

NEW AND PREVIOUSLY DESCRIBED SPECIES OF MONOGENETIC TREMATODES FROM LABRADOR CATOSTOMIDS AND CYPRINIDS¹⁾

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Abstract. During August-September 1969, host collections were made at three localities in Labrador. Eighty fishes, representing four species (30 *Hybopsis plumbea* (Agassiz), 5 *Rhinichthys cataractae* (Valenciennes), 40 *Catostomus catostomus* (Forster), and 5 *Catostomus commersoni* (Lacépède)) were examined for monogenetic trematodes. Nine species of monogenetic trematodes were encountered, namely: *Gyrodactylus aldrichini* sp. n.; *G. aquilinus* sp. n.; *G. stunkardi* Kritsky and Mizello, 1968; *G. atratuli* Putz and Hoffman, 1963; *G. commersoni* sp. n.; *G. plumbeae* sp. n.; *G. spathulatus* Mueller, *Cleidodiscus brachus* Mueller, 1938; *Anonchhaptor anomalum* Mueller, 1938. A description of the new species, as well as detailed measurements and drawings of hard parts of all species recovered are given.

Threlfall and Hanek (1970) noted that little work has been done on the helminthofauna of fishes from the northern parts of North America. A summer expedition to Labrador, in 1969, provided an opportunity to help remedy this situation, two species of catostomids (*Catostomus catostomus* (Forster), *C. commersoni* (Lacépède)) and two species of cyprinids (*Hybopsis plumbea* (Agassiz), *Rhinichthys cataractae* (Valenciennes)) being examined for monogenetic trematodes. All these fish species have a wide distribution in North America (Eddy 1969) and are common in Labrador (Backus 1957).

MATERIALS AND METHODS

Eighty fish of four species were collected at three localities (Table 1) in Labrador, during August and September, 1969, and examined for monogenetic trematodes, using Malmberg's (1956, 1970) and Gussev's (1968) techniques. The fish were caught in either a 30 ft. hand-seine or gill nets, and were examined immediately upon capture. Monogenetic trematodes were fixed in a mixture of glycerol and ammonium picrate and examined with a phase-contrast microscope. Drawings were made using a camera lucida. Holotypes were deposited in the United States National Museum. Paratypes are in the collection of the Department of Biology, Memorial University of Newfoundland, St. John's. All measurements are given in microns. Type host, location and locality are indicated by an asterisk.

¹⁾ Studies in Biology from Memorial University of Newfoundland No. 207.

Table 1. Details of origin and number of cyprinids and catostomids examined and number and percentage infected with *Monogenea*.

Species	Origin	Map reference	No. examined	No. infected	% infected
1. <i>Hybopsis plumbea</i>	Grand Lake	53°35' N . 60°15' W	15	11	73
	Naskaupi River	53°35' N . 60°54' W	15	14	93
2. <i>Rhinichthys cataractae</i>	Grand Lake	53°35' N . 60°15' W	5	4	80
3. <i>Catostomus catostomus</i>	Grand Lake	53°35' N . 60°15' W	25	13	52
	Eagle River	53°34' N . 57°27' W	15	5	33
4. <i>Catostomus commersoni</i>	Grand Lake	53°35' N . 60°15' W	5	4	80

RESULTS AND DISCUSSION

SUBGENUS *GYRODACTYLUS* (*GYRODACTYLUS*)

A. *Gyrodactylus elegans* group

Diagnosis: After Malmberg (1970)

1. *G. aldrichi* sp. n.

(Fig. 1)

Host **Hybopsis plumbea* (Agassiz). Location: *Gills. Locality: *Grand Lake (53°35'N. 60°15'W). Incidence and intensity of infection: Six fish infected (20 percent) with two to eight helminths (av. 5.3). Number measured: Ten. Holotype: USNM Helm. Coll. No.70737.

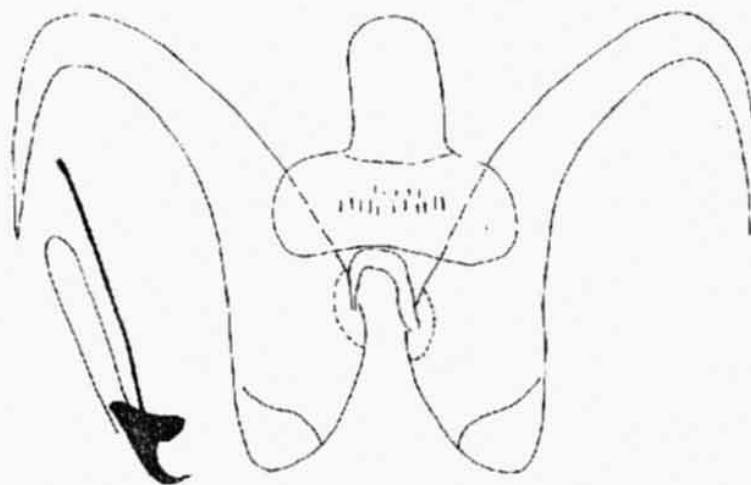


Fig. 1. Anchor complex and marginal hook of *Gyrodactylus aldrichi* sp. n.

Description (Holotype (Paratypes)): Overall length 840 (620—840), width 72 (60—91); pharynx 78 (64—78) long, anterior width — (55—78), posterior width — (58—78). Cirrus 19 (15—19) in diameter. Haptor 96 (72—96) long, 132 (97—132) wide. Anchors 33 (33—35), base 27 (26—27), point 15 (13—15), inner root 10 (9—10). Ventral bar 5 (5—6) long by 14 (12—14) wide. Dorsal bar 2 (2) by 10 (8—10). Membrane 6 (6—9) long. Marginal hooks 22 (22), hooklets 5 (5) long.

Remarks: This species was named in honour of Dr. F. A. Aldrich, former Director of the Marine Sciences Research Laboratory, Memorial University, and now the Dean of Graduate Studies at the same institution.

The closest relative of *G. aldrichi* is *G. minimus* Malmberg, 1957. It may be distinguished from the latter species by the following characteristics, (a) the anchor root is much broader with a rounded end, (b) the anchors are longer (34—36 long as opposed to 30—32), (c) dorsal bar is wider (8—10: 6—7), (e) marginal hooks and shaft are longer (22:19), (f) differences in the shape of the marginal hooks. The marginal hooks of *G. aldrichi* have a well developed, almost pointed heel and a blunt toe with a shelf, while those of *G. minimus* have a blunt heel and a well developed toe, but no shelf. The figures for *G. minimus* given above are taken from Ergens (1966), Malmberg (1970) pointing out the importance of marginal hook shape in the taxonomy of the genus *Gyrodactylus* Nordmann, 1832.

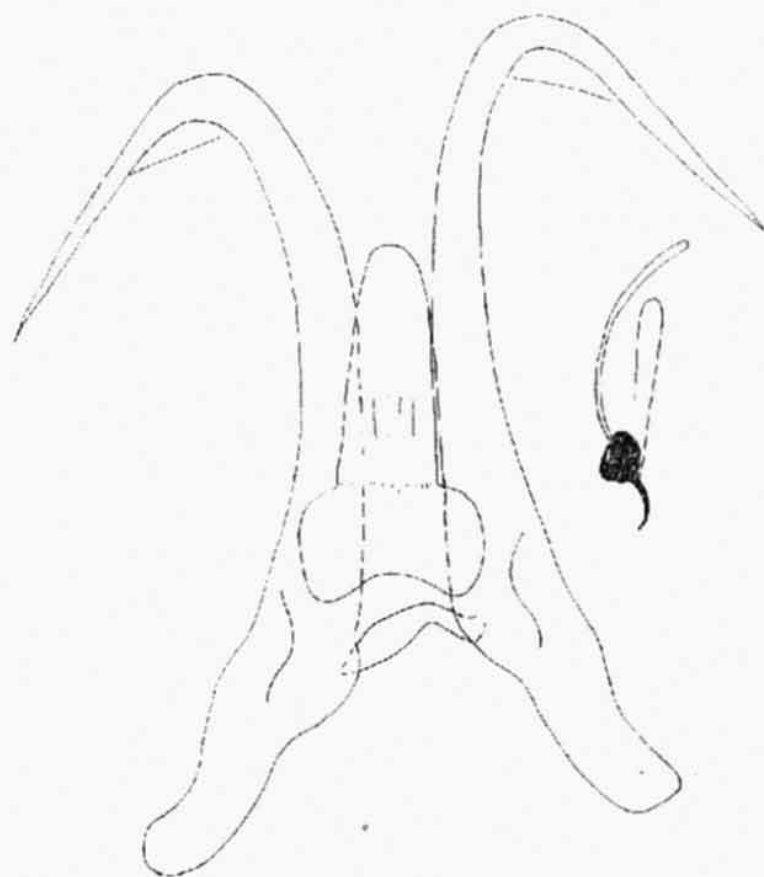


Fig. 2. Anchor complex and marginal hook of *Gyrodactylus aquilinus* sp. n.

B. *Gyrodactylus phoxini* group

Diagnosis: After Malmberg (1970)

1. *G. aquilinus* sp. n.

(Fig. 2)

Host: **Catostomus catostomus* (Forster). Location: *Fins. Locality: *Grand Lake (53°35'N, 60°15'W). Incidence and intensity of infection: Six fish infected (15 percent) with one to seven helminths. (av. 3.0). Number measured: Ten. Holotype: USNM Helm. Coll. No. 70744.

Description (Holotype (Paratypes)): Overall length 672 (530—672), width 96 (60—96); pharynx 33 (32—39) long, anterior width 27 (24—27), posterior width 34 (28—34). Cirrus 12 (12—13) in diameter. Haptor 96 (96—120) long, 132 (96—144) wide. Anchors 62 (61—62), base 47 (45—47), point 26 (25—27), inner root 21 (20—21). Ventral bar 8 (8) long by 16 (15—17) wide. Dorsal bar 3 (2—3) by 10 (9—12). Membrane 19 (16—19) long. Marginal hooks 22 (22), hooklets 6 (6) long.

Remarks: The only species of the *G. phoxini* group described to date in North America is *Gyrodactylus lingulatus* Rogers, 1968. *G. aquilinus* sp. n. differs from this and all other members of the *G. phoxini* group in the size of its haptoral parts and the shape of its marginal hooks.

SUBGENUS G. (MESONEPHROTUS) Malmberg, 1964

***Gyrodactylus arcuatus* group**

Diagnosis: After Malmberg (1970)

1. *G. stunkardi* Kritsky and Mizelle, 1968

(Fig. 3)

Host: *Rhinichthys cataractae* (Valenciennes). Location: Fius. Locality: Grand Lake (53°35'N, 60°15'W). Incidence and intensity of infection: Four fish infected (80 percent) with one to eight helminths (av. 3.0). Number measured: Ten. USNM Helm. Coll. No. 70739.

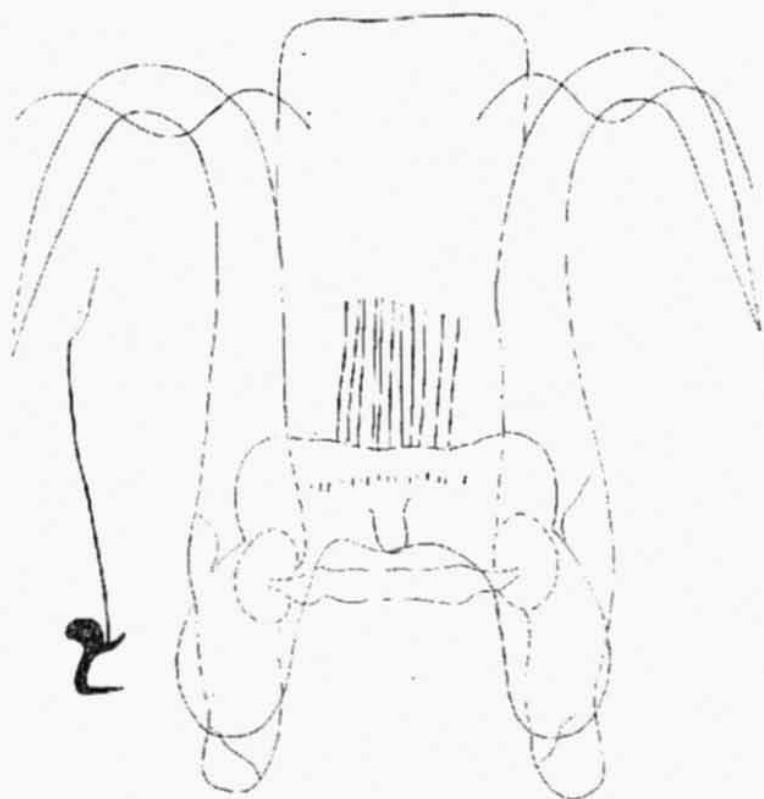


Fig. 3. Anchor complex and marginal hook of *Gyrodactylus stunkardi* Kritsky et Mizelle, 1968.

Measurements: Overall length 576—720, width 84—108; pharynx 65—71 long, anterior width 32—49, posterior width 41—56. Cirrus of *G. arcuatus* group type, 17—19 in diameter. Haptor 96—120 long, 132—156 wide. Anchors 65—67, base 47—49, point 27—28, inner root 19—20. Ventral bar 8—9 long and 28—31 wide, lateral extension of this bar 15—16 by 9—10. Dorsal bar 2—3 by 19—21. Membrane 37—39 long. Marginal hooks 35—37, hooklets 6 long.

Remarks: Kritsky and Mizelle (1968) described this species from the external surface of *Catostomus occidentalis* Ayres, taken from the Salinus River, San Lucas, California. The present specimens are generally larger than those of Kritsky and Mizelle (1968) but not as large as those recovered by Hanck and Fernando (1971) from *Rhinichthys atratulus* Agassiz (should be (Hermann), see Bailey et al. 1960), *R. cataractae*, and *Etheostoma nigrum* Rafinesque in Ontario.

2. *G. atratuli* Putz and Hoffman, 1963

(Fig. 4)

Host: *Catostomus catostomus* (Forster). Location: Fins. Locality: Grand Lake (53°35'N, 60°15'W). Incidence and intensity of infection: Two fish infected (5 percent) with one to six helminths (av. 3.5). Number measured: Ten. USNM Helm. Coll. No. 70745.

Measurements: Overall length 620—720, width 72—96; pharynx 46—59 long, anterior width 42—50, posterior width 40—48. Cirrus 16—19 in diameter. Haptor 100—120 long, 132—144 wide. Anchors 57—59, base 44—45, point 28—29, inner root 14—16. Ventral bar 8 long and 31—32 wide, lateral extension of this bar 13—14 by 7—8. Dorsal bar 2—3 by 25—26. Membrane 24—26 long. Marginal hooks 28—29, hooklets 5 long.

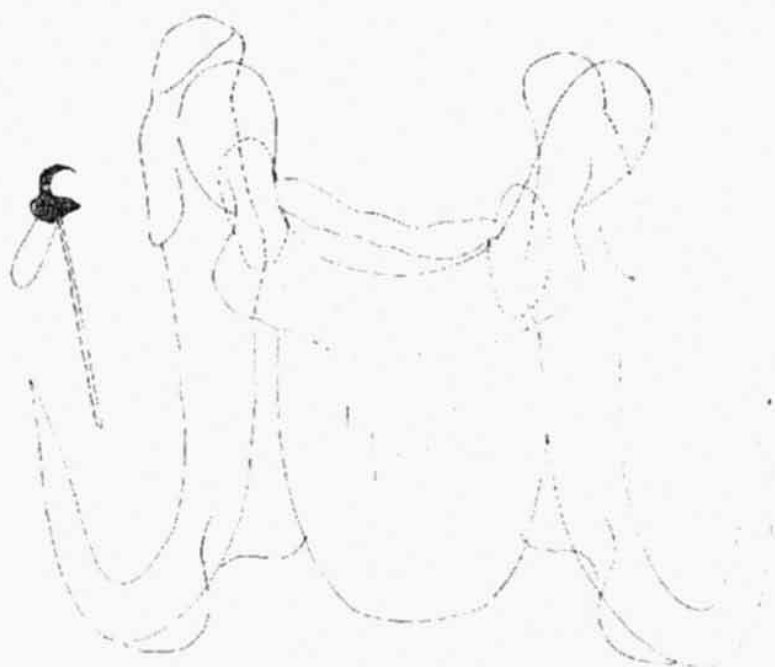


Fig. 4. Anchor complex and marginal hook of *Gyrodactylus atratuli* Putz et Hoffman, 1963.

Remarks: This species was described from the skin of *R. atratulus* and *Semotilus margarita* (Cope), taken from the south branch of Leetown Run, Leetown, West Virginia (Putz and Hoffman 1963). The present material is larger in most respects (overall length, pharynx, cirrus, ventral bar, dorsal bar) and smaller in some (anchors and marginal hooks) than those of Putz and Hoffman (1963), and resembles closely the specimens of the same species, recovered from the fins of *R. cataractae* by Hanek and Fernando (1971) in Ontario.

The present recovery represents a new host record.

SUBGENUS *G.* (METANEPHROTUS) Malmberg, 1964

A. *Gyrodactylus eucaliae* group

Diagnosis: After Malmberg (1970)

1. *G. commersoni* sp. n.

(Fig. 5)

Host: **Catostomus commersoni* (Lacépède). Location: *Gills. Locality: *Grand Lake (53°35'N, 60°15'W). Incidence and intensity of infection: Two fish infected (40 percent) with three to eighteen helminths (av. 10.5). Number measured: Ten. Holotype: USNM Helm. Coll. No. 70746.

Description (Holotype (Paratypes)): Overall length 672 (481—720), width 120 (78—120); pharynx 48 (40—53) long, anterior width 31 (29—34), posterior width 41 (36—43). Cirrus 16 (13—16) in diameter. Haptor 108 (95—120) long, 144 (118—144) wide. Anchors 56 (56—58), base 48 (47—48), point 21 (20—22), inner root 17 (15—17). Ventral bar 5 (5—6) long and 25 (24—26) wide, lateral extension of bar 6 (6—7) by 4 (3—4). Dorsal bar 2 (2) by 23 (21—23). Membrane 19 (19—21) long. Marginal hooks 26 (26) long, hooklets 5 (5) long.

Remarks: The nearest apparent relative of *Gyrodactylus commersoni*, which is named after the genus of fish from which it was described, is *G. eucaliae* Ikezaki and Hoffman, 1957, the former differing from the latter species in the morphology of the anchors, bars, hooks and cirrus (Figs. and Ikezaki and Hoffman 1957, fig. 2).

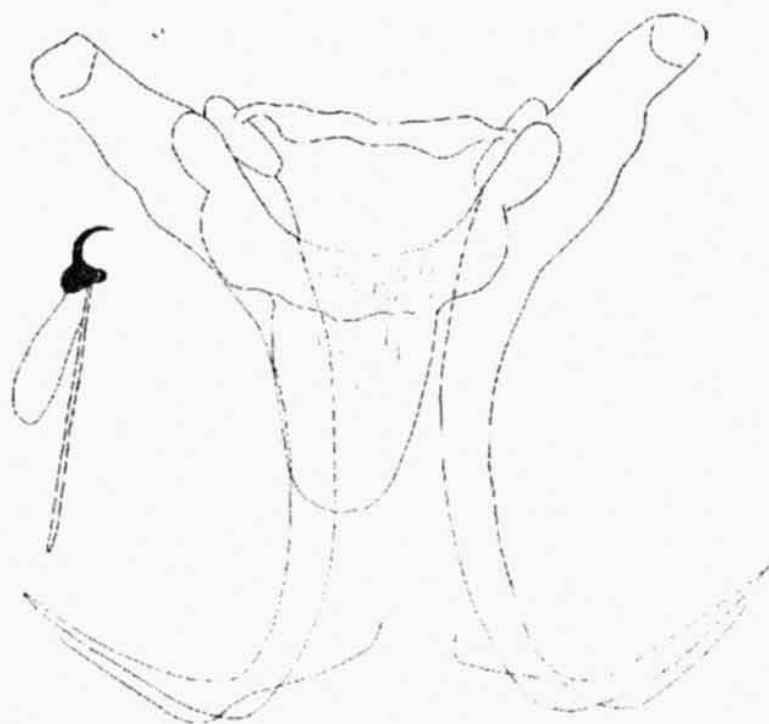


Fig. 5. Anchor complex and marginal hook of *Gyrodactylus commersoni* sp. n.

B. *Gyrodactylus harengi* group

Diagnosis: After Malmberg (1970)

1. *G. plumbeae* sp. n.

(Fig. 6)

Host: **Hybopsis plumbea* (Agassiz). Location: *Gills. Locality: *Naskaupi River (53°35'N, 60°54'W). Incidence and intensity of infection: One fish infected (3.3 percent) with twenty-four helminths. Number measured: Fifteen. Holotype: USNM Helm. Coll. No. 70738.

Description (Holotype (Paratypes)): Overall length 444 (348—560), width 120 (94—135); pharynx 52 (45—60) long, anterior width 40 (38—45), posterior width 44 (40—46). Cirrus 13 (14—16) in diameter. Haptor 72 (68—82) long, 84 (74—90) wide. Anchors 39 (37—39) base 31 (30—32), point 13 (12—13), inner root 16 (14—16). Ventral bar 6 (5—6) long by 12 (11—13) wide. Dorsal bar 1 (1—2) by 11 (10—12). Membrane 5 (5—6) long. Marginal hooks 17 (16—17) long, hooklets 4 (4) long.

Remarks: The morphology of the anchors, bars, and marginal hooks of this species resemble closely those of the *G. harengi* group. Differences were noted in the length of

the inner root, which is in our specimens slightly longer and in the size of the dorsal and ventral bars and marginal hooks. This species was named after the species of fish from which it was recovered.

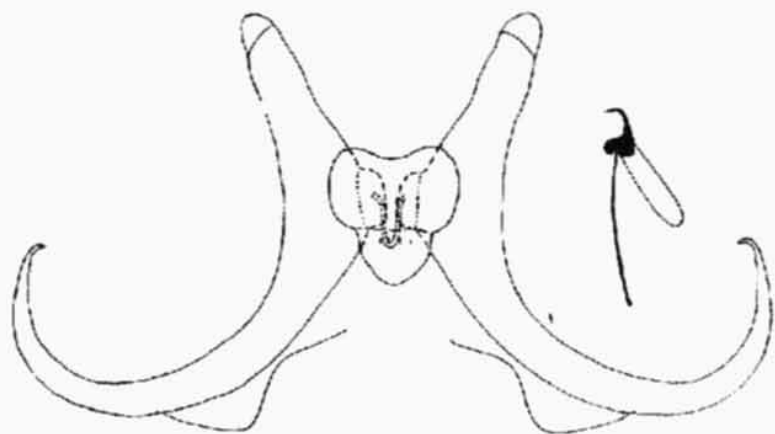


Fig. 6. Anchor complex and marginal hook of *Gyrodactylus plumbeae* sp. n.

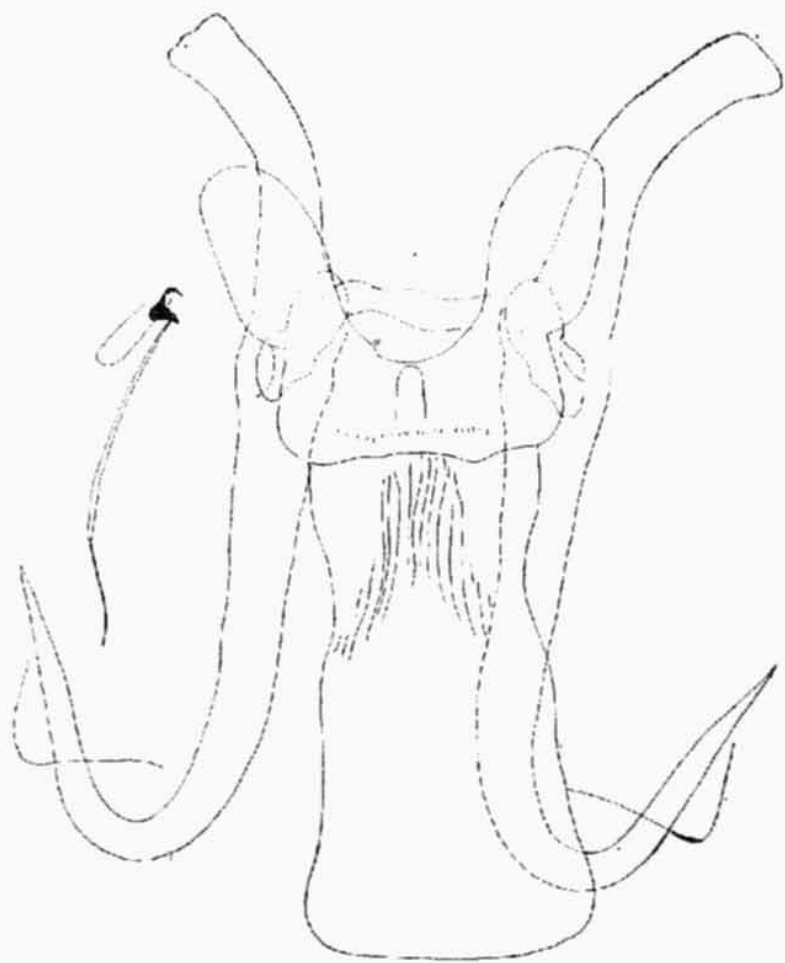


Fig. 7. Anchor complex and marginal hook of *Gyrodactylus spathulatus* Mueller, 1963.

Gyrodactylus spathulatus Mueller, 1936

(Fig. 7)

Host: *Catostomus catostomus* (Foerster). Location: Fins. Locality: Grand Lake. Incidence and intensity of infection: Four fish infected (10 percent) with one to seven helminths (av. 2.7). Number measured: Ten.

Description: Overall length 500—710, width 90—111; pharynx 40—60 long, anterior width 35—55, posterior width 38—54. Cirrus 15—27 in diameter. Haptor 138—182 long, 167—180 wide. Anchors 124—130, base 85—91, point 40—43, inner root 43—46. Ventral bar 14—16 long and 44—46 wide. Lateral extensions of this bar are 28—30 by 16—17. Membrane 75—80. Dorsal bar 5 by 28—30. Marginal hooks 51—55, hooklets 6—7 long.

Remarks: This constitutes a new host record, the species formerly having been found on *C. commersoni* (Mueller 1936; Krueger 1954).

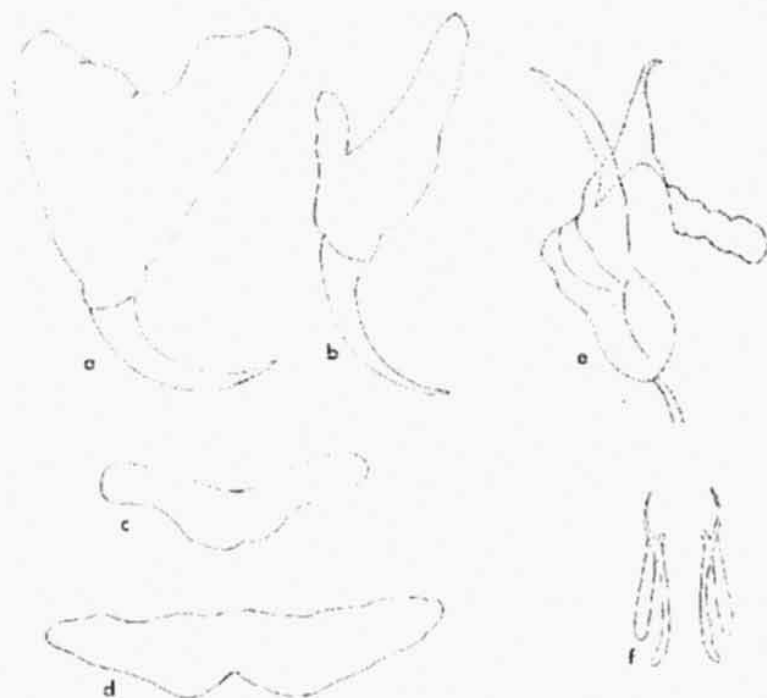


Fig. 8. *Cleidodiscus brachus* Mueller, 1938 (a) ventral anchor (b) dorsal anchor (c) dorsal bar (d) ventral bar (e) copulatory complex (f) marginal hooks.

Cleidodiscus brachus Mueller, 1938

(Fig. 8)

Host: *Hybopsis plumbea* (Agassiz). Location: Gills. Locality: Naskaupi River (53°35'N, 60°54'W). Incidence and intensity of infection: Thirteen fish infected (86 percent) with one to twenty-four helminths (av. 4.7). Number measured: Fifteen. USNM Helm. Coll. No. 70740.

Measurements: Overall length 720—1210, width 154—210. Pharynx 90—99 by 78—96. Copulatory organ 30—35. Ventral anchors 43—45, apical part 30—32, base 20—21, inner root 19—21, outer root 8—10, point 20—22. Connecting bar 8—9 by 36—39. Dorsal anchors 39—43, base 8—9, inner root 17—19, outer root 7—9, point 18—20. Connecting bar 4—5 by 25—27. Marginal hooks typical and varying from 15—22 in length.

Remarks: Originally described from the gills of *Semotilus atromaculatus* (Mitchill) taken from the French Creek near Panama, N. Y. by Mueller (1938), this species has since been reported only twice (Mueller (1938) from the gills of *S. margarita* (Cope),

same locality; Mizelle and Klucka (1953) from the gills of *S. atromaculatus*, Wisconsin). The measurements of the present material are within the range given in the original description. The present material represents a new host record for this species.

Anonchohaptor anomalum Mueller, 1938

(Fig. 9)

Hosts: *Catostomus catostomus* (Forster), *C. commersoni* (Lacépède). Location: Gills. Locality: Grand Lake (53°35'N, 60°15'W), Eagle River (53°35'N, 57°27'W). Incidence and intensity of infection: Four fish infected (9 percent) with one to ten helminths (av. 4.0). Number measured: Ten. USNM Helm. Coll. No. 70748.

Measurements: Overall length 1800—2210, width 310—375. Pharynx 180—228 by 210—252. Cirrus 56—59. Haptor 204—272 by 320—360. Marginal hooks uniform in size and shape 17 long.



Fig. 9. *Anonchohaptor anomalum* Mueller, 1938 (a) copulatory complex (b) marginal hooks.

Remarks: Mueller (1938) described a new genus, *Anonchohaptor* with the type species *A. anomalum*. This species was recovered from the gills of *Catostomus commersoni*, *Hypentelium nigricans* (Le Sueur) and *Moxostoma duquesni*, (Le Sueur) taken from Chaufanqua Lake, N. Y. (Mueller 1938), and from *C. commersoni* taken in Wisconsin (Fischthal 1947). The measurements of the present material fall within the range given by Mueller (1938). The recovery from *C. catostomus* constitutes a new host record.

Acknowledgements. Thanks are due to the National Research Council of Canada for the grant (NRCC-A3500) that made this work possible, and to the Department of Fisheries and Forestry of Canada. I also thank George Hanek, my former Research Assistant and Messrs. F. J. Hicks and N. Duggan for their assistance.

НОВЫЕ И РАНЕЕ ОПИСАННЫЕ ВИДЫ МОНОГЕНЕТИЧЕСКИХ
ТРЕМАТОД ОТ РЫБ (CATOSTOMIDAE И CYPRINIDAE) ЛАБРАДОРА

У. Трелфалл

Резюме. В трех местностях Лабрадора во время августа—сентября 1969 г. собрано и обследовано 80 рыб, относящихся к 4 видам: *Hypopsis plumbea* (Agassiz) — 30, *Rhinichthys cataractae* (Valenciennes) — 5, *Catostomus catostomus* (Forster) — 40 и *Catostomus commersoni*

(Lacépède) 5. Эти рыбы оказались хозяевами следующих обнаруженных нами моногенетических трематод: *Gyrodactylus aldrichi* sp. n.; *G. aquilinus* sp. n.; *G. stunkardi* Kritsky et Mizelle, 1968; *G. atratuli* Putz et Hoffman, 1963; *G. commersoni* sp. n.; *G. plumbeae* sp. n.; *G. spathulatus* Mueller, 1936; *Cleidodiscus brachus* Mueller, 1938; *Anonchaptor anomalum* Mueller, 1938. В работе даны описания новых видов и также размеры и рисунки твердых частей всех обнаруженных видов.

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Received 30 May 1973.