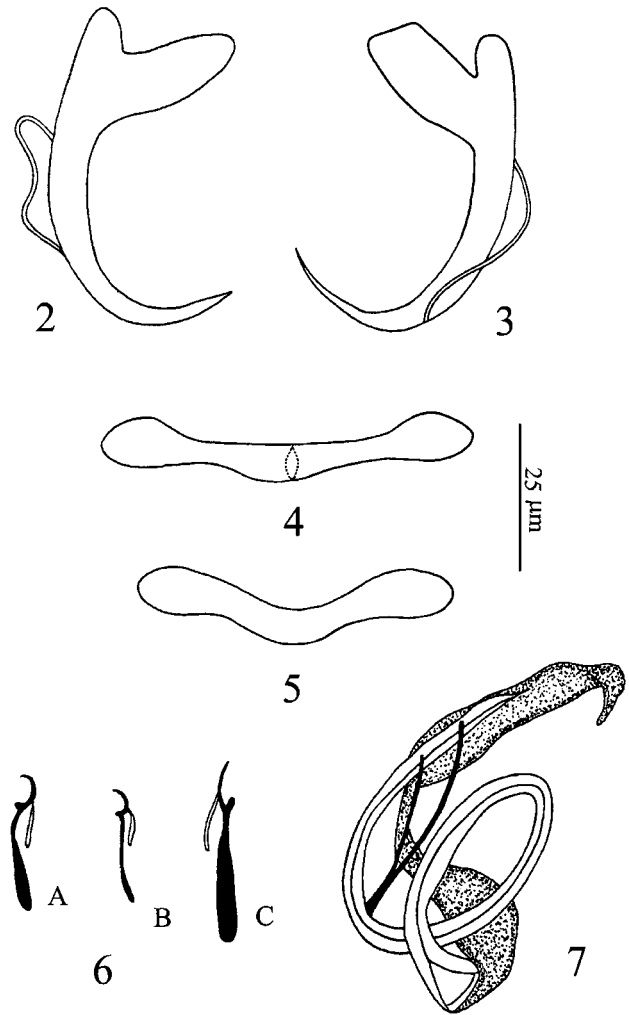
**Description** (based on 19 specimens). Body 376 (264–495, n = 19) long, greatest width 127 (77–165, n = 19). Cephalic lobes developed, 3 pairs of head organs. Accessory eye granules oval, not scattered in cephalic area. Pharynx oval, 19 (18–23, n = 9) in diameter; oesophagus elongate. Peduncle elongate. Haptor subhexagonal, 48 (38–66, n = 19) long, 103 (60–181, n = 19) wide. Similar anchors. Ventral anchor 37 (30–44, n = 6) long, base 11 (8–15, n = 4) wide; dorsal anchor 37 (36–39, n = 6) long, base 14 (11–16, n = 6) wide; with elongate superficial root, short broad deep root, curved shaft, recurved point and anchor filaments. Ventral bar 48 (38–57, n = 7) long, plate-like, with slightly enlarged ends and medial ridge; dorsal bar 44 (33–51, n = 5) long, medial bend. Hooks similar; each with erect thumb, shaft and evenly curved point; proximal half of shank dilated. Hook pairs 1, 5, 18 (18–19, n = 3) long; pairs 2, 3, 4, 6, 7, 23 (20–26, n = 4) long; FH loop

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**Fig. 1.** *Annulotrematoides bryconi* sp. n. Composite drawing of whole mount (ventral view).

extending to just short of union of shank subunits. Male copulatory organ sclerotized, a coiled tube with approximately 1½ counter-clockwise rings; proximal ring 47 (33–60, n = 10) in diameter. Accessory piece articulated, acute terminally, with variable flattened projection near midlength. Copulatory ligament passing within proximal ring of male copulatory organ. Testis dorsal to germarium, 59 (51–63, n = 7) long; vas deferens elongate; seminal vesicle developed, suboval; two saccate prostatic reservoirs. Germarium elongate, 69 (59–78, n = 7) long, 19 (15–23, n = 7) wide. Vagina subspherical, with thick proximal wall, opening into large central seminal receptacle. Vitellaria lateral. Uterus and eggs not observed.



**Figs. 2–8.** *Annulotrematoides bryconi* sp. n. **Fig. 2.** Ventral anchor. **Fig. 3.** Dorsal anchor. **Fig. 4.** Ventral bar. **Fig. 5.** Dorsal bar. **Fig. 6.** Hooks. A – hook pair 1; B – hook pair 5; C – hook pairs 2, 3, 4, 6, 7. **Fig. 7.** Male copulatory organ. Figs. 2–7 drawn to same scale.

**Type host:** *Brycon cephalus* (Günther, 1869) (Characiformes: Characidae).

**Site of infection:** Gills.

**Type locality:** Ponds in Pirassununga, State of São Paulo, Brazil.

**Specimens studied:** Holotype, CHIOC 36276; six paratypes, CHIOC 36272, 36273a–b, 36274a–b, 36275; four paratypes, UNICAMP 12, 13, 14, 15.

**Etymology:** The specific epithet refers to the genus of the type host.

## DISCUSSION

Because of the presence of annulations in the tegument, by the vaginal aperture on the left margin of trunk and by the position of the gonads (testis dorsal to germarium), the new species can be included in *Annulotrematoides* Kritsky et Boeger, 1995. The only other known species of *Annulotrematoides* is *A. amazonicus* Kritsky et Boeger, 1995 parasitic on *Psectrogaster rutiloides* (Kner) from Manaus, Brazil. A related genus *Annulotrema* Paperna et Thurston, 1969 includes some species from African and European freshwater fishes. According to the original diagnosis (Paperna and Thurston 1969), the vaginal aperture of *Annulotrema* is on the left margin of trunk. However, Kritsky and Boeger (1995) stated, after examination of specimens of two unidentified *Annulotrema* species from Togo, that the vaginal aperture opens on the right margin of trunk. Thus, *Annulotrematoides* can be separated from *Annulotrema* by the vaginal aperture on the left margin

of trunk. Another difference between *Annulotrematoides* and *Annulotrema* is the position of the gonads (testis dorsal to germarium in *Annulotrematoides*, dorsoposterior in *Annulotrema*).

*Annulotrematoides bryconi* can be separated from *A. amazonicus* by the large extension of the annulations along the trunk with exception of cephalic region only (annulations are restricted to posterior half of trunk in *A. amazonicus*) and by the coiled male copulatory organ (copulatory organ is not coiled in *A. amazonicus*).

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