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Neotropical Monogenoidea. 32. *Cacatuocotyle paranaensis* n. g., n. sp. (Dactylogyridae, Ancyrocephalinae) from *Characidium* spp. (Teleostei, Characidae) from the State of Paraná, Brazil

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Abstract

Cacatuocotyle paranaensis n. sp. (Dactylogyridae, Ancyrocephalinae) is described from the gills of the characid fishes *Characidium lanei* Travassos and *C. pterostictum* Gomes collected from two streams on the coast of the State of Paraná, Brazil. *Cacatuocotyle* n. g. is proposed for species possessing a single cephalic lobe (terminal), one pair of head organs, a convex haptor with thickened muscular anterior margins, one anchor-bar complex (ventral), seven pairs of ventral hooks (one pair associated with the anchor shafts; one central pair anterior to the bar; five submarginal bilateral pairs) and a sinistral vaginal aperture.

Introduction

During an investigation of gill parasites of fishes from the streams of the Atlantic Coast of the State of Paraná, Brazil, specimens of an unique monogenoidean were collected from two small characids. This species is described herein as the only member of *Cacatuocotyle* n. g. (Dactylogyridae, Ancyrocephalinae).

Materials and methods

Hosts, *Characidium lanei* Travassos, 1967 and *C. pterostictum* Gomes, 1947, were collected in the Rio Cacatu and Rio 2 de Fevereiro near Antonina, Paraná, Brazil, during March and June, 1995. Methods of parasite collection, preparation, measurement and illustration are those described by Kritsky *et al*. (1986). Measurements are in micrometres; the average is followed by the range and number (n) of specimens measured in parentheses. Type-specimens are deposited in the helminthological collections of the Instituto Oswaldo Cruz, Rio de Janeiro, RJ, Brazil (IOC), the University of Nebraska State Museum, Lincoln, NE, USA (HWML) and the United States National Museum, Beltsville, MA, USA (USNPC).

Dactylogyridae Bychowsky, 1933
Ancyrocephalinae Bychowsky, 1937

Cacatuocotyle n. g.

Diagnosis

Body flattened dorso-ventrally, fusiform. Tegument smooth. Cephalic region with terminal ventral cephalic lobe; dorsal subterminal lip with variable protuberances. Bilateral pair of small head organs opening subterminal to tip of cephalic lobe; cephalic glands postero-lateral to pharynx. Eyes present; granules ovate. Mouth subterminal, mid-ventral; pharynx muscular, glandular; intestinal caeca 2, confluent posterior to gonads, lacking diverticula. Gonads tandem to diagonal, intercaecal; testis post-germarial. Vas deferens looping left intestinal caecum; seminal vesicle tortuous, a dilatation of vas deferens; one prostatic reservoir. Male copulatory organ (MCO) comprising coiled tube with counter-clockwise rings (Kritsky et al., 1985); accessory piece articulated to base of MCO; articulation process lying within rings of MCO. Genital pore mid-ventral near level of caecal bifurcation. Seminal receptacle present, anterior to germarium. Vagina sin-

gle, sclerotised; vaginal aperture sinistral. Vitellarium follicular, restricted to trunk. Haptor posteriorly convex, with muscular ridges on anterior margins, armed with pair of ventral anchors, ventral bar and 7 pairs of ventral hooks. Hook shank non-dilated; hook pair 1 central between anchor bases anterior to bar; pair 5 associated with anchor shafts; remaining pairs submarginal, bilateral. Parasites of gills of characid fishes.
Type-species: *Cacatuocotyle paranaensis* n. sp. from *Characidium lanei* (type-host) and *C. pterostictum*. *Cacatuocotyle* is monotypic.

Etymology: The generic name refers to the Rio Cacatu, Paraná, Brazil, from which the type-species was collected.

***Cacatuocotyle paranaensis* n. sp.** (Figures 1–5)

Type-host and locality: *Characidium lanei* (Characidae); Rio Cacatu, Antonina, Paraná, Brazil (30 June 1995).
Other records: *Characidium lanei*, Rio 2 de Fevereiro, Antonina, Paraná, Brazil (15 March 1995). *C. pterostictum*, Rio Cacatu, Antonina, Paraná, Brazil (30 June 1995); Rio 2 de Fevereiro, Antonina, Paraná, Brazil (15 March 1995).
Specimens studied: Holotype, IOC 33682a; 16 paratypes, IOC 33683a-b, 33684a–e, 33685a–d, USNPC 86406, 86407, HWML 38973. 8 vouchers, IOC 33682b-c, USNPC 86408, 86409.

Description

Body 474 (400–555; n = 17) long; greatest width 188 (135–260; n = 16) near mid-length. Cephalic lobe well defined; cephalic glands indistinct. Two pairs of eyes; one or both members of each pair infrequently absent; anterior pair smaller, slightly closer together than posterior pair; numerous accessory granules in cephalic area and anterior body. Pharynx spherical, 32 (27–38; n = 17) in diameter; oesophagus short; caeca sinuous.

Haptor 144 (120–165; n = 17) wide, 67 (60–75; n = 17) long. Anchor 36 (35–38; n = 6) long, robust, with broad superficial root, short deep root, evenly curved shaft and point; base 33 (31–35; n = 6) wide. Bar 16 (11–21; n = 6) long, lightly sclerotised, broadly U-shaped, with irregular margins. Hooks similar; each with short shank and protruding thumb; hook 9–10 (n = 7) long; FH loop extending to proximal end of shank.

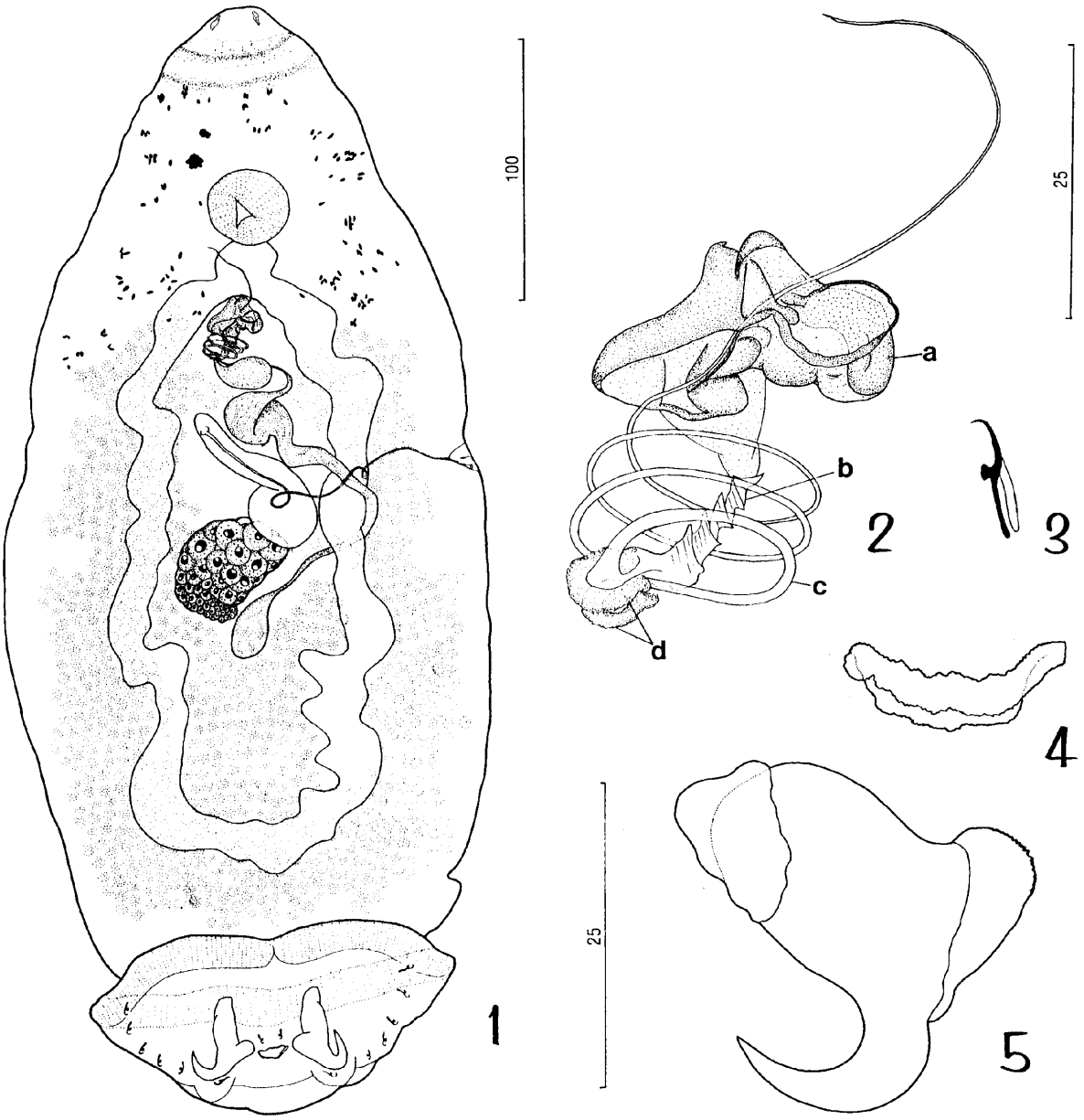
Testis pyriform, 25 (20–28; n = 10) long, 17 (15–21; n = 10) wide; germarium ovate, 45 (31–55; n = 16) long, with greatest width 27 (19–34; n = 15) at distal end. MCO a coil of c, 3.5 rings, with conical base surrounded by 2 tandem circular flanges; distal flange affixed to articulation process of accessory piece; ring diameter 26 (21–31; n = 5). Articulation process of accessory piece twisted, distal portion of accessory piece complex. Seminal vesicle with distal loop. Oviduct, oötype and uterus not observed. Seminal receptacle pyriform. Vagina elongate, fine, sclerotised, entering anterior end of pyriform seminal receptacle. Vitelline follicles absent near oesophagus, pharynx and reproductive organs. Egg not observed.

Etymology: The specific name refers to the Brazilian State of Paraná from which the species was collected.

Discussion

While clearly a member of the Dactylogyridae (*sensu* Kritsky & Boeger, 1989), *Cacatuocotyle paranaensis* n. g., n. sp. possesses features typically not associated with the family. Most significant are the presence of one pair of anchors ventral in the haptor, seven pairs of ventral hooks and a reduction in the number and complexity of the head organs.

Boeger & Kritsky (1993) found “one pair of anchors ventral in the haptor” to be a synapomorphy for the Class Monogenoidea. While “2 ventral pairs of anchors in the haptor” developed later as a synapomorphy for the Order Dactylogyridea, Boeger & Kritsky (1993) considered the subsequent migration of one anchor pair to the dorsal surface of the haptor to be a secondary development within the Dactylogyridea and a symplesiomorphy of the Dactylogyridae. Occurrences of a single anchor pair in some dactylogyrid species (i.e. species of *Aplodiscus* Rogers, 1967; *Bivaginogyrus* Gusev & Gerasev, 1985; *Cacatuocotyle* n. g.; *Dactylogyroides* Gusev, 1963; *Dactylogyrus* Diesing, 1850; *Dogielius* Bychowsky, 1936; *Pellucidhaptor* Price & Mizelle, 1964; *Pseudodactylogyroides* Ogawa, 1986; *Pseudodactylogyrus* Gusev, 1965; *Rhinonastes* Kritsky, Thatcher & Boeger, 1988; *Rhinoxenus* Kritsky, Boeger & Thatcher, 1988; *Schilbetrematoides* Kritsky & Kulo, 1992; *Trinigyrus* Hanek, Molnar & Fernando, 1974; among others) apparently represent multiple independent examples of secondary loss of either the ventral or dorsal pair (see Kritsky & Kulo, 1992). Thus, while sharing the feature of a lost anchor



Figures 1–5. Cacatuocotyle paranaensis n. sp. 1. Holotype (ventral). 2. Copulatory complex. 3. Hook. 4. Bar. 5. Anchor. *Abbreviations*: a, distal portin of accessory piece; b, articularion process; c, male copulatory organ; d, flanges of the base of the male copulatory organ. *Scale-bars*: 1, 100 μm; 2, 25 μm (upper); 3–5, 25 μm (lower).

pair with some dactylogyrid genera, evolutionary relationships of *Cacatuocotyle* based on number and position of anchors remain obscure.

Mizelle (1936; see Mizelle & Price, 1963) described the pleisomorphic distribution of hook pairs in the adult dactylogyrid haptor (Boeger & Kritsky, 1993). However, redistribution of hooks in adults of some dactylogyrids has occurred (i.e. *Pellucidhaptor*, see Kritsky et al., 1972). In *Cacatuocotyle paranaensis*, hook pairs 6 and 7 of Mizelle (1936) have migrated to a ventral position in the haptor. Although these pairs are not specifically identifiable in *C. paranaensis*, they are obviously included in the five hook pairs situated ventro-laterally in the haptor.

Dactylogyrids typically possess three to five pairs of head organs which represent assemblages of terminations of ducts through which the cephalic glands discharge. Reductions in the number and complexity of the head organs in *C. paranaensis* apparently represent autapomorphic features of the genus.

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