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A NEW GENUS AND SPECIES OF CRYPTOGONIMID FROM *LUTJANUS* SPP. (PISCES: LUTJANIDAE) ON THE GREAT BARRIER REEF AND NEW CALEDONIA

Terrence L. Miller and Thomas H. Cribb

Department of Microbiology and Parasitology, The University of Queensland, Brisbane, Queensland 4072, Australia. *e-mail: s4068087@student.uq.edu.au*

ABSTRACT: *Lobosorchis tibaldiae* n. gen. and n. sp. (Digenea: Cryptogonimidae) is described from the intestine, pyloric ceca, and rectum of 2 species of *Lutjanus* (Pisces: Lutjanidae), *Lutjanus carponotatus* and *Lutjanus fulviflamma*, from the Great Barrier Reef, Queensland, Australia, and New Caledonia. The genus is tentatively placed in the Neochasminae and is distinguished within the Cryptogonimidae by the combination of follicular testes, oral spines, and vitelline follicles restricted to the anterior region of the body not extending posteriorly to the ventral sucker.

The Cryptogonimidae Ciurea, 1933, are common intestinal digeneans parasitic in both marine and freshwater teleosts and reptiles. Many species have been reported from teleosts in the Lutjanidae, but on the Great Barrier Reef in Australia, very few studies have considered the cryptogonimid fauna infecting this family. Only 1 account of cryptogonimid trematodes infecting lutjanids on the Great Barrier Reef has been published to date; Lester and Sewell (1990) found a species identified to *Paracryptogonimus* Yamaguti, 1934, from *L. carponotatus* and 1 identified only to Cryptogonimidae from *Lutjanus adetii*. The only other record of a cryptogonimid trematode reported from the Great Barrier Reef is that of *Mitotrema anthostomatum* Manter, 1963, which was redescribed from teleosts in the Serranidae by Cribb et al. (1996). Cryptogonimid trematodes have been reported only once from New Caledonia by Durio and Manter (1969), who described 5 new species in 2 genera, all infecting species of *Lutjanus*.

Two species of *Lutjanus* from the Great Barrier Reef and New Caledonia were examined in this study: *L. carponotatus* and *L. fulviflamma*. A new cryptogonimid trematode was found that does not agree with any previously known species or genus and is described here.

MATERIALS AND METHODS

Species of *Lutjanus* were collected from the following localities using baited line or spear and examined for endohelminths: Heron Island, Queensland, Australia; Lizard Island, Queensland, Australia; and 1 specimen of *L. fulviflamma* was recovered from New Caledonia. Trematodes were removed from freshly killed fish, washed with 0.85% saline, killed by pipetting them into a nearly boiling saline solution, and preserved in 5% formalin. Whole mounts were stained with Mayer's hematoxylin and dehydrated through a graded series of ethanol before mounting in Canada balsam. Drawings were made with the aid of a camera lucida. All measurements were made using an ocular micrometer and are in micrometers, with the range followed by the mean in parentheses, unless stated otherwise. One specimen was mounted in epon resin and 1-μm sagittal sections were prepared, stained with toluidine blue, and examined with light microscopy. Descriptions and measurements are based on examination of 14 adult specimens.

DESCRIPTION

Lobosorchis n. gen.

Diagnosis

Cryptogonimidae Ciurea, 1933, Neochasminae Van Cleave & Mueller, 1932. Body small, oval shaped. Tegument entirely covered in minute spines. Cercarial eye-spot pigment present in anterior half of body. Oral sucker large, opening terminally, with a single row of short circumoral spines. Ventral sucker far smaller than oral sucker, median, near midbody in depression in tegument. Genital pore immediately anterior to ventral sucker. Prepharynx and esophagus both distinct, approximately equal length. Pharynx large, often larger than ventral sucker. Ceca long, extending to near posterior extremity. Intestinal bifurcation immediately anterior to ventral sucker or dorsal to anterior end of ventral sucker. Testes opposite, each divided into 4–5 closely clustered but completely separate follicles in posterior half of body. Seminal vesicle large, saccular. Gonotyl a small, symmetrical lobe immediately anterior to genital pore. Ovary median, entire, deeply lobed, ventral to testes, near midbody. Seminal receptacle spherical. Laurer's canal present. Vitelline follicles restricted to anterior half of body, not extending posterior to ventral sucker. Uterus coiled, confined to posterior half of body, not extending anteriorly to anterior margin of ventral sucker. Eggs small, numerous. Excretory vesicle Y-shaped, bifurcation at level of ovary; arms extending to level of pharynx. Intestinal parasites of marine teleosts (Lutjanidae).

Lobosorchis tibaldiae n. sp.

(Figs. 1–3)

Diagnosis

Body small, widest at level of ovary, 398–565 (466) long and 244–411 (302) wide. Cercarial eyespot pigment concentrated around and posterior to pharynx but extending as far posterior as midbody. Oral sucker 55–87 (72) long and 112–193 (141) wide, armed with 47–56 (50) circumoral spines 10–16 (11) in length. Ventral sucker 128–176 (150), or 28–36 (32)% body length, from anterior end, embedded within depression in tegument, 45–58 (51) long and 45–61 (53) wide. Sucker width ratio 2.5–3.2 (2.7) : 1. Genital pore immediately anterior to ventral sucker. Prepharynx 10–22 (15) long. Pharynx slightly larger than ventral sucker, 48–67 (57) long and 48–96 (64) wide. Esophagus 13–22 (17) long. Intestinal bifurcation anterior to ventral sucker or dorsal to anterior margin of ventral sucker. Ceca 240–321 (289) long, extending to near posterior end of body. Testes opposite, each divided into 4–5 large, completely separate follicles, in posterior half of body, 74–183 (118) long and 67–161 (103) wide; individual follicles 29–87 (50) long and 35–74 (53) wide. Seminal vesicle large, saccular, extending from between anterior region or midline of ovary to slightly anterior to ventral sucker. Gonotyl a small symmetrical lobe, immediately anterior to ventral sucker. Ovary deeply

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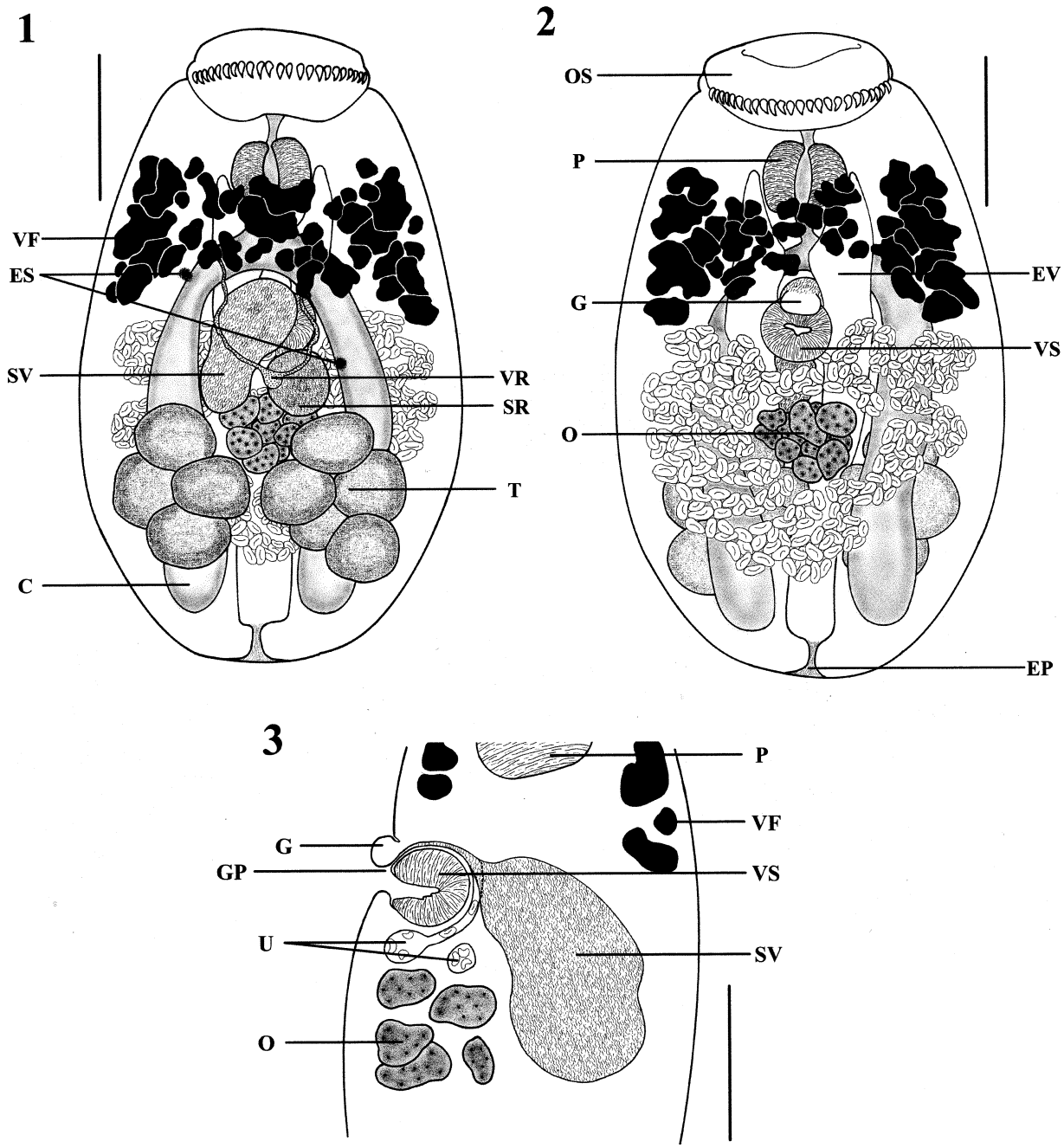

FIGURES 1–3. *Lobosorchis tibaldiae* n. gen. and n. sp. from *Lutjanus* spp. (**1**) Dorsal view. (**2**) Ventral view. (**3**) Sagittal section. Bar = 100 μm. Abbreviations: C = ceca; EP = excretory pore; ES = eye-spot pigment; EV = excretory vesicle; G = gonotyl; GP = genital pore; O = ovary; OS = oral sucker; P = pharynx; SR = seminal receptacle; SV = seminal vesicle; T = testes; U = uterus; VF = vitelline follicles; VR = vitelline reservoir.

lobed, in midbody, 61–116 (84) long and 71–125 (95) wide. Seminal receptacle spherical, dorsal to ovary. Laurer's canal long, extending dorsal to ovary posterior to seminal vesicle and seminal receptacle, exiting to pore on dorsal side in about midbody. Vitelline follicles in confluent transverse band both dorsally and ventrally in anterior region of body, not extending posteriorly to ventral sucker. Uterus coiled, descends from ovary on either left or right side of body and ascends on opposite side, then crosses body anterior to ovary and ascends to genital pore, restricted to hindbody. Uterus and seminal vesicle unite dorsal to anterior half of ventral sucker to form hermaphroditic duct, which opens at genital pore. Eggs small, numerous, thick-shelled, 13–19 (16) long and 7–10 (8) wide. Excretory vesicle Y-shaped, bifurcates dorsal to ovary with arms extending to level of pharynx, 311–456 (366) long.

Taxonomic Summary

Type host: L. carponotatus (Richardson, 1842) Lutjanidae
Additional hosts: L. fulviflamma (Forsskål, 1775).

Site of infection: Intestine, pyloric ceca, and rectum.

Type locality: Australia, Queensland, Heron Island, 23°27′S, 151°55′E.

Additional localities: New Caledonia, 21°30′S, 165°30′E; Australia, Queensland, Lizard Island, 14°40′S, 154°28′E.

Deposition of specimens: Holotype (QM G 223171) and 7 paratypes (QM G 223172–8) in the Queensland Museum, Brisbane, Australia; 6 paratypes (USNPC 95146–95150) in the United States National Parasite Collection, Beltsville, Maryland.

Etymology: Genus name from the Greek *lobos*, lobe, and *orchis*, testis, referring to the lobed testes. Species named in honor of Ms. Megan L. Tibaldi.

Remarks

Lobosorchis can be distinguished from all previously described genera in the Cryptogonimidae by the combination of 3 characters, i.e., deeply follicular testes, oral spines, and vitelline follicles that do not extend posterior to the ventral sucker.

Two entire testes are seen in most cryptogonimids; single, lobed, multiple, or follicular testes are uncommon. The single species of *Retrobulla* Cribb, 1986, is the only species with 1 testis. Two species of *Paracryptogonimus* Yamaguti, 1934, i.e., *Paracryptogonimus apharei* Yamaguti, 1942, and *Paracryptogonimus echinostomus* Oshmarin, et al., 1961, have 2 lobed testes. Five other genera, *Acanthosiphodera* Madhavi, 1974, *Iheringtrema* Travassos, 1947, *Novemtestis* Yamaguti, 1942, *Polyorchitrema* Srivastava, 1939, and *Siphodera* Linton, 1910 (the first 3 listed are monotypic), have multiple or follicular testes.

Paracryptogonimus apharei and *Paracryptogonimus echinostomus* each have 2 testes with slight lobes, whereas *Lobosorchis* has testes divided into distinct, completely separate follicles. These 2 species also differ from *Lobosorchis* by restriction of the vitelline follicles from just anterior to the ventral sucker posterior to the level of the ovary, and both have elongated bodies.

The presence of oral spines in *L. tibaldiae* immediately distinguishes it from species of *Iheringtrema*, *Polyorchitrema*, and *Siphodera*. These 3 genera all possess multiple or follicular testes but have oral suckers opening subterminally and lack oral spines. *Acanthosiphodera bengalense* Madhavi, 1974, has oral spines but differs from *L. tibaldiae* in having a subterminally opening oral sucker and vitelline follicles that are restricted to the hindbody. *Novemtestis armatus* Yamaguti, 1942, known only as a metacercaria, also has oral spines but differs from *L. tibaldiae* in the number and position of the oral spines, the extent of the vitelline follicles, and the presence of cecal ani. *Novemtestis armatus* possesses between 255 and 260 tiny oral spines distributed in a single row on the dorsal side of the body and 2–3 rows on the ventral side. *Lobosorchis tibaldiae* has a single row of 47–56 circumoral spines. In *L. tibaldiae*, the vitelline follicles are restricted to the forebody and do not extend posterior to the ventral sucker, whereas in *N. armatus*, they extend from the oral sucker to the level of the testes. The presence of cecal ani in *N. armatus* further distinguishes it from *L. tibaldiae*, which has blind ceca.

The subfamily classification of the Cryptogonimidae is presently in disarray. It has never been considered critically. Yamaguti (1971) recognized 15 subfamilies, of which 9 were monotypic. Since Yamaguti's work, the only major revision done within the family has been that on the Acanthostominae Poche, 1926, by Brooks (1980) and Brooks and Holcman (1993), who synonymized the Acanthostomidae Poche, 1926, with the Cryptogonimidae. There are currently 25 subfamilies, of which 17 are monotypic, emphasizing the need for a revision of the family. *Lobosorchis* sp. is in agreement with the Neochasminae and is tentatively placed in this subfamily subject to a comprehensive revision of the family.

The description of *L. tibaldiae* brings the number of cryptogonimid species reported from *L. fulviflamma* to 12, comprising 7 genera. This is the greatest number of cryptogonimids known from a single teleost species. *Micropterus salmoides* and *Lateolabrax japonicus* have been reported with the next highest numbers of cryptogonimids, 9 and 10 species, respectively. *Lobosorchis tibaldiae* is the only fully identified cryptogonimid known from *L. carponotatus*.

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