

A New Species of *Caecincola* (Trematoda: Cryptogonimidae) from Spotted Bass (*Micropterus punctulatus*) in the Big Thicket National Preserve, Texas, U.S.A.

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ABSTRACT: *Caecincola autumnae* n. sp. is described from the pyloric ceca of spotted bass (*Micropterus punctulatus*) collected from Big Sandy Creek in the Big Sandy Creek Unit of the Big Thicket National Preserve, Polk County, Texas, U.S.A. It can be distinguished from all other species of *Caecincola* by the presence of an ovary with 4 lobes and a narrowly obpanduriform to narrowly obpyriform body.

KEY WORDS: *Caecincola autumnae*, *Micropterus punctulatus*, spotted bass, Big Thicket National Preserve, Texas.

Four species of *Caecincola* (Trematoda: Cryptogonimidae) have been described: *Caecincola latostoma* Greer and Corkum, 1979, *Caecincola longiscens* Curran and Overstreet, 2009, *Caecincola parvulus* Marshall and Gilbert, 1905, and *Caecincola wakullata* Premvati, 1967, all from centrarchid fishes in North America. The familial assignment and validity of *Caecincola* has been discussed by Gibson (1996), Miller and Cribb (2008), and Curran and Overstreet (2009), the last of whom also summarized the issues surrounding the definition of *Caecincola* and its differentiation, or lack thereof, from *Cryptogonimus*. The new species described by Curran and Overstreet (2009) bears features in common with both *Caecincola* and *Cryptogonimus*, but they placed that species in *Caecincola* because it lacks a gonotyl and its oral sucker is wider than long. During a survey of the parasites of fishes as part of an All Taxon Biodiversity Inventory in the Big Thicket National Preserve of southeastern Texas, U.S.A., specimens of a previously undescribed species of *Caecincola* were recovered from spotted bass *Micropterus punctulatus*; the species is described herein.

MATERIALS AND METHODS

Spotted bass were collected by seine from Big Sandy Creek in the Big Sandy Creek Unit of the Big Thicket National Preserve, Polk County, Texas, U.S.A., in July 2008. Ninety-two gravid specimens of *Caecincola* were recovered from the intestinal ceca of 4 spotted bass. Worms were killed in near-boiling water, fixed and stored in 70% ethanol, stained in carmalum or acetocarmine, dehydrated in an ethanol series, cleared in xylene, and mounted on glass slides in damar balsam. Mounted worms were examined with bright-field and differential interference contrast microscopy on an Olympus B-Max 50 compound microscope. Line drawings of individual structures were made from high-resolution photographs taken in series at adjacent focal planes with an Olympus DP-70 camera, and drawings

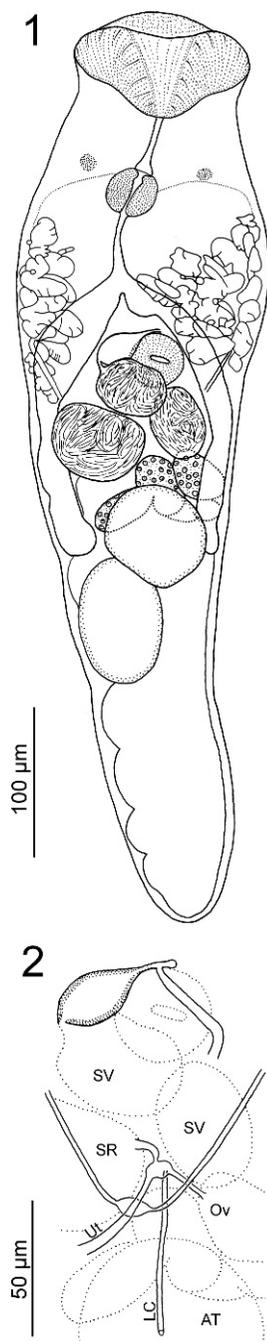
were then assembled in Adobe Photoshop 7.0 software (Adobe Systems Inc., San Jose, California, U.S.A.) to produce composite line drawings. Measurements are presented in μm as the range followed by the mean parenthetically. Names of shapes follow the recommendations of Clopton (2004). Specimens from the following lots in the U.S. National Parasite Collection were examined for comparison: 074811, 100836 (*C. latostoma*); 100838 (*C. longiscens*); 051428, 076653, 095473, 095474 (*C. parvulus*); 062930 (*C. wakullata*).

RESULTS

Caecincola autumnae n. sp. (Figs. 1–2)

Description

Based on observations of 33 specimens and measurements of 19. Adult worms narrowly obpanduriform to narrowly obpyriform, appearing as small black dots through the wall of the pyloric ceca. Worms 530–630 (580) long, 143–198 (169) wide at widest point; ratio of body length to width 3.0–3.9:1. Very small, scale-like spines cover entire body surface. Mouth terminal, surrounded by large, shallowly obpyriform oral sucker; oral sucker 65–78 (73) long, 103–123 (115) wide. Prepharynx, 20–35 (29) long, usually slightly curved and directed dorsally. Pharynx 25–35 (28) long, 28–34 (31) wide. Esophagus 30–50 (42) long, with 1 shallow curve prior to joining intestinal ceca; bifurcation 158–185 (169) from anterior end, anterior to ventral sucker. Ceca lateral, in dorsal half of worm, extending to between midpoint of anterior testis to anterior of posterior testis, 178–250 (219) from posterior end. Ventral sucker 30–35 (31) long, 34–38 (36) wide, withdrawn within ventrogenital sac, in anterior half of body; anterior edge posterior to bifurcation of intestinal ceca; posterior edge 223–270 (238) from



Figures 1–2. Line drawings of *Caecincola autumnae*. **1.** Holotype, dorsal view. Eggs omitted; outline of space occupied by uterus shown only. Worm is tilted slightly to its left. **2.** Details of genitalia, composite drawing from multiple specimens; structures in stippled outline are those visible on holotype above. AT, anterior testis; LC, Laurer's canal; Ov, ovary; SR, seminal receptacle; SV, seminal vesicle; Ut, uterus.

anterior end, 323–385 (351) from posterior end. Vitelline follicles mostly extra-cecal, digitate and broadly interconnected, with single vitelline duct on each side extending posteriorly and medially along dorsal surface to level of ovary, forming a small vitelline reservoir. Vitelline follicles extend from approximately posterior level of pharynx to posterior level of ventral sucker. Ovary 265–340 (293) from anterior end, consisting of 4 irregularly shaped and distinct lobes, often with smaller lobes arising from them. Ovary ventral to testes and overlapping anterior testis substantially; total space occupied by ovary, 43–63 (52) long, 60–93 (78) wide. Oviduct seen in only 1 specimen, short, leading anteriorly and medially to common union with duct from seminal receptacle and Laurer's canal; union with duct from vitelline reservoir not observed. No distinct Mehlis' gland observed. Uterus largely ventral, occupying most of the space posterior of the ventral sucker and completely filling space posterior of testes. Eggs numerous, 17.5–20 long, 7.5–8.8 wide, as measured through body wall, with small abopercular knob (eggs somewhat deformed in permanent mounts). Laurer's canal extends dorsally and posteriorly from origin, terminates at small pore on dorsal surface at level of midpoint of anterior testis. Seminal receptacle lateral, 40–58 (47) along long axis, 30–63 (48) along perpendicular axis; sperm abundant. Testes near dorsal surface, arranged obliquely or in tandem, both variable in shape, edges not scalloped or lobed. Anterior testis 290–388 (319) from anterior end, 65–83 (74) long, 43–73 (57) wide; posterior testis larger, 73–98 (85) long, 50–70 (62) wide. Vasa eferentia extend anteriorly and contact posterior seminal vesicle without uniting; no vas deferens detected. Cirrus sac lacking; bipartite seminal vesicle naked, occupying medial position, overlapping ventral sucker moderately; distal portion 40–60 (50) along long axis, 25–45 (35) along perpendicular axis; proximal portion 35–63 (45) along long axis, 33–50 (37) along perpendicular axis. Distal portion of seminal vesicle leads to prominent bulb that narrows anterior to ventral sucker and unites with uterus to form short common genital duct; genital pore immediately anterior to ventral sucker. Excretory bladder with 2 large branches that reach level of pharynx; excretory pore terminal. Pigmented cells present as eyespots at level of anterior edge of pharynx.

Taxonomic summary

Type host: Spotted bass, *Micropterus punctulatus*.

Type locality: Big Sandy Creek, Big Sandy Creek Unit, Big Thicket National Preserve, Polk County, Texas, U.S.A., 30.662278°N; 94.69806°W.

Date of collection: 4 July 2008.

Site of infection: Pyloric ceca.

Specimens deposited: Holotype and paratypes on 6 slides, each with multiple specimens. Slide bearing holotype marked with "holotype" scratched on surface; holotype identified by circle scratched on underside of slide. All slides deposited in Harold W. Manter Laboratory of Parasitology, Nebraska State Museum, Lincoln, Nebraska, HWML 49156 (holotype and paratypes; BITH-17003) and 49157 (paratypes; BITH-17004).

Etymology: The specific epithet is in honor of Dr. Autumn Smith, who assisted in the collection of fishes in 2008.

Remarks

Caecincola autumnae n. sp. can be distinguished from the other 4 species in the genus by the presence of an ovary consisting of 4 lobes, often with smaller lobes arising from them. The ovary of all 4 other species of *Caecincola* consists of 3 lobes. In addition, *C. parvulus* is roughly elliptical in shape, the ceca terminate at the anterior edge of testes, the vitelline follicles are confined to the pharyngeal region, the seminal vesicle and receptacle are smaller, and the arrangement of the testes is oblique to opposite (Marshall and Gilbert, 1905); *C. wakullata* has a seminal vesicle that extends anterior of the ventral sucker, a different body shape, testes in the posterior quarter of the body, no prepharynx, and an oral sucker that constitutes about a quarter of the body length (Premvati, 1967); *C. longiscens* is much larger (~1.5 mm), has an elongated body shape, the vitelline follicles are confined to the hindbody, and the seminal vesicle is tubular and convoluted (Curran and Overstreet, 2009).

Caecincola autumnae most closely resembles *C. latostoma*. The overall size is similar, although *C. latostoma* is somewhat larger (516–856), the vitelline follicles are similar in position and arrangement, the eggs of both possess a small abopercular knob, and the positional relationships of all the organs are very similar. However, the body of *C. latostoma* is more

broadly obpanuriform (length:width ratio = 2.4–2.6:1, as measured on type series and vouchers) than *C. autumnae* (3.0–3.9:1), the testes are nearly opposite in orientation, the eggs are larger (24 × 12 vs. 17.5–20 × 7.5–8.8), the ceca are shorter, and the seminal receptacle is much smaller in relation to the other reproductive organs (smaller than an ovarian lobe) (Greer and Corkum, 1979).

ACKNOWLEDGMENTS

Drs. Autumn Smith, Tamara Cook, Jerry Cook, and Ms. Heather Robinson assisted with the collection of fishes. Dr. Richard Clopton provided the use of his microscope. The National Park Service provided collecting permits and access to the Big Thicket National Preserve. This work was funded in part by a grant from the Big Thicket Association for the conduct of a portion of an All Taxon Biodiversity Inventory being co-sponsored by the Big Thicket National Preserve. The views expressed in this manuscript are solely those of the author.

LITERATURE CITED

- Clopton, R. E.** 2004. Standard nomenclature and metrics of plane shapes for use in gregarine taxonomy. *Comparative Parasitology* 71:130–140.
- Curran, S. S., and R. M. Overstreet.** 2009. *Caecincola longiscens* n. sp. (Digenea: Cryptogonimidae) from the white crappie, *Pomoxis annularis*, in Mississippi, U.S.A. *Comparative Parasitology* 76:19–23.
- Gibson, D. I.** 1996. Trematoda. Pages 1–373 in L. Margolis and Z. Kabata, eds. *Guides to the Parasites of Fishes of Canada, Part IV. Canadian Special Publication of Fisheries and Aquatic Sciences* 124, Ottawa, Canada.
- Greer, G. J., and K. C. Corkum.** 1979. Life cycle studies of three digenetic trematodes, including descriptions of two new species (Digenea: Cryptogonimidae). *Proceedings of the Helminthological Society of Washington* 46:188–200.
- Marshall, W. S., and N. C. Gilbert.** 1905. Three new trematodes found principally in black bass. *Zoologischer Jahrbüchern* 22:476–488.
- Miller, T. L., and T. H. Cribb.** 2008. Family Cryptogonimidae Ward, 1917. Pages 51–112 in R. A. Bray, D. I. Gibson, and A. Jones, eds. *Keys to the Trematoda Vol. 3*. CAB International and Natural History Museum, Wallingford and London, U.K.
- Premvati, G.** 1967. *Multigonotylus micropteri* gen. et sp. n. and *Caecincola wakullata* sp. n. (Digenea: Cryptogonimidae) from freshwater bass, *Micropterus salmoides*. *Journal of Parasitology* 53:743–746.