1990

Binder 149, Opecoelidae O [Trematoda Taxon Notebooks]

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Opecoelina Manter, 1934
Syn. *Dideutosaccus* Acena, 1941

Generic diagnosis. — Allocreadiidae, Opecoelinae; Body elongate, more or less flattened. Oral sucker subterminal, prepharynx short or practically absent, esophagus moderately long, ceca united at posterior extremity and opening dorsoterminally. Testes tandem, in posterior half of body. Vesicula seminalis externa present. Cirrus pouch elongate, slender or claviform, containing internal seminal vesicle, prostatic complex and cirrus. Genital pore to left of esophagus. Ovary pretesticular, median or a little to right, in middle third of body. Receptaculum seminis and Laurer's canal present. Vitellaria extending along ceca in hindbody, may intrude into forebody. Uterus winding between ovary and acetabulum. Excretory vesicle reaching to level of ovary. Parasitic in intestine of marine fishes.

Genotype: *O. scorpaenae* Manter, 1934, (Pl. 11, Fig. 146), in *Scorpaena cristulata*; Florida.

Other species:

O. helicoleni Manter, 1934, in *Helicolenus dactylopterus*, *H. maderensis*; Florida.
O. pacifica Manter, 1940, in *Paralabrax* sp.; Galapagos.
O. pharyngomacna Vaucleroux, 1943, in *Sebastodes nebulosus*; California.
O. radiistadi Acena, 1941, in *Sebastodes elongatus*, Friday Harbor, Wash.
O. theragrae Lloyd, 1938, in *Theragra fucensis*; Puget Sound.

OPECOELINA Manter, 1934

Generic Diagnosis

Opecœlinæ with elongate, more or less flattened bodies. Ventral sucker preequatorial. Prepharynx short or absent; long esophagus; intestinal bifurcation at anterior border of ventral sucker; ceca uniting near posterior end; single, median, dorsal, subterminal anus. Genital pore to the left, anterior to intestinal bifurcation. Cirrus sac elongate, straight, slender, delicate, claviform, containing tubular, internal seminal vesicle and prostate gland. External seminal vesicle present, separated from cirrus sac by a narrow tube. Testes tandem, posterior to midbody. Ovary lobed or smooth, immediately anterior to testes. Seminal receptacle present. Laurer's canal present. Vitellaria from ventral sucker to posterior end. Eggs about 70 μ in length, thin-shelled. Excretory pore anterior to anus, dorsal. Excretory vesicle extending to ovary. Intestinal parasites of marine fish.

Type species—Opecœlina scorpænae.

Comparisons

This genus is most closely related to those included by Ozaki (1928b) in the Opecœlidæ, agreeing in general arrangement of reproductive organs, united ceca and single anus. It differs in possessing a seminal receptacle, in that the anus is dorsal and posterior to the excretory pore rather than ventral and anterior, and in that the cirrus sac is much better developed, inclosing a much larger portion of the seminal vesicle. In addition, it differs from *Opecœleus* in lacking marginal papillæ of the ventral sucker. The vitellaria do not extend so far forward as in *Opegaster*.

Other species · O. Helicolenı Manter, 1934
O. pacifica Manter, 1940
O. Theragrae Lloyd, 1938
O. pharynmagna Annereaux, 1943

Allocreadiidae

Opecoelidae

DIDEUTOSACCUS Acena, 1941

syn. of Opecoelina by Manter, 1947

Genus DIDEUTOSACCUS novum

Opecœlidæ: Body elongate, tapering towards anterior end. Cuticle smooth. Acetabulum sessile, larger than oral sucker, at posterior portion of first fourth of body length. Œsophagus very short. Genital pore sinistral, at level of pharyngoœsophageal junction. Cirrus sac small, pyriform, inclosing long tortuous seminal vesicle and prostate. External seminal vesicle absent. Testes tandem, postovarial, postequatorial. Ovary ovate, immediately anterior to testes. Seminal receptacle anterodorsal to ovary. Vitellaria in small follicles, extending from behind ventral sucker to posterior end of body. Two yolk reservoirs present, anterodorsal to ovary, united mesially by a common duct. Eggs fairly large, not numerous. Intestinal parasites of marine fish.

Type species.—Dideutosaccus radiatuli sp. nov.

Differs from other genera in "having two yolk reservoirs and in the complete enclosure of the seminal vesicle within the cirrus sac".

Subfamily Opecœlinæ

Opecœlina scorpænæ n.sp.

(Figs. 55-58)

Host—*Scorpæna cristulata* Goode & Bean.
Position—Ceca and intestine.
Frequency—Present in both of 2 hosts examined.
Depth—250 fathoms.

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Specific Diagnosis

Body smooth, elongate, more or less flattened, 1.67 to 2.2 mm. in length; width about ¼ length, tapering slightly anterior to ventral sucker, approximately equally wide posterior to ventral sucker, posterior end broadly rounded. Oral sucker subterminal; ventral sucker about 1/4 from anterior end, wider than long, with transverse aperture, almost exactly twice the diameter of oral sucker, seemingly not protuberant but more or less embedded in the body and surmounted anteriorly by a broad fold of the body wall, perhaps capable of being protruded; no evidence of marginal papillæ or processes on ventral sucker or its fold. Prepharynx lacking or very short; muscular esophagus almost as wide as pharynx and twice as long; intestinal bifurcation at anterior edge of ventral sucker; ceca extending to near the posterior end where they unite forming a short rectum and open to the outside through an anus. Anus dorsal and posterior to the excretory pore. Both pores open into a depression of the body wall. Genital pore to the left, about halfway between the midline and the body edge, at mid-esophagus level. Testes median, tandem, usually somewhat lobed but sometimes almost smooth, close together or not far apart, immediately posterior to midbody, not separated by vitellaria.[1] Cirrus sac long, straight, slender, not very strongly developed, leading diagonally backward from genital pore to posterior edge of ventral sucker, gradually increasing to a greatest diameter near its base, containing a tubular, internal, seminal vesicle, only slightly coiled, and an evident, but poorly developed, prostate gland. Cirrus often inserted into the metraterm of the same individual. External seminal vesicle conspicuous, sac-shaped or slightly curved, extending almost directly backward almost halfway to the ovary, dorsal to the uterus, connected with cirrus sac by a tubular, narrow region. Ovary large, usually 3-lobed, although the lobes are indistinct in some cases, extended transversely, immediately in front of anterior testis. Seminal receptacle and yolk reservoir dorsal to ovary. Laurer's canal opening dorsally to the left of median line. Vitelline follicles large, extending in the sides of body from posterior edge of ventral sucker to posterior end of body, dorsal and ventral to ceca, confluent behind testes but not impinging between the gonads, usually continuous but may be slightly interrupted opposite the testes. Uterus coiling between ovary and ventral sucker. Eggs 70 to 78 by 39 to 47 μ, with thin shells which become yellow in color. Excretory pore dorsal, subterminal, immediately anterior to anus; excretory vesicle extending to ovary.

[1] Three abnormal specimens were collected from one host. In one, the anterior testis was absent (fig. 55); in another the posterior testis was absent (fig. 56) and in a third the vitellaria in midbody region were greatly hypertrophied.

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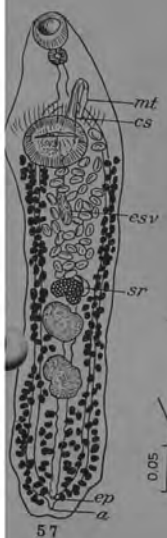
Measurements

Length	Width	Oral sucker	Ventral sucker	Forebody	Post-testicular area	Eggs
mm.	mm.	mm.	mm.	mm.	mm.	μ
1.99	0.498	0.158	0.320	0.348	...	70 by 40
2.2	.412	.137	.285	.428	0.546	76 39
1.93	.504	.153	.295	.520	.404	72 39
1.67	.445	.127	.260	.352	.412	76 43
1.74	.420	.133	.268	.361	.386	72 43
1.74	.588	.127	.294	.428	.310	78 47



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Opecoelina helicoleni Manter 1934

Opecœlina helicoleni n.sp.

(Figs. 59-60)

Host—*Helicolenus dactylopterus* (de la Roche).
Position—Intestine.
Frequency—Present in 1 of 21 hosts examined.
Depth—197 fathoms.

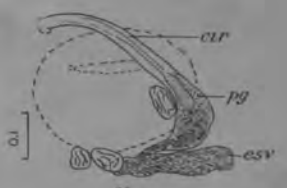
Specific Diagnosis

Body elongate, narrow, 2.58 to 3.59 mm. in length; 0.504 to 0.592 mm. in width; slight, lateral indentations just posterior to ventral sucker and opposite testes. Oral sucker terminal, round; mouth ventral, subterminal; ventral sucker about 1/5 from anterior end, a little over twice the diameter of oral sucker, wider than long, embedded in the body, with a muscular, lip-like fold of the body wall at anterior border. Short prepharynx; esophagus a little over twice the length of pharynx; narrow ceca uniting near the posterior end. A narrow, median, subterminal, dorsal depression indicates that the relation of the anus and excretory pore are as in *O. scorpænæ*. Genital pore to the left, slightly in advance of intestinal bifurcation, opposite posterior part of esophagus, nearer the ventral than the oral sucker. Testes rounded, smooth, tandem, median, separated by a short distance, the anterior testis about in midbody; posttesticular portion of body over three times the length of posterior testis, much longer than forebody. Cirrus sac extending to posterior border of ventral sucker. External seminal vesicle may extend 1/3 the distance to ovary (fig. 59), or may lie almost horizontally near the ventral sucker (fig. 60); internal seminal vesicle tubular, slightly coiled, prostate gland fairly well developed, cirrus long and slender. Ovary distinctly 4-lobed, the anterior lobe being the portion of more mature ova. Yolk reservoir and sac-shaped seminal receptacle at dorsal, anterior border of ovary. Laurer's canal present, opening dorsally to the left of median line. Uterus between ovary and ventral sucker. Vitelline follicles large, rounded, in the sides of body from posterior edge of ventral sucker to extreme posterior tip of body, dorsal and ventral to ceca, interrupted opposite testes, almost meeting medianly between testes, more or less filling hindbody posterior to testes. Eggs thin-shelled, light yellow, 72 to 74 by 41 to 42 μ. Excretory vesicle extends to ovary.

Measurements

Length	Width	Oral sucker	Ventral sucker	Forebody	Post-testicular area	Eggs
mm.	mm.	mm.	mm.	mm.	mm.	μ
2.584	0.592	0.151	0.361	0.310	0.950	72 by 41
3.59	.504	.147	.344	.550	1.202	74 41-42

59



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Comparisons

It seemed almost possible at first to include this form as elongate specimens of *Opecœlina scorpænæ* with which it agrees in many details. The following differences, however, taken together serve to separate the species from *O. scorpænæ*. The body is more elongate and narrow; the ventral sucker is more anterior; the genital pore is more posterior; the post-testicular portion is much longer; the testes show no indication of lobing and are somewhat separated by vitellaria; the external seminal vesicle does not extend so far posteriorly; and the prostate gland is better developed.

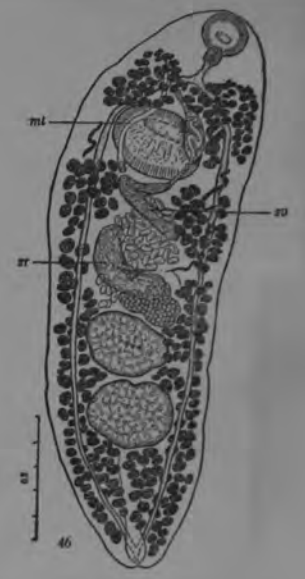
The description of *O. helicoleni* is based on a study of two specimens.

Both of the above species of *Opecœlina* are named for their hosts. They serve as two more examples of deep-water trematodes whose nearest relatives, so far as are described, occur in distant waters.

Opecoelina pacifica, ~~new species~~ MANTER, 1940

(Plate 38, figs. 46, 47)

Host: Paralabrax species (?)
Location: Intestine and ceca
Locality: Albemarle Island, Galapagos
Number: 15 from a single host



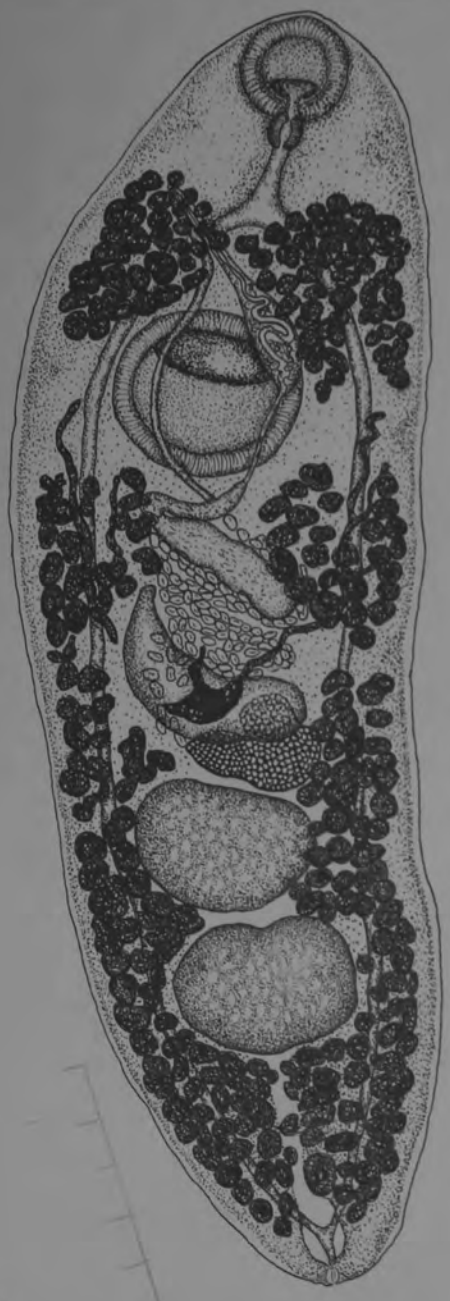
SPECIFIC DIAGNOSIS OF OPECOELINA PACIFICA

Body smooth, flattened, elongated, tapering to a rounded point at each end, 1.404 to 2.130 in length, 0.607 to 0.945 in width, widest near acetabulum. Oral sucker 0.157 to 0.217 in transverse diameter; acetabulum 0.330 to 0.465 in transverse diameter, without papillae; sucker ratio approximately 1:2. Pharynx 0.082 to 0.112 by 0.067 to 0.087; esophagus about same length as pharynx; intestinal bifurcation about midway between suckers; rectum short; anus terminal or subterminal, immediately ventral to excretory pore. Genital pore well to the left (halfway or more toward the left side of the body), varying from a level opposite base of esophagus to opposite base of pharynx. Testes tandem, close together, in posterior half of body, ovoid, slightly wider than long, smooth or (more often) slightly lobed, a median indentation being common. Cirrus sac well developed with a long slender cirrus portion which widens abruptly to form a swollen posterior portion containing a sinuous, narrow, tubular internal seminal vesicle and prostatic cells (fig. 47). Cirrus often protruded. Posterior portion of cirrus sac overlapping acetabulum at least slightly, usually about to its middle, sometimes to its posterior edge. External seminal vesicle a wide tube, bent once near its middle; its anterior part extending diagonally to the left, its posterior part extending diagonally to the right; extending posteriorly to level of ovary or perhaps only halfway from acetabulum to ovary; connected to cirrus sac by a slender, almost straight, somewhat sinuous tube.

Ovary 3- or 4-lobed, immediately pretesticular. Uterus, Mehlis' gland, yolk reservoir, Laurer's canal, and seminal receptacle preovarian. Seminal receptacle a large, elongate sac, the posterior end of which may overlap ovary. Vitellaria from posterior end of pharynx to posterior end of body, interrupted opposite acetabulum, confluent or almost so dorsally anterior to acetabulum; in hindbody follicles are chiefly lateral, median, and ventral to ceca with very few dorsal follicles. Eggs yellow, thin-shelled, 54 to 68 by 31 to 36 μ. Excretory pore terminal immediately dorsal to anus; excretory vesicle extending dorsal to testes to level of ovary.

Comparisons. This species differs from all others in the genus (*O. scorpaenae* Manter, *O. helicoleni* Manter, *O. theragrae* Lloyd) in much more anterior extent of vitellaria. Other specific characters could be noted. The genus Opecoelina is to be separated from Opecoelus and Opegaster by the presence of a seminal receptacle.

FROM: ALLAN HANCOCK PACIFIC EXPEDITIONS, VOL. 2, No. 14



Opecoelina pacifica

Reprinted from THE JOURNAL OF PARASITOLOGY, April, 1943, Vol. 29, No. 2, pages 155–156.

OPECOELINA PHARYNMAGNA N. SP. (TREMATODA) FROM THE CHINA ROCKFISH

On August 8, 1938, a single specimen of a trematode of the genus *Opecoelina*, family Allocreadiidae, was found in the dissecting dish containing the stomach and intestine of a China rockfish, *Sebastodes nebulosus*. The host was taken from the Pacific Ocean, near Fort Ross, California.

The genus *Opecoelina* was erected by Manter (1934, Carnegie Inst. Wash. Pub. 435, Papers Tortugas Lab. 28: 257–345), based upon the descriptions of two new species, *Opecoelina scorpaenae* and *O. helicoleni*. A third species, *O. theragrae*, was added to the genus by Lloyd (1938, J. Parasitol. **24**: 103–133). The specimen from the China rockfish appears to represent an undescribed species. For this trematode, the name *Opecoelina pharynmagna*, is proposed.

Opecoelina pharynmagna n. sp.
(Fig. 1.)

Body smooth, elongate, tapering at both extremities; length 3.6 mm. Body length can be separated into four approximately equal portions or units. First unit extends from oral sucker to posterior border of acetabulum; second unit extends to anterior margin of ovary and contains uterus; third unit extends to region just posterior to testes and contains the gonads; fourth unit extending to posterior end of body, occupied largely by posterior vitellaria.

FIG. 1. *Opecoelina pharynmagna* n. sp., ventral view.

Greatest width, 0.53 mm through acetabular region. Behind acetabulum body constricts abruptly; at this point body width measures 0.4 mm; from this point lateral margins remain parallel to region of ovary and then gradually taper to posterior extremity.

Oral sucker terminal, mouth ventral, length 0.179 mm, width 0.162 mm; acetabulum wider than long, width 0.36 mm, length 0.3 mm. Prepharynx very short; pharynx nearly as large as oral sucker (0.136 mm × 0.125 mm); esophagus shorter than pharynx. Intestinal bifurcation approximately 0.14 mm from anterior border of acetabulum; ceca unite in posterior end of body to form short rectum. Anal opening could not be ascertained with certainty; due to expanded character of ceca in this region, it was not, at first, recognized that union existed.

Testes elongate, roughly oval, tandem, approximately 0.27 mm long and 0.185 mm wide. Ovary, four lobed, its posterior margin approaching anterior testis, its anterior margin marking equator of two body halves. Seminal receptacle and yolk reservoir dorsal, and to left of ovary; small portion of seminal receptacle overlapping margin of ovary. Laurer's canal present and to left of mid-line. Vitellarian follicles large and round, extending from point just back of acetabulum, to posterior tip of body, filling all available space, with exception of small area at ovarian level. Cirrus pouch long, sinuous, passing to the left of the acetabulum and ending in the midline, 0.256 mm behind acetabulum. Seminal vesicle enclosed by cirrus sac. Genital pore to left and slightly anterior to bifurcation of ceca. Uterus confined to intracecal area between ovary and acetabulum. Eggs measure 77–92 microns × 43–52 microns.

Host: Sebastodes nebulosus (Ayres).

Habitat: Stomach or intestine.

Locality: Fort Ross, California.

Type specimen: U. S. Nat. Mus. Helm. Coll. No. 36866.

Opecoelina pharynmagna presents many characteristics similar to the other members of the genus. In body size and form it is very similar to *O. helicoleni* Manter and *O. theragrae* Lloyd. It differs from all the other species in having a very large pharynx, which is nearly equal to the size of the oral sucker, and a much shorter oesophagus. Like *O. theragrae*, the seminal vesicle is enclosed in the cirrus pouch, whereas an external seminal vesicle is present in *O. helicoleni* and *O. scorpaenae*.—R. F. ANNEREAUX, *Animal Pathology Laboratory, California State Department of Agriculture.*

Dideutosaccus radifistuli Acena, 1941

"Body small, elongate, tapering towards anterior end, 3.5 to 4 mm. long and 0.45 to 0.5 mm. in maximum width across the anterior testis. Cuticle fairly thick, smooth, and thrown into folds in contracted specimens. Preacetabular region 2. to 2.5 mm. Posttesticular region 0.62 mm. Suckers small; ventral sucker twice as large as oral. Oral sucker subterminal, 0.15 by 0.14 mm. Ventral sucker sessile, almost ovate, 0.36 by 0.27 mm. Prepharynx absent; pharynx somewhat fusiform, muscular, 0.015 by 0.007 mm. Œsophagus short, 0.006 by 0.002 mm. Intestinal crura simple, without lateral branches, uniting at posterior end to open on ventral surface near posterior extremity.

Excretory pore terminal. Excretory vesicle tubular, running forward through testicular region to about posterior margin of anterior testis. Two fine branches arising from the rather enlarged anterior end.

Testes almost ovate, one behind the other on the median line; posterior testes larger than anterior organ. Anterior testis 0.19 by 0.27 mm. Posterior testis 0.28 by 0.26 mm. Seminal receptacle anterodorsal to ovary, short-ovate, cirrus small, muscular and pyriform, 0.06 by 0.04 mm, inclosing elongate, tortuous seminal vesicle and pars prostatica. External seminal vesicle absent. Genital pore sinistral, at level of pharyngoœsophageal junction.

Ovary ovate, median, overlapping anteroventral surface of anterior testis, 0.11 by 0.24 mm. Two oblong yolk reservoirs present, one on each side of anterior border of ovary. Cotype and Mehlis glands anterior to ovary, between yolk reservoirs. Uterine coils intercæcal, between shell gland and acetabulum. Metraterm short and muscular. Laurer's canal present. Eggs 0.07 by 0.03 mm. Vitelline follicles extending from behind posterior margin of acetabulum to posterior extremity of the body and uniting behind testis.

Host.—*Sebastodes elongatus* Ayres.

Location.—Rectum.

Locality.—Friday Harbor, Washington.

Type species.—Acena Helminthological collection No. 34.

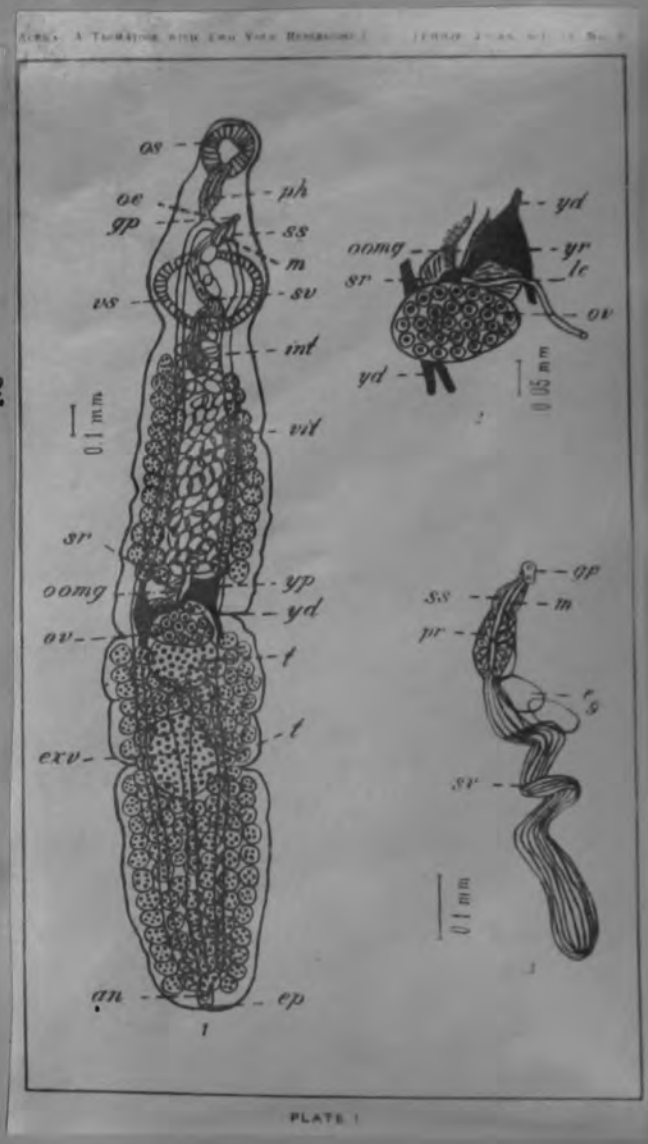


PLATE I

Allocreadiidae

Opecoelina theragrae Lloyd, 1938

Length: 3.0 to 4.0 mms.

Width: 0.5 mms. greatest width

Oral sucker: 0.17 mms. in diameter.

Acetabulum: (size:) Appreciably less than twice dia. of oral sucker.
(position): 1/7 to 1/10 body length from anterior end.

Sucker ratio: Less than 1:2.

Esophagus: Twice length of pharynx.
Pharynx: Present.

Genital pore (location): To left to left just behind pharyngeal level.

Testes, shape: Elongate oval.

location: Tandem, just posterior to midbody.
Cirrus sac (extent): Half way to ovary.
Ovary, shape: Four-lobed.

location: Pretesticular.

Vitellaria: Broken opposite testes and coming together between and behind them.

Eggs: 88-92 by 46-50 μ.

Other features:

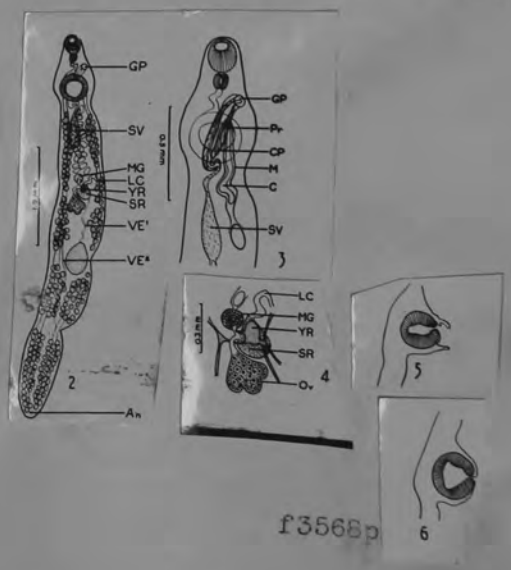
Host: Theragra fucensis (Jordan and Gilbert)

Locality: Seattle, Washington

Reference: Journal of Parasitology, Vol. 24, pages 103-133. 1938.

Comparisons: O. helicoleni Manter
O. scorpaenae Manter

Life cycle:



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OPECOELINA

Opecoeloides Odhner, 1928

Generic diagnosis. — Allocreadiidae, Opecoelinae: Body elongate, unarmed. Oral sucker ventroterminal, large, followed by prepharynx; pharynx well developed, ceca opening into excretory vesicle at posterior extremity. Cloacal aperture terminal or dorsoterminal. Acetabulum pedunculate, near anterior extremity, with six tentacular finger- or horn-like projections on free margin, and an accessory sucker between base of its peduncle and genital pore. Testes tandem, median, in posterior half of body. Vesicula seminalis tubular, extending further back of base of acetabular peduncle. No cirrus pouch. Genital pore in front of base of acetabular peduncle, a little to left. Ovary pretesticular, median. No receptaculum seminis. Uterus coiled between ovary and acetabulum. Vitellaria circumcecal, in hindbody, occupying entire posttesticular region. Anterior extent of excretory vesicle? Parasitic in stomach and intestine of marine fishes.

Genotype: *O. furcatus* (Brems. in Rud., 1819) Odhner, 1928, in *Mullus surmuletus*, *M. rubescens*, Arimini. Also in *Mullus barbatus*, Castiglione, *Gadus molva*, Naples and [*Parupeneus chrysedros*, Naha, Okinawa. PROVISIONAL REPORT BY YAMAGUTI, 1942.]

Other species:

O. brachyteleus Manter, 1947 (Pl. 10, Fig. 121), in *Mulloidichthys martinicus;* Florida.

O. elongatus Manter, 1947, in *Pseudupeneus maculatus;* Florida.

O. eucinostomi (Manter, 1940) (syn. *Anisoporus e.* M.) in *Eucinostomus californiensis;* Colombia and *Polynemus approximanus;* Panama.

O. manteri (Hunninen et Cable, 1940) [1]) in *Syngnathus fusca*, *Paralichthys dentatus*, *Hippoglossoides platessoides*, *Apeltes quadracus*, *Fundulus heteroclithus* and *F. majalis;* Cape Cod.

Cercaria develops in sporocyst in marine snail, *Mitrella lunata*, encysts in marine amphipod, *Carinogammarus mucronatus* and *Amphithoe longimana;* adult in several species of marine fish. — Hunninen and Cable (1941).

O. polyfimbriatus Read, 1947, in *Synodus foetens;* Texas.

O. polynemi von Wicklen, 1946, in *Polynemus octonemus;* Gulf of Mexico.

O. thyrinopsi (Manter, 1940) (syn. *Anisoporus t.* M.) in *Thyrinops pachylepis;* Colombia.

O. vitellosus (Linton, 1900) (syn. *Cymbephallus v.* L.) in *Alosa*, *Ammodytes*, *Clupea*, *Cynoscion*, *Decapterus*, *Lagodon*, *Conger*, *Limanda*, *Leiostomus*, *Lophopsetta*, *Menticirrhus*, *Mullus*, *Palinurichthys*, *Paralichthys*, *Urophycis*, *Pomatomus*, *Pomalobus*, *Poronotus*, *Merlinus*, *Pseudopleuronectes*, *Sarda*, *Scomber*, *Syrictes*, *Spheroides*, *Stenotomus*, *Tautoga*, *Tautogolabrus*, *Trachinotus*, *Trachuropus;* Woods Hole.

[1]) *O. manteri* (Hunninen et Cable, 1940) may probably be identical with *O. vitellosus* (Linton, 1900).

Fimbriatus von Wicklen, 1946
syn. *Cymbephallus* Linton, 1934, partim

Generic diagnosis. — Allocreadiidae, Opecoelinae. Body elongate or cylindrical, tapered toward anterior extremity, unarmed. Oral sucker subterminal, followed by short prepharynx. Esophagus of moderate length. Each cecum opening separately to the outside. Acetabulum pedunculate, with fimbriated lobes. Testes tandem, postequatorial. No cirrus pouch. Vesicula seminalis tubular, long, winding, free in parenchyma, extending some distance back of acetabulum. Prostate gland lacking. Genital pore on the left of pharynx or esophagus, with accessory sucker behind. Ovary pretesticular, median. No receptaculum seminis. Laurer's canal? Uterus winding forward in intercecal field from shell gland. Vitellaria extending along ceca from behind acetabulum to posterior extremity, leaving anterior portion of intestine free. Excretory vesicle tubular, reaching to ovary. Parasitic in digestive tract of marine fishes.

Genotype: *F. fimbriatus* (Linton, 1934), syn. *Cymbephallus f.* L., (Pl. 11, Fig. 138) in *Menticirrhus saxatilis* and *M. americanus*, Woods Hole; *Bairdiella chrysura* and *Sciurus ocellatus*; Beaufort. Also in *Coelorhynchus carinatus* and *Chalinura occidentalis*, Florida.

Key to species of *Opegaster* from Hawaiian fishes

1. Acetabulum well apart from anterior extremity; Laurer's canal opening middorsally some distance posterior to acetabulum. . . . . *O. iniistii*
   Acetabulum near anterior extremity 2
2. Acetabular papillae 3-7 on each margin; Laurer's canal opening almost middorsally slightly anterior to left end of ovary, forming almost complete loop . . . . . *O. hawaiiensis*
   Acetabular papillae usually of 4 pairs 3
3. Vitellaria commencing at pharyngo-esophageal level; ovary median; Laurer's canal not looped distally . . . . . *O. bothi*
   Vitellaria commencing at esophago-acetabular level; ovary median; Laurer's canal U-shaped distally . . . . . *O. dactylopteri*
   Vitellaria commencing at esophageal level; ovary submedian
   Laurer's canal forming a complete loop distally . . . . . *O. dermatogenyos*
   Laurer's canal not forming a complete loop distally; seminal vesicle extending well back of acetabulum . . . . . *O. dendrochiri*

Manter and Pritchard (1961) claim to have found *Opegaster ditrematis* Yamaguti, 1942 in *Moringua javanica*, *Myrichthys maculosus*, and *Malacanthus hoedtii*, but these fishes have not been available to us.

Reprinted from THE JOURNAL OF PARASITOLOGY, April, 1946, Vol. 32, No. 2, pages 156–163.

THE TREMATODE GENUS *OPECOELOIDES* AND RELATED GENERA, WITH A DESCRIPTION OF *OPECOELOIDES POLYNEMI* N. SP.*

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This paper is based on thirteen specimens of trematodes, representing two genera, collected in 1941 by Dr. Donald V. Moore from *Polynemus octonemus* Girard, a threadfin fish, in the vicinity of Galveston, Texas. Three of the specimens are identified as *Pseudopecoeloides carangi* (Yamaguti, 1934); the other ten specimens are considered a new species of *Opecoeloides* Odhner, 1928.

The writer wishes to express her appreciation to Dr. H. W. Manter, University of Nebraska, for making available these and other specimens and for many helpful suggestions, and also to Miss Marjorie Jean Raecke, U. S. Bureau of Animal Industry, Washington, D. C., for information regarding the type specimen of *Cymbephallus fimbriatus* Linton, 1934.

THE GENUS *Opecoeloides*

The genus *Opecoeloides* (superfamily: ALLOCREADIOIDEA; family: OPECOELIDAE) was named by Odhner in 1928 for *Distomum furcatum* Bremser, 1819 (in Rudolphi, 1819). This trematode had been rather completely described by Lühe (1900), although he did not include figures of it. The only known reliable figure of *D. furcatum* is by Stossich, 1883, reprinted in Bronn's Thierreichs, Vol. 4, (1893).

The chief generic characters of *Opecoeloides* are: absence of a cirrus sac; presence of an accessory sucker; ceca which open into the excretory vesicle; and a pedunculated acetabulum with papillae. One additional species has been named: *Opecoeloides manteri* (Hunninen and Cable, 1940) Hunninen and Cable, 1941.

A study of trematodes similar to *Opecoeloides* reveals that the exact nature of the ends of the intestinal ceca is often undetermined and that the error of mistaking the accessory sucker for a "genital sucker" has persisted, although corrected by Lühe and by Odhner for *Opecoeloides furcatus*. (Odhner retained the neuter spelling "furcatum." The spelling of the word "Opecoeloides" could indicate either neuter or masculine, but since *Opecoeloides* means "like Opecoelus" and *Opecoelus* is masculine, *Opecoeloides* is here interpreted as being masculine.) A revision of some of these species will be considered later.

Opecoeloides polynemi n. sp.
(Figs. 1–4)

The body is smooth, flattened, and rounded at both ends. It measures 1.706 to 2.289 mm long by 0.182 to 0.381 mm wide. The oral sucker varies from 0.124 to 0.180 mm in transverse diameter. A short prepharynx is present; the pharynx is 0.083 to 0.133 mm long and 0.072 to 0.096 mm wide; when contracted it may be as wide as long. The esophagus measures 0.064 to 0.136 mm, bifurcating immediately anterior to the acetabulum. The ceca open into the excretory vesicle near the excretory pore (Fig. 2).

The acetabulum is stalked. In all ten specimens it is extended so that no measurement of transverse diameter could be taken. The longitudinal diameter of the extended acetabulum ex-

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Dollfus (1948) shows that two species of trematodes have been con
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clusive of stalk measures 0.158 to 0.194 mm; its depth 0.158 to 0.237 mm. The outer rim of the acetabulum is divided into an anterior lip, a posterior lip, and two bilobed lateral lips. Each of the lips possesses a definite number of prominent finger-like papillae. The anterior and posterior lips have two papillae each. The lateral lips bear three papillae, a pair and a single, either of which may be anteriorly placed on the lip. When the pair is anterior on the left lip, the single is anterior on the right lip. The converse also occurs, but the single papilla is always laterally opposite a pair on the other lateral lip. Short, longitudinal muscles occur in each lateral lip near the juncture of the two lobes (Fig. 3).

The accessory sucker is located on a level with and to the left of the esophagus. It is surrounded by a distinct limiting membrane. Its transverse diameter is 0.038 to 0.064 mm.

The genital pore is immediately anterior and slightly to the right of the accessory sucker. The testes are located in the posterior half of the body, are tandem but not touching, and are rounded or slightly lobed. The sinuous seminal vesicle is long, extending to two-thirds the distance between the genital pore and the ovary. The cirrus is short, 24 by 17 μ, and muscular. The pars prostatica, 76 to 96 μ long, is conspicuous and gently curving to the right of the accessory sucker (Fig. 4). The post-testicular space is from 19 to 29% of the total body length, usually 22 or 23%.

The ovary is rounded and pretesticular, lying near the middle of the body. The transverse uterine folds are entirely preovarian. The terminal portion of the uterus lies to the right of the pars prostatica and opens into a common genital pore. Follicular vitellaria fill the lateral fields from near the base of the acetabular stalk to the end of the body. Posterior to the testes they also fill the intercecal region. Four vitelline ducts, two of which serve the posterior part of the body, converge immediately anterior to the ovary. Most of the eggs collapsed in mounting so that measurements may be slightly misleading. What seem to be typical sizes, in utero, are 48 to 54 μ by 24 to 29 μ.

The excretory vesicle is I-shaped, extending anteriorly to the ovary. The excretory pore is subterminal and dorsal.

Measurements in millimeters of the type specimen: *Size:* 2.138 by 0.288. *Oral sucker:* 0.158 by 0.144. *Acetabulum:* Depth 0.216, longitudinal diameter including stalk 0.237, without stalk 0.180. *Sucker ratio of longitudinal measurements:* 1:1.25. *Accessory sucker:* Transverse diameter 0.053. *Pharynx:* 0.096 by 0.096. *Esophagus:* 0.100. *Seminal vesicle:* Extends 71% of the distance between genital pore and ovary. *Post-testicular space:* 23% of body length.

Host: Polynemus octonemus Girard, threadfin fish.
Locality: Gulf of Mexico, Galveston, Texas.
Location: Intestine.
Number: Ten from one fish.
Type specimen: U. S. National Museum, Helm. Coll. No. 45887.

A comparison of *O. polynemi* with related trematodes will follow a consideration of the generic status of several species.

Cymbephallus LINTON, 1934, A SYNONYM OF *Opecoeloides* ODHNER, 1928

A study of the genus *Cymbephallus* Linton, 1934 was undertaken because a number of Linton's figures (Linton, 1900, Figs. 38–39; 1901, Figs. 335–336; 1940, Figs. 18–19) suggested the possibility that he had overlooked the similarity between his specimens and *Distomum furcatum*.

The generic name *Cymbephallus* first appeared in Manter, 1934, credited to Linton whose paper appeared later in 1934. The diagnosis given by Manter (1934: 295) was based on earlier descriptions of *D. vitellosum* Linton, 1900, on certain specimens in his own collections, and on the manuscript of Linton's paper then in press.

The type species of *Cymbephallus* is *Distomum vitellosum* Linton, 1900, from the silver hake, *Merluccius bilinearis* (Mitchill) at Woods Hole, Mass. The original description and figures of this species, as well as Linton's generic diagnosis of *Cymbephallus*, did not indicate any accessory sucker except a "genital sucker" and contained no mention of a uroproct. Thus, Manter's concept of the genus was one with which his *Cymbephallus vulgaris*, with a muscular genital atrium, agreed. In-

dication of discrepancy between the two concepts of the genus became evident in 1940 when Linton redescribed and figured his *Cymbephallus vitellosus* and *Cymbephallus fimbriatus*. Here Linton's figures indicate the presence of a distinct male sucker described as: "Genital pores in front of ventral sucker, to left of midline, male aperture surrounded by a strong, muscular, sucker-like structure" (Linton, 1940: 75–76). Another point of uncertainty appeared in the presence or absence of acetabular papillae which were entirely absent in *C. vulgaris* Manter, 1934 but present in some descriptions of *D. vitellosum*. Linton considered them to be too variable to be of taxonomic value.

During the period from 1898 to 1934 Linton collected numerous trematodes which he identified as *D. vitellosum* from more than fifty different hosts. The descriptions are variable and incomplete. The original description of *D. vitellosum* has no mention of papillae on the acetabulum, but a few months later in referring to two small specimens from a flounder, *Paralichthys dentatus* (Linn.), Linton described the posterior edge of the acetabulum as deeply notched so as to form two or three blunt digitate lobes (Linton, 1901: 482, Fig. 336). In 1905, he described a muscular sucker at the male genital opening on one specimen and commented that other specimens had papillae. Later, Linton (1934) stated that the acetabulum is "often more or less pedicellate" and has "4 or 5 lobes on the posterior border and about 4 on the anterior border." The 1940 description of *C. vitellosus* is almost as unsatisfactory as earlier accounts, stating that the acetabulum is more or less prominent or even pedicellate, and has four or five lobes on the posterior border and about four on the anterior border; but two of the three figures (Figs. 18–19) show three anterior and two posterior papillae.

The variability of Linton's descriptions and figures and the uncertain nature of the genus *Cymbephallus* made it evident that a study of the type specimen of *Distomum vitellosum* Linton, 1900 should be undertaken. The specimen (U. S. National Museum Helm. Coll., No. 7060, old number 6351) was loaned by the National Museum through the kindness of Dr. E. W. Price. Since the published data on *Cymbephallus* are conflicting and evidently inadequate, the status of the genus must depend on this type specimen.

The study of this specimen shows that Linton overlooked several important characters. A preacetabular accessory sucker without a limiting membrane is definitely present but it has no connection with the genital ducts (Fig. 5). The acetabulum is retracted within the body wall; hence when extended would be more or less pedicellate. There are three papillae on the anterior lip of the acetabulum and two on the posterior lip (Fig. 6). No anus could be seen, and the ends of the ceca are obscured by vitellaria. The presence of an accessory sucker and of acetabular papillae are characteristic of the genus *Opecoeloides* Odhner, 1928. Furthermore, although the connection of the ceca with the excretory vesicle could not be seen, all other characters and measurements of the specimen agree with those of *Opecoeloides manteri* (Hunninen and Cable, 1940) Hunninen and Cable, 1941. Figures 335 and 336 of Linton, 1901 correspond with figures 6, 8, and 9 of Hunninen and Cable, 1941. The specimen represented in Linton's figure 336 is from *Paralichthys dentatus* (Linn.), one of the hosts recorded by Hunninen and Cable. Figures 18 and 19 of Linton, 1940 clearly show the three anterior and two posterior papillae, which are distinctive for *O. manteri*. Further comparisons were made with a specimen of

O. manteri collected and identified by Cable. Hunninen and Cable made frontal sections to verify the extent of the ceca, which open into the excretory vesicle. It was concluded that the two specimens are of the same species and that, therefore, *Cymbephallus vitellosus* became *Opecoeloides vitellosus* (Linton, 1900) Von Wicklen, 1946 and *Opecoeloides manteri* (Hunninen and Cable, 1940) became a synonym of *O. vitellosus*. This synonymy was reported in abstract by the author (Von Wicklen, 1946). It should be noted that this conclusion regarding *O. vitellosus* refers only to Linton's original material and not necessarily to all of the various collections of trematodes identified by Linton as *Distomum vitellosum* because they almost certainly include a variety of species.

Dr. H. W. Manter kindly lent the author his mounted specimens of *Anisoporus eucinostomi* Manter, 1940. What was originally described as an anus was doubtless a fold in the skin, since sections through the posterior end of a specimen reveal that the ceca open into the excretory vesicle (Fig. 7). This additional information adds another species to the genus *Opecoeloides*, *Opecoeloides eucinostomi* (Manter, 1940) n. comb. with the synonym *Anisoporus eucinostomi* Manter, 1940.

COMPARISONS

Opecoeloides polynemi is to be compared with three other species in the genus: *O. furcatus*, *O. vitellosus* (= *O. manteri*), and *O. eucinostomi* (= *Anisoporus eucinostomi*). It can be distinguished from these by the total number of papillae, ten, and by the unique arrangement of the lateral papillae. The accessory sucker of *O. polynemi* is much smaller than that of *O. furcatus* and of *O. eucinostomi*, and differs from that of *O. vitellosus* in having a distinct bordering membrane.

Pseudopecoelus N. GEN.

Cymbephallus vulgaris Manter, 1934 is evidently generically distinct from *Opecoeloides vitellosus*. It has no accessory sucker, no acetabular papillae, and ceca which end blindly. Several other species of *Cymbephallus* similar to *C. vulgaris* have been named. With the fall of *Cymbephallus* into synonymy with *Opecoeloides*, a new generic name is required for these species. The name *Pseudopecoelus* is proposed since this genus resembles *Opecoelus* in that the acetabulum is usually protrusible and the accessory sucker is lacking. It is different in that the ceca end blindly and there are no acetabular papillae.

Generic diagnosis of Pseudopecoelus (OPECOELIDAE): Body smooth, elongated; acetabulum usually protrusible, never papillated; anus lacking, ceca end blindly; muscular genital pore located well anterior to the acetabulum and to the left of the pharynx; testes tandem; cirrus sac greatly reduced or lacking; cirrus short and muscular; prostate gland lacking; seminal vesicle tubular and not enclosed in the cirrus sac; vitellaria from region of acetabulum to the posterior end; ovary pretesticular; uterus preovarian; seminal receptacle lacking; eggs medium-sized to large. Parasites of marine fishes.

Type species: *Pseudopecoelus vulgaris* (Manter, 1934) n. comb.
Synonym: Cymbephallus vulgaris Manter, 1934.

Other species: *Pseudopecoelus japonicus* (Yamaguti, 1938) n. comb.
Synonym: Cymbephallus japonicus Yamaguti, 1938.
Pseudopecoelus elongatus (Yamaguti, 1938) n. comb.
Synonym: Cymbephallus elongatus Yamaguti, 1938.

It is possible that a fourth species is represented by specimens recorded by Hopkins (1941) as *C. fimbriatus* from the white perch, *Bairdiella chrysura*

(Lacépède) at Beaufort, North Carolina. He evidently based his identification on Manter's (1934) interpretation of *Cymbephallus* because, judging from his figures, his specimens have no acetabular papillae, no accessory sucker, and ceca which end blindly. In accordance with the classification above, these specimens would be in the genus *Pseudopecoelus*.

Cymbephallus fimbriatus Linton, 1934 (in Manter, 1934) and later described in Linton (1934) is based on specimens collected by Linton from *Menticirrhus saxatilis* (Bloch and Schneider), kingfish, at Woods Hole, Mass., and identified earlier (Linton, 1901) as *Distomum vitellosum*. It is also recorded (Linton, 1934: 82) from *Bairdiella chrysura, Menticirrhus americanus* and *Sciaenops ocellatus* at Beaufort, N. C., from which hosts he had previously reported it as *D. vitellosum*. He distinguished *C. fimbriatus* from *C. vitellosus* on the basis of larger size, more numerous acetabular papillae, lobed testes, extent of seminal vesicle, extent of vitellaria, and egg size.

As in the case of *C. vitellosus*, the status of *C. fimbriatus* must depend not so much on Linton's early and inadequate descriptions, and obviously not on the specimens identified by Manter (1934: 295), but upon the type specimens from *Menticirrhus saxatilis* at Woods Hole (U. S. National Museum No. 8266). There are nine specimens on two slides. These specimens were studied for the writer by Miss Marjorie Jean Raecke. It seems certain that *C. fimbriatus* cannot be assigned to either *Pseudopecoelus* or to *Opecoeloides* but must represent a new genus.

The *Cymbephallus fimbriatus* Linton, 1934 of Manter, 1934 evidently belongs to the genus *Pseudopecoelus* as described above. Since the characteristics of this latter species do not agree with the type specimens of *C. fimbriatus*, its identification as such was an error, and the species is without a name. The name *Pseudopecoelus tortugae* n. sp. (named for the locality, Tortugas, Fla.) is proposed for it, with the synonym *Cymbephallus fimbriatus* Linton, 1934 of Manter, 1934.

Fimbriatus N. GEN. RELATED TO *Opecoeloides*

A study of specimens of a trematode from *Menticirrhus americanus* (Linn.) collected by Dr. H. W. Manter at Beaufort, N. C., led to the suspicion that the specimens from that host identified by Linton as *C. fimbriatus* could not belong in the genus *Opecoeloides* nor in *Pseudopecoelus*. A report on the type specimens of *C. fimbriatus* by Miss Raecke confirmed this suspicion. An accessory sucker is clearly present with the genital pore lying anterior to it. There are two ani, each cecum opening separately to the outside. The acetabulum is protrusible and has five lobe-like processes, each with a fimbriated border. For this species is proposed the new genus *Fimbriatus*. The genus has the family characteristics of OPECOELIDAE plus the generic distinction of two ani, an accessory sucker, and a pedunculated acetabulum with fimbriated lobes. The type species is *Fimbriatus fimbriatus* (Linton, 1934) n. comb., with the synonym *Cymbephallus fimbriatus* Linton, 1934.

Pseudopecoeloides carangi (YAMAGUTI, 1938) YAMAGUTI, 1940

Among the trematodes from *Polynemus octonemus* were three specimens which resembled *Opecoeloides* except that they had neither an accessory sucker nor papillae on the acetabulum. Yamaguti (1940) created the genus *Pseudopecoeloides* for species with such characters. There are two species in the genus: *P. tenuis*

Yamaguti, 1940 and *P. carangi* (Yamaguti, 1938). *P. carangi* was first described from the Japanese fish *Caranx mertensi* Cuv. et Valenc. and later from *Selar crumenophthalmus* (Bloch) in the region of La Plata Island, Ecuador (Manter, 1940). This report extends the range and host list for *P. carangi*.

The specimens are 2.304 to 2.600 mm long by 0.27 to 0.30 mm wide. The acetabulum, withdrawn in one specimen, measures 0.184 mm in transverse diameter; the oral sucker-acetabulum ratio is 1:1.4. The egg measurements given by Yamaguti are 62 to 72 μ by 33 to 35 μ. Those recorded by Manter are slightly smaller. Measurements in the present study, 67 to 70 μ by 38 to 40 μ are slightly wider than Yamaguti's but fall within his measurements for length. Although not recorded as a generic character, it might be noted that the vitellaria are discontinuous opposite the ovary and the testes in both species.

COMPARISON OF *Opecoeloides* AND RELATED GENERA

Genus	*Accessory sucker*	*Acetabulum*	*Acetabular papillae*	*Uroproct*	*Anus*
Opecoeloides	Present	Protrusible	Present	Present	Absent
Pseudopecoeloides	Absent	Protrusible	Absent	Present	Absent
Opecoelus	Absent	Usually protrusible	Present	Absent	One
Pseudopecoelus	Absent	Usually protrusible	Absent	Absent	Absent, ceca end blindly
Anisoporus	Present	Protrusible	Present	Absent	One
Fimbriatus	Present	Protrusible	Present	Absent	Two

SUMMARY

1. A new species of digenetic trematode, *Opecoeloides polynemi*, from *Polynemus octonemus* Girard, a threadfin fish, from the Gulf of Mexico is described.

2. *Distomum vitellosum* Linton, 1900 is redescribed from the type specimen and is found to have a protrusible acetabulum with papillae, and an accessory sucker. Its name now is *Opecoeloides vitellosus* (Linton, 1900). The genus *Cymbephallus* Linton, 1934 is a synonym of *Opecoeloides*.

3. *Opecoeloides manteri* (Hunninen and Cable, 1940) is considered a synonym of *O. vitellosus* (Linton, 1900).

4. *Pseudopecoelus* n. gen. is named for *Cymbephallus vulgaris* Manter, 1934 which becomes *Pseudopecoelus vulgaris* (Manter, 1934) n. comb.

5. *Fimbriatus* n. gen. is named for *Cymbephallus fimbriatus* Linton, 1934 which becomes *Fimbriatus fimbriatus* (Linton, 1934) n. comb. The genus is characterized by fimbriated lobes on the acetabulum, an accessory sucker, and two ani.

6. The *Cymbephallus fimbriatus* Linton, 1934 of Manter, 1934 is given the name *Pseudopecoelus tortugae* n. sp.

7. The following additional changes in nomenclature are proposed: *Opecoeloides eucinostomi* (Manter, 1940) n. comb., synonym: *Anisoporus eucinostomi* Manter, 1940; *Pseudopecoelus japonicus* (Yamaguti, 1938) n. comb., synonym: *Cymbephallus japonicus* Yamaguti, 1938; *Pseudopecoelus elongatus* (Yamaguti, 1938) n. comb., synonym: *Cymbephallus elongatus* Yamaguti, 1938.

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PORACANTHIUM and OPECOELOIDES

Dollfus (1948) shows that two species of trematodes have been confused and both referred to as Opecoeloides furcatum (Bremser, 1819) Odhner,1928, first named as Distomum furcatum by Bremser in Rudolphi,1819. One of these possessing spines in the genital atrium belongs in a distinct genus named Poracanthium by Dollfus 1948. This is the species described and diagramed by Stossich (1883) as Dist.furcatum Brems. In other words, the species Dollfus redescribes and places in the genus Poracanthium is the Dist.furcatum Bremser of Stossich,1883.

The other species is the Dist.furcatum Bremser of Lühe (1900) and Odhner (1928). It is the one which has been generally accepted as the species named by Bremser and known as Opecoeloides furcatum . Dollfus used the trivial name furcatum for both species and attributed authorship to Stossich,1883 and Lühe,1900, respectively in the two genera. Thus, the name ######## of Bremser, who first used the name furcatum, does not appear at all. Presumable this ommission will be corrected if Bremser's type specimen is found.

Dollfus states: "Est-ce l'espece decrite par Stossich, ou celle decrite par Luhe et Odhner, qui est le vrai Dist.furcatum Bremser ? Si les specimens-types de la collection Bremser existent encore au Musee de Vienne, il sera peut etre possible de le savoir, en attendat, je designerai l'espece a ventouse accessoire decrite par Luhe et Odhner sous le nom d' Opecoeloides furcatus (M.Luhe,1900) T.Odhner,1928 et elle a orifice genital arme d'epines sous le nom de Poracanthium furcatum (M.Stossich,1883) R.PH Dollfus 1948."

It is possible that Dollfus was using author's name in a bibliograpic sense but his use of parentheses indicates not.

PORACANTHIUM Dollfus,1948

Opecoelidae. With papillae on acetabulum. Anus absent; Ceca end blindly (?). Accessory sucker lacking. Genital atrium with numerous spines. Gonads more or less tandem. Cirrus sac lacking; seminal vesicle not observed; seminal receptacle small.

Type species P. furcatum (the Dist. furcatum Bremser,1819 of Stossich,1883)

Genus Opecoeloides

The genus *Opecoeloides* was named by Odhner (1928) for *Distomum furcatum* Bremser in Rudolphi, 1819. Odhner compared it with *Opecoelus* Ozaki, 1925 from which it differs (1) in possessing an accessory sucker between the acetabulum and genital pore; (2) in lack of cirrus sac; and (3) in that the ceca enter the excretory vesicle rather than opening to the outside. Acetabular papillae or processes occur as in *Opecoelus*. The presence of an accessory sucker occurs also in the genus *Anisoporus* Ozaki, 1928 and in the genus *Genitocotyle* Park, 1937. *Genitocotyle* lacks acetabular papillae and the ceca end blindly. *Pseudopecoeloides* Yamaguti, 1940 has a protuberant acetabulum and a uroproct but lacks both the accessory sucker and acetabular papillae. *Anisoporus* differs from *Opecoeloides* only in that the ceca open through a single anus rather than into the excretory vesicle. Manter (1940) has questioned the validity of basing a genus on this single character which is sometimes difficult to determine.

Much of the confusion in this group of trematodes has arisen from a misinterpretation of the accessory sucker which has several times been reported as

a genital sucker surrounding a male genital pore. The true nature of the sucker was described as early as 1900 by Lühe. Von Wicklen (1946), after a study of the type specimen of *Distomum vitellosum* Linton, 1900, revised the group. She recognized the following genera: *Opecoeloides* Odhner, 1928, with *O. furcatus* (Bremser, 1819) as type species; *Pseudopecoeloides* Yamaguti, 1940, with *P. tenuis* Yamaguti, 1940 as type species; *Opecoelus* Ozaki, 1925, with *O. sphaericus* Ozaki, 1925 as type species; *Pseudopecoelus* Von Wicklen, 1946 with *P. vulgaris* (Manter, 1934) as type species; *Anisoporus* Ozaki, 1928 with *A. cobraeformis* Ozaki, 1928 as type species; and *Fimbriatus* Von Wicklen, 1946, with *F. fimbriatus* (Linton, 1934) as type species.

Opegaster Ozaki, 1928 is very closely related to *Opecoelus* except that the seminal vesicle does not extend posterior to the acetabulum, and the vitellaria reach anterior to the acetabulum. *Genitocotyle* Park, 1937 is apparently like *Pseudopecoelus* except that an accessory sucker is present.

The number and form of acetabular papillae are probably good specific characters in this group. Linton assumed them to be highly variable and did not attempt to differentiate species upon them. Odhner (1928) showed they may be extended or retracted in *Opecoeloides furcatus* but always discernible at least in sections. Several species which I have studied suggest that these papillae can be recognized without great difficulty even when contracted and that their number within a species is either constant or varying only by one or two.

The following species of *Opecoeloides* are known: *O. furcatus* (Bremser, 1819); *O. vitellosus* (Linton, 1900) Von Wicklen, 1946; *O. eucinostomi* (Manter, 1940) Von Wicklen, 1946; *O. polynemi* Von Wicklen, 1946. *Anisoporus thyrinopsi* Manter, 1940 may belong in the genus *Opecoeloides* since only one specimen was studied and the anus evidently was not conspicuous.

Opecoeloides Odhner, 1928

This genus is based on Distomum furcatum Brems. which agrees almost completely with Opecoelus. There are 6 tentacles on the acetabulum. The acetabulum is protrudant on a stalk.

According to Odhner, Opecoeloides differs from Opecoelus in (1) it possesses a peculiar accessory sucker between the acetabulum and the genital pore; (2) a true cirrus sac is lacking although a muscular pars prostatica is present. Odhner also shows that in Opecoeloides the ceca open into the excretory vesicle rather than to the outside. Ark. Zool., 20 (B,2): 1-6

Anisoporus seems closely related

Genitocotyle is evidently related

-OVER-

Genus: *Opecoeloides* Odhner, 1928
Syn.: *Cymbephallus* Linton, 1934

The genus *Opecoeloides* was proposed by Odhner in 1928 for *Distomum furcatum* Bremser, 1819 (in Rudolphi, 1819). He differentiated this genus from *Opecoelus* Ozaki, 1925, in the presence of an accessory sucker between the acetabulum and the genital pore, in the absence of a cirrus sac and the caeca entering the excretory vesicle instead of opening to the exterior. In the genera *Anisoporus* Ozaki, 1928, and *Genitocotyle* Park, 1937, the accessory sucker is also met with but in the former genus the intestinal caeca open through a single anus and not into the excretory vesicle; in the latter genus the acetabular papillae are absent. *Pseudopecoeloides* Yamaguti, 1940, has a pedunculated acetabulum and a uroproct but lacks both the accessory sucker and the acetabular papillae.

Von Wicklen (1946) described a new form, *Opecoeloides polymorphus*, from the intestine of *Polynemus octonemus* Girard, a threadfin fish, obtained from the Gulf of Mexico, Galveston, Texas. In the same paper he synonymised the genus *Cymbephallus* Linton, 1934, with the genus *Opecoeloides* Odhner, 1928. The type species of the genus *Cymbephallus*, i.e. *C. vitellosus* (Linton, 1900) Linton, 1934, was also transferred to the genus *Opecoeloides*. As this specimen was restudied by him, he made clear that it has a pre-acetabular accessory sucker without a limiting membrane, the acetabulum when extended would be pedicellate, with three papillae on its anterior lip and two on the posterior lip. The anus is absent. He also considered *O. manteri* (Hunninen and Cable, 1940) Hunninen and Cable, 1941, as a synonym of *O. vitellosus* (Linton, 1900) Von Wicklen, 1946, on the basis of common characters found in them, and *Anisoporus eucinostomi* Manter, 1940, should be *O. eucinostomi* (Manter, 1940) Von Wicklen, 1946.

Read (1947) gave the diagnosis of a new species, *Opecoeloides polyfimbriatus*, from the intestine of *Synodus foetens* obtained from the Gulf of Mexico. He pointed out that the accessory sucker in the new species lies on the right side of the body whereas in other members of the genus it is on the left. Manter (1947) in America added two new species, *O. brachyteleus* and *O. elongatus*, to the genus, the former species from the intestine of *Mulloidichthys martinicus* (Cuv. and Val.), a yellow goat fish, and the latter from the intestine of *Pseudupeneus maculatus* (Bloch), a red goat fish. He also suggested the transference of *Anisoporus thrinopsi*, which was described by him earlier in 1940 from the intestine of *Thrinops pachylepsis* (Gunther), to the genus *Opecoeloides*.

FROM N. K. GUPTA, 1956

OPECOELOIDES Odhner, 1928

Distomum furcatum Brems. is without doubt closely related to Opecoelus. The structure agrees almost completely with Ozakii's description. If one looks at the elongated dead specimen of Dist.furcatum (see fig.11 of Stossich, 1883) even the 6 tenticle or fingerelike protuberance occur. Odhner's specimens killed alive have unstalked acetabulum and show no tentacles, but these can be seen weakly in cross-section. The species differs only on two points: Opecoelus lacks the peculiar accessory sucker. In Dist.furcatum the ceca open into the excretory vesicle rather than to the outside. Although a very minute cirrus sac is described by Luhe, Odhner believes it lacking.

Type species : Opecoeloides furcatum (Bremser)

Chief generic characters according to vonWicklen (1946):

Absence of a cirrus sac; presence of an accessory sucker; ceca which open into the excertory vesicle; and a pedunculated acetabulum with papillae. Species:

Type species: Opecoeloides furcatus (Bremser, 1819)

Other species: Opecoeloides vitellosus (Linton, 1900) VonWicklen, 1946

Syn. O.manteri

Opecoeloides polynemi VonWicklen, 1946

Opecoeloides eucinostomi (Manter, 1940)

Opecoeloides polyfimbriatus Read, 1947

OPECOELOIDES Odhner,1928 Opecoelidae

from Pritchard,1966

Some notes on the genus *Opecoeloides* ODHNER, 1928.

The genus *Opecoeloides* is like *Opecoelus* and *Paropecoelus* except that a preacetabular accessory sucker is present and the ceca usually join the excretory vesicle to form a uroproct, although SOGANDARES-BERNAL and HUTTON (1959) have shown that in *Opecoeloides fimbriatus* (LINTON, 1934) SOGANDARES-BERNAL and HUTTON, 1959, the extended worms often have ani while more contracted specimens have a uroproct. YAMAGUTI (1954, 1958) records that the type species, *O. furcatum* (BREMSER in RUDOLPHI, 1819) ODHNER, 1928, has been reported from the Adriatic (type locality), the Mediterranean, and from Naha, Okinawa. The latter record is only provisional, however, because YAMAGUTI (1942) who reported it stated that he had not observed the accessory sucker with certainty. Thus, the genus is at present represented by six species in the Caribbean and Gulf of Mexico, the type species from the Adriatic and the Mediterranean, two species from the American Pacific (Panama and Colombia), and one species from India.

Four paratypes of *Opecoeloides polynemi* VON WICKLEN, 1946, in the H. W. Manter Collection have 4 pairs of acetabular papillae in the antero-lateral and postero-lateral positions (as in some *Paropecoelus* species) and one pair of apertural papillae (Fig. 10b). This arrangement of papillae is not precisely as reported by VON WICKLEN (1946, Fig. 3); rather, it results from a reinterpretation of the paired papillae and a new determination of the longitudinal axis.

SOGANDARES-BERNAL and HUTTON (1959) and KRUSE (1959) have published corrected figures of the acetabular papillae of *Opecoeloides fimbriatus*. In this species the peripheral papillae are represented by expanded lobes the lateral borders of which are edged by papillae. The median papilla of each lobe is larger and more elongate than the others. The apertural pair of papillae is also well developed.

Opecoeloides polyfimbriatus READ, 1947, is probably very closely related, if not identical, to *O. fimbriatus*. The holotype of *O. polyfimbriatus*, kindly loaned by Dr. W. W. Becklund, Beltsville Parasitological Laboratory, has the acetabulum retracted into the acetabular stalk (Fig.10c), but a single pair of apertural papillae is evident. Furthermore, there is evidence of two papillated lobes on the posterior half of the acetabulum which is consistent with READ's (1947) figure of the acetabulum of a paratype showing at least six papillae posteriorly. It is probable that *O. polyfimbriatus* has four papillae-bearing lobes as in *O. fimbriatus*. Though Read stressed the dextral location of the accessory sucker, it is in fact sinistral as in other species of the genus, and Read's figure of the totomount appears to be a dorsal view of the holotype. Final determination of the validity of *O. polyfimbriatus* must await the collection of more favorable specimens.

Opecoeloides manaarensis N. K. GUPTA, 1956, almost certainly has four pairs of peripheral papillae and probably one pair of apertural papillae. This interpretation would agree with Gupta's (1956) detailed figure of the acetabulum. Vitellaria obscure the ends of the ceca, so the inclusion of this species in the genus *Opecoeloides* is based on the presence of a very small and indistinct accessory sucker. *Opecoeloides manaarensis* was reported from a goatfish in India.

Opecoeloides resembles *Opecoelus* in having two evolutionary lines, one involving species with apertural papillae only and the other with both apertural and peripheral papillae. Species of the latter group always have a single pair of apertural papillae (in contrast with two such pairs in *Paropecoelus*). The relationships and distributional

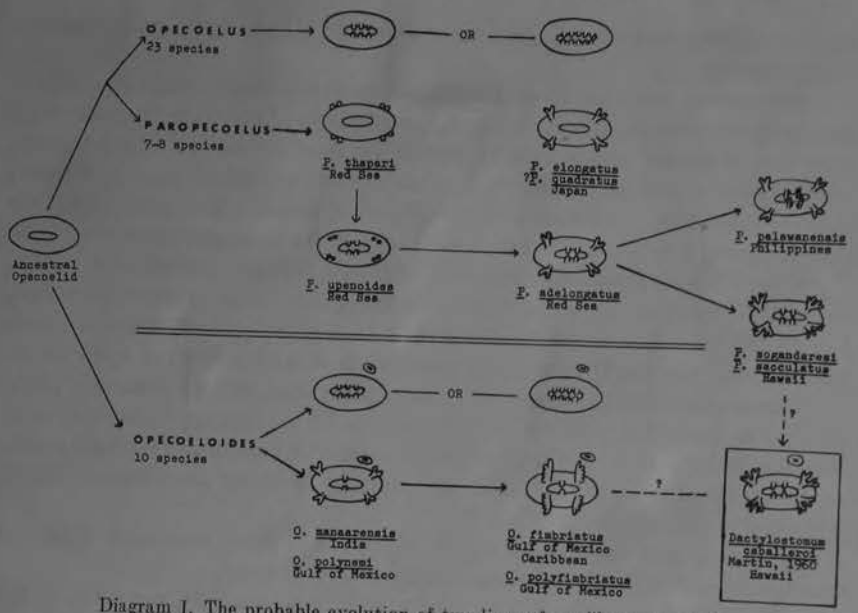


Diagram I. The probable evolution of two lines of papillate opecoelids.

pathways of *Opecoeloides* species with peripheral papillae are considerably more obscure than for *Paropecoelus* (Diagram 1). The large number of species in the Caribbean suggests that region as a point of origin for the genus, perhaps before the rise of the Central American land barrier because of the two species from the American Pacific and the species from India.

Genus CYMBEPHALLUS Linton (in press) of Manter = Pseudopecoel

Two species of trematodes in the present collection seem to show many resemblances to the *Dist. vitellosum* of Linton. Linton has now in press a revision of the trematodes of the Woods Hole region in which *Dist. vitellosum* is referred to a new genus *Cymbephallus*. Dr. Linton has very kindly forwarded to me an advance copy of his description of the genus *Cymbephallus* and of its two species to which he allots his former *Dist. vitellosum*. It is believed that the two following species can be referred to this genus, although both seem to lack the scalloped or papillated border of the ventral sucker. The following diagnosis is based chiefly on my two species, but includes the characters noted by Linton.

Cymbephallus: Allocreadiinæ. Unspined, usually elongate. Ventral sucker more or less embedded in the body or protruded, surmounted or encircled by folds of the body wall, with or without lobes or papillæ. Anus lacking.[1] Genital pore to the left, well anterior to ventral sucker. Testes smooth or lobed, tandem, postovarian, median. Cirrus short and thick, sucker-like. Cirrus sac reduced, enclosing only the short cirrus and the pars prostatica. Prostate gland lacking. Seminal vesicle tubular, entirely outside cirrus sac, extending posterior to ventral sucker. Uterus rather short, eggs medium-sized to large. Uterine seminal receptacle. Vitelline follicles from region of ventral sucker to posterior end.

[1] Linton does not mention the presence or absence of ani which are presumably lacking.

The outstanding characteristic of the genus is the structure of the terminal genital ducts. These are strongly suggestive of the Opecœlidæ of Ozaki (1928), in particular *Opecœlus elongatus* Ozaki, 1928. An anus, however, does not occur in *Cymbephallus*.

Diagnosis of Linton (1934): = Opecoeloides

Body smooth, moderately elongate; ventral sucker surrounded by a raised border of the body wall, which may be more or less scalloped, papillate, or slightly fimbriate cirrus very short, appearing as a muscular sucker at the orifice of the ejaculatory duct in front of the ventral sucker, to the left of the median line. Testes smooth or lobed, median, one following the other, behind the smooth or lobed ovary. Vitellaria diffuse.

Type species, Cymbephallus vitellosus (Linton)

Opecoeloides furcatum (Bremser in Rud.,1819) Odhner,1928

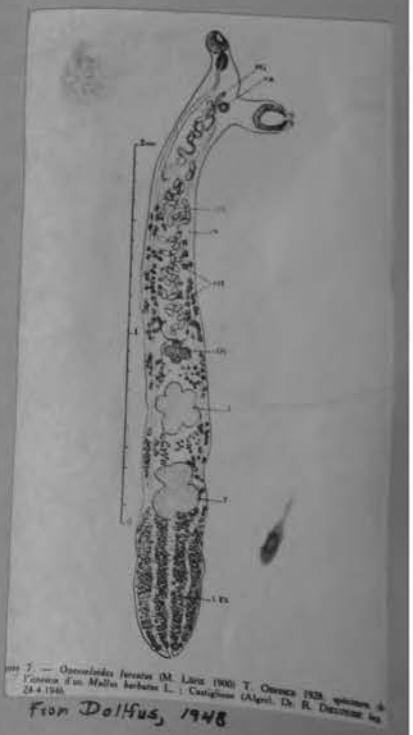
Condensed from Luhe,1900:

Body very elongate, only a little flattened, almost cylindrical. Anterior end appears forked because of the acetabular stalk. Luhe saw that the accessory sucker was not a genital sucker but clearly separate from the genital atrium. Sessile (accessory sucker) a little smaller than oral sucker, 0.135 as compared with 0.165, equally powerful and quite thick walled. Acetabulum larger, up to 0.200. Ovary like the testes, median, and like them strongly lobed. Vitellaria begin somewhat in front of halfway between origin of acetabular stalk and the ovary and reach to the hind end; unbroken opposite testes. Seminal receptacle lacking. Seminal vesicle much coiled, dorsal to uterus. Genital pore lies close to the accessory sucker, not exactly median but slightly to the right. Genital atrium with circular muscles. Eggs 60 by 36 μ.

3 pairs acetabular papillae.

Esopahgus rather long.

Luhe thought a very delicate cirrus sac was present but Odhner questioned this.



From Dollfus, 1948

Family: Opecoelidae.

…g. 6. *Opecoeloides* …*urcatus* (Bremser); ventral view.

1. *Opecoeloides furcatus* (Bremser) Odhner 1920,
   Synonyms: *Distomum furcatum* Bremser,
   Fasciola furcata (Brems.) Blainv. 1828,
   Podocotyle furcatum (Brems.) Stossich 1898.

Adriatic Sea

Found in *Mullus barbatus* (table I).

Discovered by B r e m s e r this form has been described by this author under the name *Distomum furcatum*. R u d o l p h i (1819) mentioned this form in his work. B l a i n v i l l e (1928) changed the name into *Fasciola furcata*. S t o s s i c h (1898) determined this form as *Podocotyle furcatum*. L ü h e (1910) looks upon it as belonging to the genus *Podocotyle* and gives a longer description. Finally O d h n e r (1928) stating in this form the existence of communication between the intestinal caeca and excretory vesicle, creates a new genus *Opecoeloides* closely related to *Opecoelus* Ozaki 1925.

Body strongly elongated, 2—10 mm long and about 0.62 mm wide. Oral sucker in diameter 0.12×0.13—0.18×0.18 mm. Acetabulum pedunculated, 0.13×0.16—0.22×0.28 mm in diameter, provided with six digitiform processus. The accesory sucker is on the body-side above the basis of the acetabulum and below the genital pore fig. 6, as represented in the figure given by S t o s s i c h (1883). Prepharynx short, pharynx 0.086—0.13 mm long. The caeca open at the posterior …d of the body into excretory vesicle. Sections operated permitted …state that there exists really a communication with the excretory vesi… described by O d h n e r (1928). The trilobed ovary lies median above …he testes. Receptaculum seminis is absent. The long, narrow Laurer… …anal runs across the body parallelly to the cross ducts of the vitellin… …land, turns upwards and opens outside near the caecum. The transvers… …terine coils are confined to the intercaecal field in front of the ovary. …ggs measure 0.046—0.065×0.031—0.039 mm. The globular vitellin… …ollicles surrounding the caeca, begin at the posterior end of the vesi…ula seminalis and extend till the end of the body. These follicles occupy the whole posttesticular field, and the space between the gonads. Th… …obated testes are situated posterior to the ovary one behind the other. The lobes vary in number and are out more or less deeply. There are individuals in which the testes are approximately oval. Vesicula semi…nalis runs on the dorsal side forming several convolutions. Probably there is no copulatory apparatus. L ü h e (1900) remarks that vas deferen… ends with a very small cirrus, O d h n e r (1928) who studied also thi… part of the body on sections sees in it rather a strongly muscular par… prostatica and thinks the cirrus absent. Both genital pores lead to a common atrium genitale, surrounded with muscles and situated above th… accessory sucker. This orifice, as represented by S t o s s i c h on a figur… in his paper, is armed with two rows of very small spines. The bulb shaped excretory vesicle reach the ovary. Posteriorly it communicate… with intestinal caeca.

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Lühe M. 1900. Über die Gattung *Podocotyle* (Duj.) Stoss. Zool. Anz. Bd. 23, p. 48…
Odhner T. 1928. Weitere Trematoden mit Anus. Arkiv f. Zool. Bd. 20, No 2, Fig…

From Janiszewska 1953

-OVER-

Opecoeloides furcatus (LÜHE, 1900) ODHNER, 1928. A few specimens (U.B.Z.M. No. 48226) were collected from the intestine of two *Mullus barbatus* L.

Specimens from the intestine of *Mullus barbatus* L. (and M. *surmuletus* L. etc.) include two trematode species seemingly hiding for many years under the scientific name "*Distomum furcatum*" (BREMSER in RUDOLPHI, 1819). DOLLFUS (1948) drew attention to this confusion and gave the solution. The first step in this clearing up appeared when LÜHE (1900) in his material of "*D. furcatum*" discovered the presence of an accessory ventral sucker situated between the genital orifice and the stalked ventral sucker proper. This was confirmed by ODHNER (1928) who further found that the intestinal caeca communicated posteriorly with the excretory vesicle and established the genus *Opecoeloides* for the species. The second step in this clearing up appeared when DOLLFUS, as mentioned above, found that his material of "*D. furcatum*" contained not only the form described by LÜHE and ODHNER, but also another form which lacked an accessory ventral sucker but which exhibited a spine-armed genital papilla. This latter species he identified as the one which STOSSICH (1883) had had at hand when describing "*D. furcatum*" (*Porocanthinum furcatum* (STOSSICH, 1883) DOLLFUS, 1948). Which of the above mentioned characteristics really had been present in the original BREMSER/RUDOLPHI material of "*D. furcatum*" is not known. Accordingly I have followed DOLLFUS (1948) as regards the authors names following the scientific names.

An adequate description has been given by LÜHE (1900) and supplementary descriptions and illustrations have been provided by DOLLFUS (1948, Fig. 7) and JANISZEWSKA (1953, Fig. 6). As the present material is in agreement with theirs no further description is required.

FROM BRINKMANN, 1967

47. Opecoeloides brachyteleus n. sp.

Fig. 34

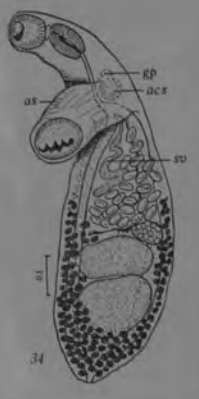
HOST: *Mulloidichthys martinicus* (Cuv. & Val.), yellow goatfish; in 3 of 10 hosts.
LOCATION: Intestine.

Description (based on 5 specimens): Length 0.975 to 2.250 mm, width 0.165 to 0.360 mm, greatest width in posterior half of body. Posterior end abruptly pointed. In the 1.035 mm type specimen: oral sucker 0.093 mm wide, slightly longer than wide; acetabulum 0.136 mm wide, wider than long; sucker ratio 1:1.46. Other specimens did not show ventral view of both suckers. Acetabulum on a distinct body stalk; papillate with 4 anterior and 3 posterior papillae. Forebody 0.225 to 0.487 mm, about 1/4 or a little less of body length. Accessory sucker close in front of acetabular stalk, with distinct border, 51 to 71 μ in diameter. Prepharynx short; pharynx large, longer than wide, 0.102 to 0.153 mm long by 0.071 to 0.133 mm wide; esophagus about same length as pharynx; ceca rather wide; uroproct present. Genital pore closely in front of accessory sucker. Testes very large, close together, wider than long, slightly overlapping ceca, in posterior third or fourth of body; posttesticular space unusually short, 0.102 to 0.255 mm in length or approximately

half the length of the forebody. Genital atrium with a few circular muscles; cirrus a short muscular tube; cirrus sac lacking; seminal vesicle a coiled tube reaching halfway or more to the ovary. Ovary unlobed, immediately pretesticular, slightly to the left; uterus preovarian; metraterm not observed; eggs 43 to 53 by 26 to 29 μ; vitellaria from about the base of the seminal vesicle to posterior end of body; dense and continuous; dorsal, lateral, and ventral to ceca; overlapping testes. Gland cells resembling vitellaria but without yolk granules, extending to acetabulum.

Discussion: This species differs from *O. vitellosus* in number of papillae, longer pharynx, smaller eggs, more conspicuous accessory sucker, and more posterior genital pore. It differs from *O. eucinostomi* in its continuous vitellaria and in the posterior extent of the seminal vesicle. *O. furcatus* has lobed testes and a much larger accessory sucker. If *Anisoporus thyrinopsi* should be found to possess a uroproct rather than an anus it would belong in the genus *Opecoeloides* and be very similar to *O. brachyteleus*, differing in more narrow hindbody, more anterior genital pore, more anterior extent of the vitellaria, 3 rather than 4 anterior papillae on the acetabulum, and longer posttesticular space.

The name *brachyteleus* is from *brachy* = short and *tele* = end, and refers to the short posttesticular region.



Opecoeloides brachyteleus Manter, 1947 (FIGURE 90)

Host: *Mulloidichthys martinicus*.
Site: intestine.
Locality: Puerto Real, P. R.
Deposited specimen: No. 39364.

Our material differs from that described by Manter (1947) chiefly in having 4 posterior papillae on the ventral sucker.

Opecoeloides elongatus Manter, 1947 (FIGURES 87 and 88)

Host: **Mulloidichthys martinicus.*

Site: intestine.

Locality: off Puerto Real, P. R.

Deposited specimen: No. 39362.

Our material differs from Manter's (1947) description in having 4 posterior papillae on the ventral sucker instead of 3 and an accessory sucker with a limiting membrane which, according to Manter, is lacking in his specimens. Our material was dead when taken from the host. The papillae of such trematodes usually retract when living material is fixed, and their exact number is difficult to determine.

from Siddiqi + Cable, 1960

87

Opecoeloides brachyteleus Manter, 1947
Hosts: *Upeneus maculatus* (C, J); *U. martinicus* (C, J). CURAÇAO JAMAICA
Site: intestine.

Opecoeloides elongatus Manter, 1947
Hosts: *Upeneus maculatus* (C, J); *U. martinicus* (C, J). CURAÇAO, JAMAICA

FROM NAHHAS AND CABLE (1964)

88

85. *Opegaster dendrocbiri* ~~n. sp.~~ Yam., 1970
(Fig. 99)

HABITAT: Intestine of *Dendrochirus brachypterus*, Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63709.

DESCRIPTION (based on seven flattened whole mounts): Body flattened subcylindrical, blunt-pointed at each extremity, 1.4-3.6 × 0.33-0.68 mm. Cuticle smooth except for cuticular papillae which are scattered on the forebody. Oral sucker ventroterminal, 0.11-0.18 × 0.13-0.2 mm, followed by prepharynx which may be as long as 30 μ or longer when distinct. Pharynx strongly muscular, 60-100 × 50-110 μ; esophagus muscular, 40-160 μ long, bifurcating at base of acetabular stalk. Ceca united posteriorly and opening ventrally, about 90 μ from posterior end of body in the type. Acetabulum pedunculate, 0.2-0.31 × 0.2-0.35 mm, with four small papillae on anterior and posterior border respectively, situated about middle of anterior third of body; acetabular papillae may be indistinct occasionally.

Testes oval, entire, directly tandem, 0.16-0.5 × 0.23-0.32 mm, largely postequatorial; posterior testis may be at posterior end of middle third of body, mostly at junction of two posterior thirds. Vesicula seminalis subcylindrical, long, large, 70-170 μ wide, extending to posterior end of anterior third of body or a little more posteriorly, tapered and winding anteriorly. Cirrus pouch rudimentary, 50 × 35 μ in the type, enclosing poorly developed pars prostatica and a short cirrus. Genital pore posterosinistral to pharynx in the type.

Ovary reniform, giving off germiduct at its hilus, 0.1-0.18 × 0.17-0.3 mm, situated a little to right of median line at pre-equatorial level. Receptaculum seminis absent, though receptaculum seminis uterinum is conspicuous. Laurer's canal opening a little to left of median line at a pre-ovarian level. Uterus winding from side to side several times in intercecal field between ootype and acetabulum; metraterm running forward alongside attenuated portion of seminal vesicle. Mature eggs 51-60 × 32-38 μ in life; mounted eggs 55-65 × 35-46 μ. Vitellaria confined to lateral fields of hindbody, may intrude into forebody occasionally, may be interrupted opposite ovary and testes on one side or both sides, confluent in posttesticular region. Excretory vesicle I-shaped, reaching to ovary, opening dorsoterminally.

DISCUSSION: This species is characterized by the very long seminal vesicle. For the differences from its related species, see the key to the species of this genus (p. 69).

OPECOELOIDES

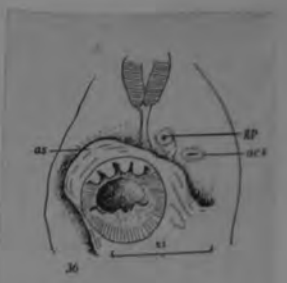
48. Opecoeloides elongatus n. sp.

Figs. 35, 36

HOST: *Pseudupeneus maculatus* (Bloch), red goatfish; in 2 of 20 hosts examined.

LOCATION: Intestine.

Description (based on 4 specimens; 2 dead and extended, 2 killed under coverglass): Length 1.260 to 2.925 mm, greatly elongate and more or less cylindrical, extended specimens about as thick as wide; width 0.165 to 0.217 mm. An extended specimen 1.260 mm long was immature; a flattened specimen of the same length contained a few eggs. Suckers, based on two flattened specimens of 1.260 and 1.500 mm: oral sucker 0.046 to 0.068 mm in diameter; acetabulum 0.078 to 0.082 mm in diameter; sucker ratio 1:1.2 to 1.7. Acetabulum with 4 anterior and 3 posterior papillae; acetabular stalk short. Forebody from 1/7 to 1/15 body length. Accessory sucker small, inconspicuous, without border, slightly to left closely anterior to acetabular stalk, slightly posterior and to left of genital pore. Prepharynx short; pharynx almost spherical, 34 to 54 μ long by 34 to 48 μ wide; esophagus longer than pharynx; intestinal bifurcation opposite acetabulum; ceca narrow; termination of ceca not observed. Genital pore slightly to the left, approximately at level of middle of esophagus. Testes elongate, unlobed, slightly separated; posttesticular space very long, twice or more the length of the forebody. Cirrus very short; cirrus sac lacking; seminal vesicle extending more than halfway between acetabulum and ovary. Ovary unlobed, separated from the anterior testis by a few vitellaria; uterus long, preovarian, with very short coils, intercecal; metraterm not observed. The distance from the acetabulum to ovary may be almost half body length. Eggs 51 to 59 by 31 to 34 μ. Vitellaria from a short distance posterior to acetabulum to posterior end of body; inter-



rupted opposite at least one of the testes, usually both; a few follicles between ovary and anterior testis; gland cells, resembling vitellaria but without yolk granules, extending to acetabular level. The excretory pore is not terminal but ventral a short distance anterior to the posterior end. It seemed to be dorsal in one specimen.

Discussion: Although this species has the same number of acetabular papillae as *O. brachyteleus* from the yellow goatfish, it is very different in a number of features: the body is much more elongate, the pharynx smaller, the accessory sucker less distinct, the posttesticular space much greater, the testes more elongate, and the vitellaria are not continuous opposite the testes. In most of these respects it differs also from the other species in the genus. *O. furcatus* is also elongate but has lobed testes and ovary and a very large accessory sucker.

The name *elongatus* is for the elongate shape of the body.

NOTE SEE REVERSE SIDE OF OPECOELOIDES BRACHYTELEUS PAGE FOR RECORD OF THIS SPECIES FROM PUERTO RICO.

Allocreadiidae

Anisoporus eucinostomi, new species (MANTER, 1940) von Wicklen, 1946

(Plate 36, figs. 32, 33)

Hosts: *Eucinostomus californiensis* (Gill) (type host)
Polynemus approximans Lay and Bennett

Location: Intestine

Localities: Port Utria, Colombia (type locality)
Bahia Honda, Panama

Number: 5 specimens from *E. californiensis*
One specimen from *P. approximans*

SPECIFIC DIAGNOSIS OF ANISOPORUS EUCINOSTOMI

Body smooth, tapering at each end but almost equally wide along most of its length, widest posterior to acetabulum; length 1.222 to 2.497; width 0.345 to 0.465. Forebody narrow, from 1/6 to 1/7 total body length. Oral sucker longer than wide, 0.109 to 0.144 in transverse diameter; acetabulum protuberant, each lip with 3 prominent lobelike papillae, length of acetabulum 0.144 to 0.210; sucker ratio probably about 2:3. A conspicuous accessory sucker, ventral, median or submedian, directly anterior to acetabular stalk, between acetabulum and genital pore. Accessory sucker with distinct pore and radiating muscles but lacking an outer membrane. Genital pore slightly to the left opposite base of pharynx.

Short prepharynx; pharynx 0.064 to 0.110 in length by 0.049 to 0.085 wide; esophagus muscular, 0.119 to 0.136 long, bifurcating dorsal to acetabulum; ceca unite near posterior end of body; anus near posterior tip of body.

Testes tandem, close together, in posterior half of hindbody, transversely extended, reaching almost to sides of body; posttesticular space sometimes longer, sometimes shorter than forebody. Cirrus sac lacking; cirrus short; prostatic cells few; seminal vesicle sinuous, extending to intestinal bifurcation or rarely as far as posterior edge of acetabulum. Ovary subtriangular, transversely extended, median, immediately pretesticular. Uterus largely intercecal, entirely preovarian; eggs 41 to 48 by 25 to 29 μ; no seminal receptacle. Vitelline follicles large, from near base of acetabular stalk to posterior end of body except for a short interruption opposite posterior testis and sometimes opposite anterior testis; ventral, dorsal, and lateral to ceca; filling posttesticular area. Excretory pore terminal or dorsoterminal, close to anus; anterior extent of excretory vesicle not determined.

Discussion. The genus Anisoporus was named by Ozaki in 1928 (Ozaki, 1928a). *A. cobraeformis,* the type, is the only other species described to date.

Anisoporus is very closely related to Opecoeloides Odhner, 1928. Opecoeloides was based on *Distomum furcatum* Brems. It possesses an accessory sucker between the acetabulum and the genital pore, and has 6 tentacles on the acetabulum. It agrees with Anisoporus except that the ceca open into the excretory vesicle rather than to the outside. Genitocotyle Park, 1937 is also a related genus. Genitocotyle has the accessory sucker but no tentacles on the acetabulum, and apparently its ceca end blindly. There is considerable doubt if either of these characters should be of generic rank (for example, the acetabular processes are not considered generic in Opecoelus, and the uroproct is not emphasized in the genus Stephanostomum). Anisoporus, Opecoeloides, and Genitocotyle should all be considered to be in the subfamily Opecoelinae.

A. eucinostomi is very different from *A. cobraeformis* in shape of the forebody, in location of the accessory sucker which is median rather than lateral, in lacking a genital sucker, in more anterior extent of the vitellaria, and in longer esophagus.

OPECOELIDAE

Allocreadiidae.
Allocreadiinae

Cymbephallus fimbriatus Linton, 1934

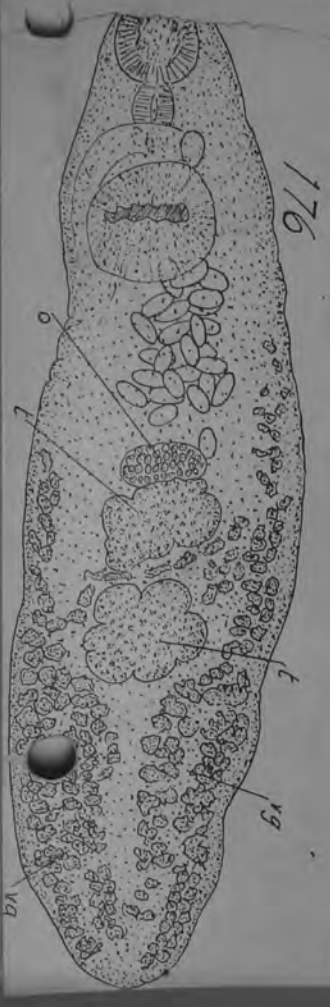
Syn.: Distomum vitellosum Linton, 1899:462
1904:388,390,399,figs.176-178.

Description from Linton, 1934:

Body elongate, varying in diameter; neck short, more or less conical; ventral sucker larger than oral, prominent, sometimes pedicellate, surrounded by a border of short papillae; esophagus longer than pharynx; ceca to posterior end; genital pore in front of ventral sucker, to left of median line; opening of ejaculatory duct a muscular sucker; seminal vesicle elongate, curved, from 1/3 to more than ½ distance between ventral sucker and ovary; testes tandem, separated by a short distance, in some cases lobed; ovary near edge of anterior testis, usually not lobed. Vitellaria diffuse reaching to about halfway betweb ovary and ventral sucker. Eggs 60 by 30. Maximum length of body about 5 mm.
Hosts: Menticirrhus saxatilis at Woods Hole.
Bairdiella chrysura, Menticirrhus americanus and Sciurus ocellatus at Beaufort.

Reported by Manter from Coelorhynchus carminatus or Chalinura occidentalis from Tortugas.

Differs from T. vitellosus in larger size, in more numerous acetabular papillae, in lobed testes, larger ovary and the more posterior extent of the seminal vesicle and not so tapering posteriorly.



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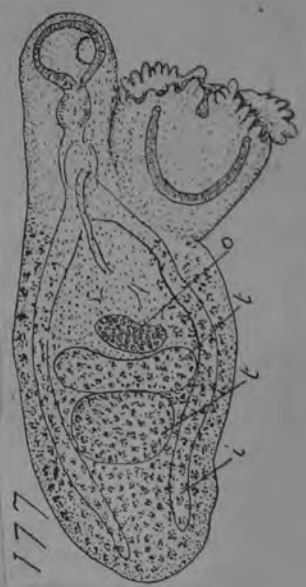

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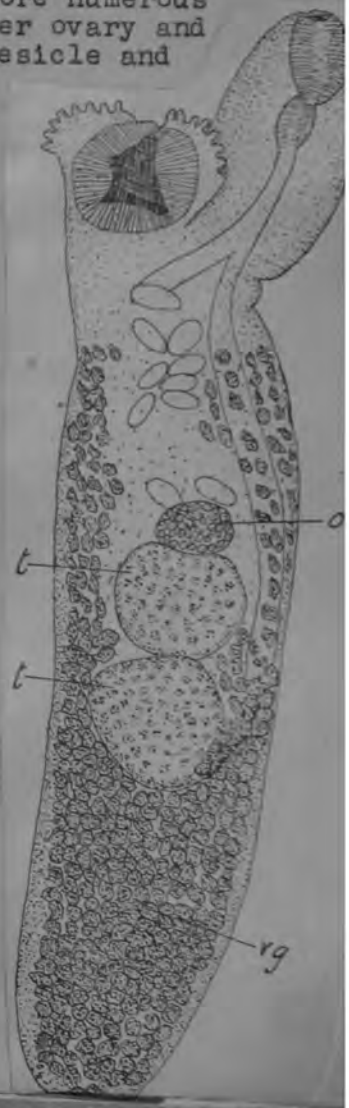


also Grand Isle La

-OVER-

FAMILY OPECOELIDAE Ozaki, 1925

Opecoeloides fimbriatus (Linton, 1934) Sogandares-Bernal and Hutton, 1959

Synonym: Cymbephallus fimbriatus Linton, 1934

*Hosts: Bairdiella chrysura; Menticirrhus americanus; *M. focaliger; M. littoralis; Micropogon undulatus; Sciaenops ocellata*

Site: intestine

Localities: Alligator Harbor, Mud Cove; St. George Island

The original description by Linton is inadequate and the species has been redescribed by Sogandares-Bernal and Hutton (1959b), and by Kruse (1959) from Linton's type specimen and additional ones collected from Apalachee Bay. The single specimen from *M. micropogon undulatus* has a smaller sucker ratio (1:1.17) and fewer acetabular papillae (exact number cannot be determined). On the basis of these features, it should perhaps be referred to *O. polynemi* Von Wicklen, 1946. Sogandares-Bernal and Hutton (1959c) questioned the validity of *O. polynemi*: in sucker ratio (1:1.25) it comes close to the lower limit found in some of our specimens from the other hosts (range 1:1.3-1.8). The papillae on the acetabulum may be retracted and thus may be indiscernible. Kruse (1959) reported "four lobes each having from five to nine papillae" and Sogandares-Bernal and Hutton (1959b, Fig. 13) show 6, 6, 6, and 8 papillae per lobe. No such variation, however, is reported by Von Wicklen in her 10 specimens of *O. polynemi*.

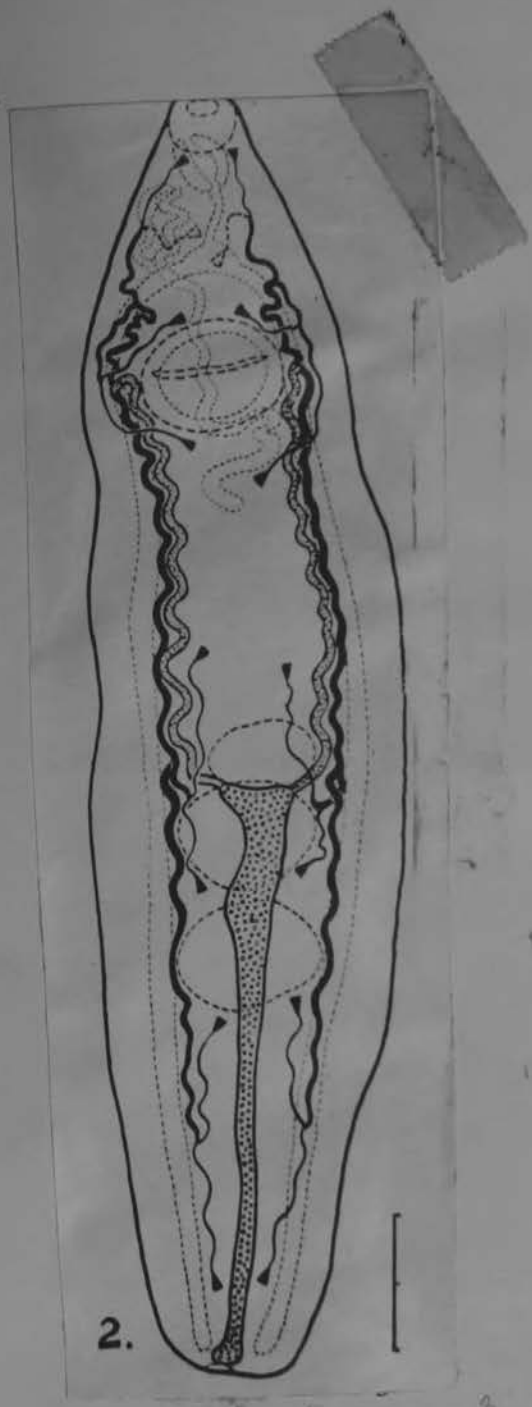
APALACHEE BAY, GULF OF MEXICO
FROM NAHHAS AND SHORT (1965)

Opecoeloides fimbriatus (Linton, 1934) Sogandares-Bernal and Hutton, 1959

Synonym: Cymbephallus fimbriatus Linton, 1934

Host: Menticirrhus americanus
Site: Intestine
Locality: Pensacola Bay, Florida

From Nahhas and Powell, 1971



Cymbephallus fimbriatus Linton, 1924 as drawn by Hopkins, 1941 to show excretory system. Collected at Beaufort, probably from Bairdiella chrysura

Family Opecoelidae Ozaki, 1925

4. *Opecoeloides fimbriatus* (Linton, 1934) Sogandares & Hutton (in press) 1959
(Fig. 18)

Host: *Bairdiella chrysurus* (Lacepede); silver-perch; family Sciaenidae
Incidence of Infection: In 1 of 9 hosts
Number: One
Location: Pyloric cecum
Locality: Tarpon Key, Boca Ciega Bay, Florida

Discussion: Sogandares & Hutton (in press) have reported what they believe to be the metacercaria of *O. fimbriatus* encysted in the cephalothoracic cavity of the shrimp, *Penaeus duorarum* Burkenroad. Since this report, we have found a single adult of *O. fimbriatus* in a pyloric cecum of *Bairdiella chrysurus*.

The specimen of *O. fimbriatus* pictured in Figure 7 has a contracted anterior and posterior body. Aside from the fact that a uroproct is formed, the specimen is believed to be conspecific with the holotype of *O. fimbriatus* (USNM Helm. Coll. No. 8266) which we have examined. The acetabular papillae in the holotype of *O. fimbriatus* are somewhat retracted.

Linton (1905) pictures a specimen of *O. fimbriatus* (Fig. 178) from Beaufort, North Carolina. Hopkins (1941) reported both *O. fimbriatus* and *O. vitellosus* in *Bairdiella chrysurus* from the same locality. Sparks (1958) examined *Bairdiella chrysurus* in Grand Isle, Louisiana, but did not report *O. fimbriatus* from that ~~area~~ host. ~~Precluding the chance that *O. polynemi* Von Wicklen, 1946, is not a synonym of *O. fimbriatus*~~, this report appears to be the ~~northernmost~~ southernmost record of the species in the Gulf of Mexico.

From Sogandares & Hutton, 1959

FAMILY OPECOELIDAE Ozaki, 1925

8. *Opecoeloides fimbriatus* (Linton, 1934) n. comb.
(Figs. 12 to 16)

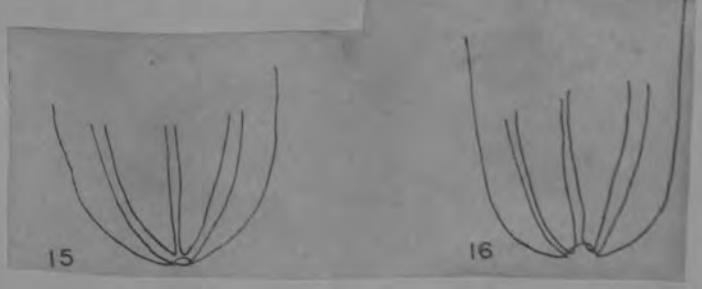
Host: *Penaeus duorarum* Burkenroad; pink shrimp; family Penaeidae.
Location: Encysted in various sites or organs within cephalothorax.
Locality: Gandy flats, Tampa Bay, Florida.

This trematode was originally reported from the pink shrimp by Woodburn *et al* (1957). They correctly identified the species to familial level and furnished a photomicrograph. This study presents a more detailed account of the metacercaria from the pink shrimp.

Manter (1934) described *Cymbephallus fimbriatus*, ascribing the name to Linton *in press*. Later (1941) Hopkins reported the flame cell pattern of *Cymbephallus fimbriatus* Linton, 1934 collected from *Bairdiella chrysura* in Beaufort, North Carolina. Von Wicklen (194X) named the genus *Fimbriatus* with *Cymbephallus fimbriatus* Linton, 1934 (in Manter, 1934) as type species. Von Wicklen (1947) did not actually observe the type specimen of *Fimbriatus fimbriatus* (Linton, 1934), (USNM No. 8266), but instead had one of her colleagues, Mrs. Marjorie Jean Raecke Prince make the observations. Mrs. Prince observed 2 ani in Linton's type material. On the basis of the presence of two ani in *Cymbephallus fimbriatus*, Von Wicklen erected the genus *Fimbriatus*. The genus was, in addition, characterized by possessing an accessory sucker, and a protrusible acetabulum with fimbriated lobes. Our metacercarial specimens from the shrimp possess all of the characteristics of *Fimbriatus fimbriatus* (Linton, 1934) Von Wicklen, 1946 except eggs are lacking in the uterus and vitellaria are undeveloped. The presence of 2 ani or of a uroproct is dependent upon the contraction of the posterior end of the body in our specimens. When live metacercariae were placed under slight coverglass pressure and a small amount of neutral red stain added, the intestinal contents as well as the wall of the excretory vesicle were colored red. The presence of a uroproct was quite obvious in the first specimen observed. A second specimen possessed what appeared to be ani. At first it was believed that these two specimens represented 2 different genera. Close observation of the latter specimen showed that the two ani and the excretory vesicle formed a uroproct by involution of the posterior end of the body (Figs. 14 to 16). Observations of additional specimens under purposely varied coverslip pressure showed that the intestinal contents could be forced into the excretory bladder when the uroproct was formed, (Figs. 14 and 15). When the posterior end of the worm was dilated in the same specimen (Fig. 16), the intestinal contents would extrude from each cecum directly to the outside. We believe that when the uroproct is formed very close to the posterior end of the body it does not serve as a good generic character. Perhaps the presence of ani or of a uroproct may be of generic value when there is a distinct separation of the ani from the excretory pore. Since *Fimbriatus* is monotypic, and the presence of ani or of a uroproct is dependent upon contraction of the posterior end of the body, *Fimbriatus* Von Wicklen, 1946 is here considered a synonym of *Opecoeloides* Odhner, 1928. *Fibriatus fimbriatus* (Linton, 1934), Von Wicklen, 1946, becomes *Opecoeloides fimbriatus* (Linton, 1934) n. comb. Hopkins (1941) has indicated that *O. vitellosus* (Linton, 1934) Von Wicklen, 1946 may be distinguished from *O. fimbriatus* by the presence of minute rodlets in the parenchyma of the former species. Our metacercarial specimens of *Opecoeloides fimbriatus* lacked these minute parenchymal rodlets. For this and the other above mentioned reasons, our specimens have been considered to be *Opecoeloides fimbriatus*.

1946
1946

From: Sogandares-Bernal and Hutton (1959)



Opecoeloides fimbriatus (Linton, 1934)
Sogandares-Bernal and Hutton

Description. — Body elongate, broadly rounded posteriorly, 1.28 to 4.62 long by 0.60 to 0.84 wide. Oral sucker well developed, 0.12 to 0.26 in diameter, located on antero-ventral extremity. Ventral sucker larger than oral, 0.21 to 0.35 in diameter, pedunculated, surrounded by raised border made up of four lobes each having from five to nine papillae, main body of sucker protruding as two prominent papillae at the junction of the four lobes. Small accessory sucker with limiting membrane, anterior to ventral sucker, 0.08 to 0.04 in diameter. Pharynx broadly ovate, 0.09 by 0.14; esophagus longer than pharynx; intestinal ceca extending to the posterior end and emptying separately into the excretory vesicle or opening separately to outside depending upon the contraction of the body. Genital atrium common, muscular, genital pore immediately in front of accessory sucker. Testes two, tandem, usually lobed, post-equatorial; sperm ducts long, uniting at seminal vesicle, 1.3 to 1.2 the distance from ovary to bifurcation of gut. Seminal vesicle composed of short bulbous posterior portion and narrow, elongate anterior portion which connects to muscular cirrus. Ovary anterior to fore-testis, usually not lobed; oötype and Mehlis' gland slightly anterior to ovary; uterus moderately folded, lying mostly in direct line between ovary and genital pore; eggs about 0.06 by 0.03. Vitelline reservoir at the dorsal, anterior border of the ovary; vitellaria filling the body posterior to the testes, extending laterally along the margins to a point about half-way between the ovary and ventral sucker. Excretory vesicle a long sac-shaped structure that extends anteriorly to anterior border of first testis, with two main collecting tubules emptying into the antero-lateral corners.

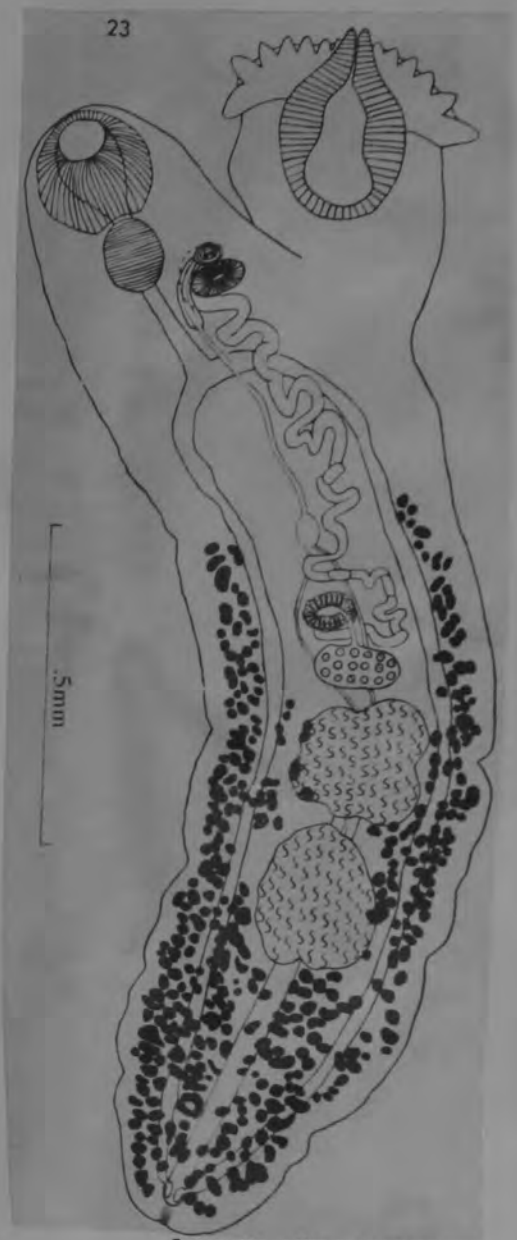
Hosts.—Adults in *Menticirrhus saxatilis*, *M. americanus*, *Bairdiella chrysura*, *Micropogon undulatus* and *Sciaenops ocellata*. Metacercariae in *Penaeus duorarum*, *P. setiferus* and *Trachypeneus constrictus*.

Location.—Adults in intestine, metacercariae in coverings and other tissues surrounding the digestive gland, stomach, heart, gonads, and intestine, also in tissue of the head region and tissues next to the lateral and dorso-lateral portions of carapace.

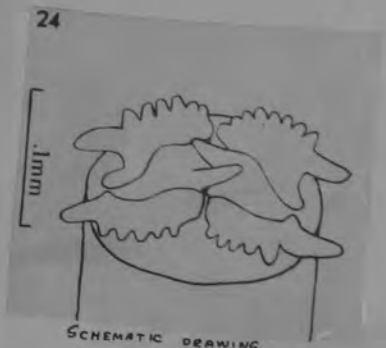
Number. — Average number of metacercarial cysts per shrimp 10, range 2 to 97.

Locality.—Atlantic and Gulf Coasts of United States.

All details of anatomy are not visible in the immature specimens. For this reason as well as to be reasonably certain of the indentification of this metacercaria, the writer examined the adult type specimens. (U. S. National Museum No. 8266) from which Linton (1934) described *Cymbephallus fimbriatus*. This study revealed certain errors in Linton's description. His specimens were



EXCYSTED METACERCARIA



SCHEMATIC DRAWING
OBLIQUE VIEW OF SURFACE

—OVER—

not as favorable for morphological studies as some in the writer's collection. The species is therefore redescribed from the type specimens and from whole mounts and serial sections of metacercariae obtained in the present work. Data are also included from Linton (1934, 1942) and Hopkins (1941).

The writer's description differs from Linton's (1934) in the following ways: (1) A more complete description is given of the ventral sucker which in Linton's type specimens was retracted. (2) The ceca are described as emptying separately into the excretory vesicle which empties to the outside rather than ending blindly as Linton described. (3) A description is given of the excretory vesicle which Linton omitted and which agrees with the description by Hopkins (1941) of the same species. (4) The ejaculatory duct is described as opening into a common genital atrium along with the uterus rather than opening through the accessory sucker as Linton described.

The fact that this trematode has an accessory sucker, ceca which empty into the excretory vesicle, a pedunculated acetabulum with papillae and no cirrus pouch places it in the genus *Opecoeloides* Odhner, 1928. Von Wicklen (1946) reported that each cecum opened separately to the outside. Consequently she established a new genus for this trematode, giving it the name *Fimbriatus fimbriatus*. In the type specimens examined by the writer the vitellaria obscured the posterior ends of the ceca. Frontal sections and mounts of metacercaria showed that the ceca empty into the excretory vesicle.

Sogandares-Bernal and Hurton (1959) observed that the posterior tips of the ceca moved to positions where each cecum and the bladder emptied separately to the outside when the metacercaria was extended and then returned to the normal position of emptying into the excretory vesicle, when the worm contracted. The writer also observed this phenomenon (figs. 25-27) and saw particles pass from the ceca to the excretory vesicle and then to the outside when the worm contracted, and directly to the outside when extended. The writer fixed a group of 55 metacercariae with a considerable amount of coverslip pressure. One of the 55 was fixed in the extended position with the ceca emptying separately to the outside and several were fixed in intermediate positions. A specimen fixed in a flattened and extended position with the ceca emptying directly to the outside could account for a description of this species as having two ani; however, the writer did not observe this condition in the type specimens.

The remaining life cycle stages for *Opecoeloides fimbriatus* are not known. Opecoelid cercariae possess a stylet, lack eyespots and body spines, have a short glandular tail, possess a thick-walled excretory vesicle that has a very uneven lumen due to protrusion of large wall cells into it, have a 2 [(2 + 2) + (2 + 2)] excretory formula, and develop within sporocysts in prosobranch snails (Cable 1956a, 1956b). The life cycle of *Anisoporus manteri* Hunninen and Cable, 1940, which Von Wicklen (1946) synonymized with *Opecoeloides vitellosus* (Linton, 1900) has been worked out by Hunninen and Cable (1941) and is probably similar to the life cycle of *O. fimbriatus*. The adult of *O. vitellosus* has been reported in over 60 species of marine fishes (Linton, 1934; Hunninen and Cable, 1940); however, Von Wicklen (1946) stated that some of the trematodes identified as *O. vitellosus* are other species. The cercaria of *O. vitellosus* occurs in the marine gastropod *Mitrella lunata* (Say) and the metacercaria in the marine amphipods, *Carinogammarus mucronatus* (Say) and *Amphithoe longimana* Smith.

From KRUSE (1959)

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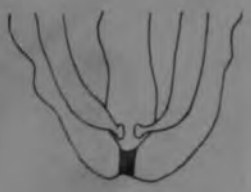

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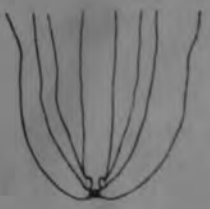

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Opecoeloides manaarensis n.sp. (Figs. 5 and 6) N.K. GUPTA, 1956

Opecoeloides manaarensis was found in the intestine of a marine fish, *Upeneoides* (Tamil name—Nagrai). It is a thin elongated worm, 3·45 mm. in length and 0·25 mm. in maximum breadth, which is across the level of the anterior testis. The body cuticle is smooth. The oral sucker, 0·072 × 0·072 mm., is placed at the anterior end of the body. Its opening is, however, directed subterminally. It is about half the size of the acetabulum. The prepharynx is absent apparently. The pharynx measures 0·057 × 0·068 mm., and is followed by an oesophagus, 0·13 mm. in length. The two intestinal caeca run along the sides of the body and in the post-testicular region they are densely covered with vitellaria.

The acetabulum is situated on a short pedicle and measures 0·14 × 0·15 mm. It is larger than the oral sucker and is provided with nine well-marked papillae, of which four are placed anteriorly and the remaining five posteriorly. The anterior papillae are covered by a thin membranous fold. A similar fold extends from the body along the posterior border of the acetabulum but it only covers two of the papillae. All these papillae can be seen under different foci. Between the genital pore and the acetabulum there lies a very small and indistinct accessory sucker.

There are two irregularly shaped testes placed one behind the other in the anterior region of the second half of the body. The anterior testis is 0·19 × 0·18 mm., while the posterior is 0·26 × 0·19 mm. in size. The vesicula seminalis is sinuous and extends for about half or even more than half the distance between the acetabulum and the ovary. It is followed by the pars prostatica and the ejaculatory duct. The cirrus is protrusible and opens along the metraterm at the genital opening which is situated on the right lateral body margin at about the middle of the pharynx and the acetabulum.

The ovary is somewhat triangular in shape and lies in front of the testes, in the hinder region of the first half of the body. It measures 0·14 mm. in length and 0·11 mm. in maximum breadth. The Mehlis' gland complex and the yolk reservoir lie in front of the ovary. The vitellaria consist of fine follicles which extend along the lateral sides of the body from the level of the base of the vesicula seminalis back to the posterior extremity of the body. In the post-testicular region, the vitelline follicles are seen extending inwards filling the space between the body wall and the excretory vesicle. The uterus has an ascending limb only, which is both pre-ovarian and intercaecal in position. The metraterm runs alongside the cirrus to open at the genital pore. The eggs are operculate. A few of them seem to have collapsed. They measure 0·049–0·053 × 0·034–0·041 mm.

Relationships:—The genus *Opecoeloides* Odhner, 1928, comprises the species, namely *Opecoeloides furcatus* (Bremser, 1819), *O. vitellosus* (Linton, 1900) Von Wicklen, 1946, *O. eucinostomi* (Manter, 1940) Von Wicklen, 1946, *O. polynemi* Von Wicklen, 1946, *O. polyfimbriatus* Read, 1947, *O. brachyteleus* Manter, 1947, *O. elongatus* Manter, 1947 and *O. thyrinopsi* (Manter, 1940) Manter, 1947. The new species *Opecoeloides manaarensis* is characterised by having nine papillae on its acetabulum, of which four are placed anteriorly and five posteriorly; and by a somewhat triangular ovary. It, therefore, stands apart from all the species already known

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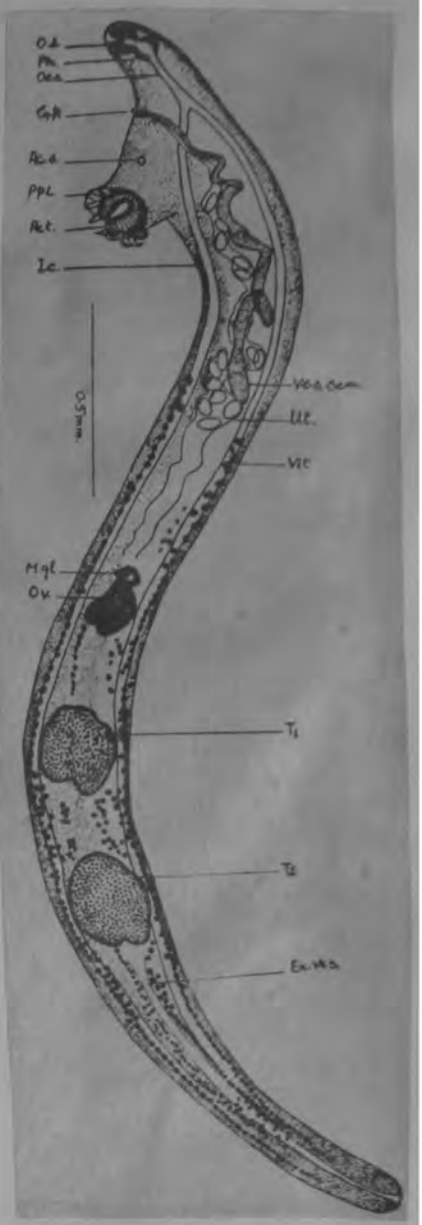


If no accessory sucker, this may be a species of Paropecoeloides — host etc. too.

except Opecoeloides vitellosus with which it resembles closely Linton

(1900) while describing *D. vitellosum* did not make mention of the papillae on the acetabulum. A year later, the same author emended his previous description and stated that the acetabulum of that parasite is notched at its posterior edge so as to form two or three blunt digitate lobes. Four years afterwards he further supplemented the description by describing the genital sucker in one specimen. In 1934, he again modified the earlier description of the same species by stating that the acetabulum is pedicellate and possesses four or five lobes on its posterior aspect and about four on the anterior. In 1940, he reiterated the same account but in the diagrams (Nos. 18 and 19) given on Plate 2, he has shown the presence of three anterior and two posterior papillae.

Von Wicklen (1946) studied the material of this species obtained from the United States National Museum Helm. collection (No. 70760, old number 6351) and noted the following features:

(i) The accessory sucker is quite distinct but without any limiting membrane and has no connection with the genital ducts.

(ii) The acetabulum bears three papillae on its anterior lip and two on the posterior lip.

(iii) No anus could be seen and the ends of the caeca are obscured by the vitellaria.

It appears that No. (ii) character does not tally with the sketch given by Linton (1940). So it is confirmed that the acetabulum of *O. vitellosus* has five papillae only. Thus the new species described in this paper is quite distinct in number of acetabular papillae in addition to the shape of the ovary and measurements of the organs.

Host: *Upeneoides* sp. (Nagrai).

Location: Intestine.

Locality: Gulf of Manaar (India).

Opecoelidae

Opecoeloides pedicathedrae Travassos, Freitas & Bührnheim, 1966

(Est. 5, figs. 12-15, est. 6, figs. 16-17)

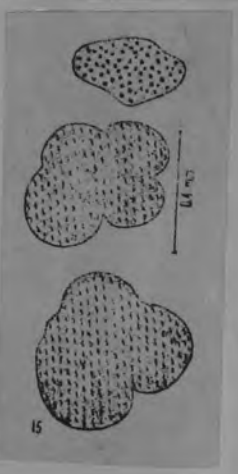
Opecoeloides pedicathedrae Travassos, Freitas & Bührnheim, 1966: 1-3, figs. 1-2

Trematódeos de corpo alongado ou não, com cutícula não espinhosa e extremidades arredondadas; medem 2,37 a 6,56 mm de comprimento por 0,82 a 0,83 mm de largura. Ventosa oral subterminal, com 0,21 a 0,27 mm de comprimento por 0,20 a 0,28 mm de largura. Acetábulo embebido no corpo ou saliente, pedunculado; mede 0,35 a 0,48 mm de comprimento por 0,27 a 0,43 mm de largura e apresenta 6 processos papiliformes dispostos em dois grupos de 3 processos cada um: um anterior e outro posterior. Relação entre a ventosa oral e o acetábulo varia de 1:1,51 a 1:1,65. Ventosa accessória presente, pré-acetabular, situada logo acima do pedúnculo do acetábulo; mede 0,08 a 0,13 mm de comprimento por 0,11 a 0,13 mm de largura. Pré-faringe presente, curta. Faringe presente, musculosa, com 0,11 a 0,16 mm de comprimento por 0,10 a 0,13 mm de largura. Esôfago presente, delgado. Cecos intestinais mais ou menos retilíneos, atingindo a extremidade posterior do corpo, onde se abrem na vesícula excretora, constituindo um uroprocto. Poro genital situado logo acima da ventosa accessória, na zona bifurcal quando o acetábulo está desenvaginado e na zona faringeana quando êsse órgão está retraído no corpo. Bôlsa do cirro ausente. Vesícula seminal presente, com 0,40 mm de comprimento por 0,13 mm de largura; liga-se a um canal ejaculador mais ou menos sinuoso, de 1,12 mm de comprimento por 0,04 mm de largura, que vai ter a um cirro de 0,27 mm de comprimento por 0,07 mm de largura. Testículos pós-equatoriais, pós-ovarianos, com zonas afastadas ou em contato, intercecais, com campos coincidentes, medindo o testículo anterior 0,21 a 0,48 mm de comprimento por 0,40 a 0,45 mm de largura e o posterior 0,27 a 0,48 mm por 0,40 a 0,45 mm. Ovário pós-acetabular, pré-testicular, intercecal, com zona afastada ou parcialmente coincidente com a do testículo anterior, no campo testicular e medindo 0,13 a 0,24 mm de comprimento por 0,29 a 0,33 mm de largura. Glândula de Mehlis não evidenciada. Espermateca e canal de Laurer ausentes. Vitelodutos reunidos na zona pré-ovariana. Útero anterior às gônadas, com alças intercecais. Ovos amarelos, operculados, com 0,060 a 0,063 mm de comprimento por 0,037 a 0,040 mm de largura. Vitelinos constituídos por folículos numerosos, arredondados, que se estendem da parte posterior da zona da vesícula seminal para trás, atingindo a extremidade posterior do corpo; são extra-cecais, cecais e inter-cecais, laterais até a zona testicular posterior e ocupam tôda a área pós-testicular do corpo, mais ou menos confluindo na linha média. Poro excretor (abertura do uroprocto) terminal. Vesícula excretora não observada com detalhe.

Habitat — Estômago e intestino (nova localização) de **Umbrina coroides** Cuv. & Val.

Proveniência — Escola de Pesca Caboclo Bernardo, Santa Cruz (Oceano Atlântico), Estado do Espírito Santo, Brasil.

Material estudado depositado na Coleção Helmintológica do Instituto Oswaldo Cruz sob os números 29 976 (tipo) e 29 977 (parátipo), 30 075 e 30 076.



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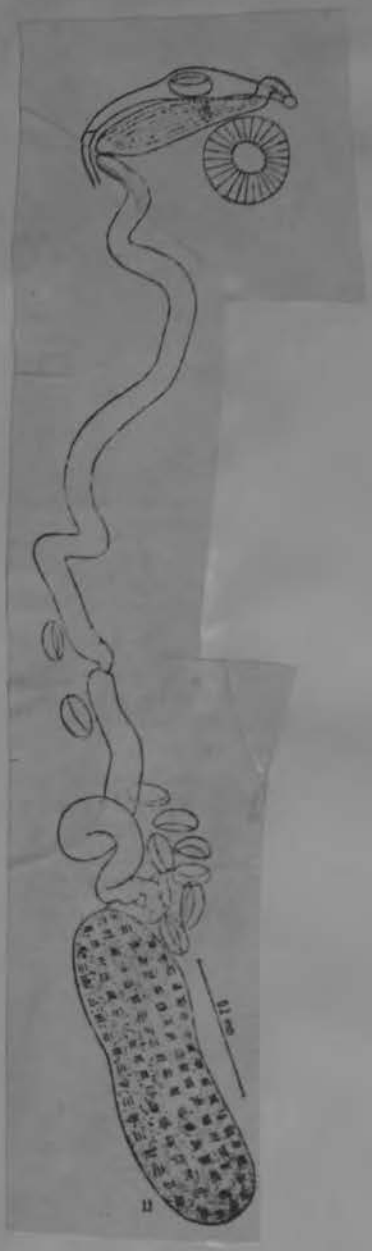


Reprinted from THE JOURNAL OF PARASITOLOGY, June, 1947, Vol. 33, No. 3, pages 231–233.

A NEW TREMATODE, *OPECOELOIDES POLYFIMBRIATUS* N. SP., FROM THE LIZARD FISH, *SYNODUS FOETENS**

CLARK P. READ

During the examination of fishes from Galveston Bay, three specimens of a new trematode belonging to the genus *Opecoeloides* were recovered from the intestine of a lizard fish, *Synodus foetens*.

The genus *Opecoeloides* was defined by Odhner (1928) with *Distomum furcatum* Bremser, 1819 (in Rudolphi, 1819) as the type species. The genus was discussed by Von Wicklen (1946) who described *O. polynemi* Von Wicklen, 1946, and concluded that the inadequately defined genus *Cymbephallus* Linton, 1934, is a synonym of *Opecoeloides*. Von Wicklen further demonstrated that *O. manteri* (Hunninen and Cable, 1940) Hunninen and Cable, 1941, is a synonym of *O. vitellosus* (Linton, 1900) Von Wicklen, 1946, and that *Anisoporus eucinostomi* Manter, 1940, should be *O. eucinostomi* (Manter, 1940) Von Wicklen, 1946.

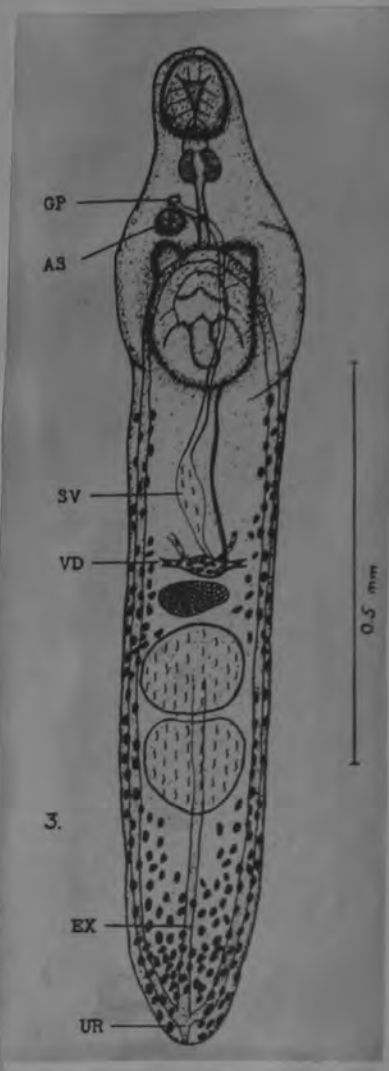
The chief characters of the genus *Opecoeloides* are: absence of a cirrus pouch; presence of an accessory sucker; ceca which open into the excretory vesicle; and a stalked acetabulum with papillae.

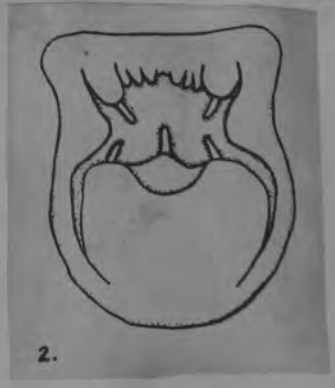
Opecoeloides polyfimbriatus n. sp.
Figs. 1–3

Diagnosis: Opecoeloides: Body smooth, flattened, and rounded at both ends. Length 1.03–1.20 mm. Oral sucker 0.060–0.084 mm in diameter. Acetabulum in anterior third of body, 0.12–0.15 mm in diameter, provided with eight anterior and three posterior papillae; the two lateral lobes lack papillae. Sucker ratio approximately 1:1.8. A short prepharynx present; pharynx approximately spherical, 0.043–0.058 mm in diameter. Esophagus 0.11–0.14 mm in length, bifurcating at level of anterior border of acetabulum. Accessory sucker, 0.036–0.042 mm in diameter, located on level with and to right of esophagus, surrounded by a distinct limiting membrane. Ceca extend almost to posterior end of body, uniting with excretory vesicle. Excretory vesicle sac-shaped, extending anteriorly to level of ovary; excretory pore subterminal and dorsal. Genital pore immediately anterior to accessory sucker. Testes, 0.104–0.107 mm in diameter, in posterior half of body, in tandem, round or slightly lobed. Seminal vesicle long, extending to two-thirds distance between genital pore and ovary. Cirrus weakly developed. Post-testicular space 23–25% of total length of body. Ovary, 0.052–0.065 mm in diameter, ovoid, median, and anterior to testes. Uterus anterior to ovary, with few coils. Follicular vitellaria fill lateral fields from base of acetabular stalk to posterior end of body, coalescing intercecally posterior to testes. Four vitelline ducts converge immediately anterior to ovary. Eggs, in utero, 51–63 μ by 26–31 μ.

Host: Synodus foetens.
Location: Intestine.
Locality: Gulf of Mexico, Galveston, Texas.
Type specimen: U.S.N.M., Helminth. Coll. No. 30958.

It should be noted that in *O. polyfimbriatus* the accessory sucker is on the right side of the body, while in other members of the genus it is on the left. Since only 3 specimens of *O. polyfimbriatus* were examined, this may not be a consistent character. *O. polyfimbriatus* is further compared with other species of the genus in Table 1.





Opecoeloides

Anisoporus thyrinopsi, ~~new species~~ MANTER, 1940
(Plate 36, fig. 34)

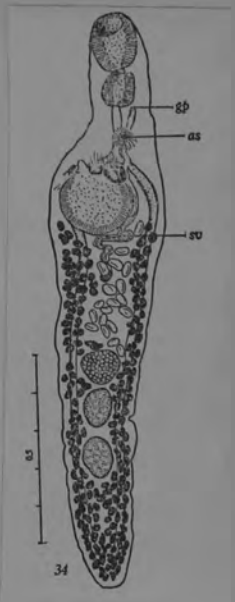
Host: *Thyrinops pachylepis* (Günther)
Location: Intestine
Locality: Port Utria, Colombia
Number: One specimen in one of 10 hosts

SPECIFIC DIAGNOSIS OF ANISOPORUS THYRINOPSI

Body slender, widest at acetabular level, 1.538 by 0.307; forebody 0.412. Oral sucker longer than wide, 0.120 in transverse diameter; acetabulum 0.195 in diameter, with three pairs of papillae. Genital pore to the left, opposite base of pharynx. Accessory sucker to the left, midway between genital pore and acetabulum. Short prepharynx; pharynx 0.097 long by 0.048 wide; esophagus 0.135 long; intestinal bifurcation at anterior edge of acetabulum. Testes small, smooth, longer than wide, tandem, separated by a short distance; posttesticular space about ⅓ body length. Cirrus short; pars prostatica long but with few cells; seminal vesicle sinuous, extending almost halfway between acetabulum and ovary. Ovary subspherical; vitellaria from posterior edge of acetabulum to posterior end of body; eggs 41 to 46 by 28 to 29 μ.

The name *thyrinopsi* is for the host. Being based on a single specimen, this species is named more or less tentatively.

Comparisons. This species is most like *A. eucinostomi.* It differs in more slender body, more tapering hindbody, shape of testes, and much longer seminal vesicle.



FROM: ALLAN HANCOCK PACIFIC EXPEDITIONS, Vol. 2, No. 14

Opecoeloides vitellosus (Linton,1900)

Syn. Opecoeloides manteri(Hunninen & Cable,1941)

Synonym: Anisoporus manteri Hunninen & Cable,1941

Small elongate worms; length 0.74 to 2.32 mm. width 0.28 to 0.46 mm. Oral sucker 0.07 to 0.14; acetabulum in anterior third of body; 0.12 to 0.17 mm. provided with three anterior and two posterior papillae; sucker ratio approximately 2:2.5. Prepharynx very short; pharynx spherical, 0.07 to 0.11 mm.; esophagus length 0.07 to 0.18; ceca uniting with excretory vesicle. Testes tandem, in posterior half of body; cirrus sac lacking. Ovary ovoid; seminal receptacle lacking. Uterus preovarian with few coils; vitelline follicles beginning just behind acetabulum; two accessory vitelline ducts extending transversely, one anterior to ovary, the other posterior to testes. Eggs 62 to 68 by 35 to 40 μ. Excretory vesicle sac shaped; excretory formula 2 (2 2) (2 2) .

Hosts: Syngnathus fuscus Storer, northern pipefish
Paralichthys dentatus (Linn.) flounder
Hippoglossoides platessoides (Fab.), sand dab
Apeltes quadracus (Mitchill), four-spined stickleback
Fundulus heteroclitus (Linn.) killifishes
F.majalis (Walbaum) killifish

Locality: Cape Cod, Mass.

Acetabulum pedunculated.
Genital pore at posterior end of pharynx

Allocreadiidae
Allocreadiinae

Opecoeloides
Cymbephallus vitellosus (Linton 1900) von Wicklen, 1946

Syn.: Distomum vitellosum Linton
1899:290,416,fig.38,39 and 333-340.
1904: 335
Proc. U.S.Nat.Mus.,33:105.

The following is from Linton,1934:

Great variety of contraction shapes. Living forms with width about 1/3 length, but they may elongate until 6 times longer than wide. Neck short,conical,often reflected dorsad. Posterior end frequently tapering to a blunt point. Oral sucker: ventral sucker ratio about 5:8. Ventral sucker with a raised border which may appear sinuous in outline or may bear 4 or 5 lobes on the posterior border and 4 on the anterior border, often inconspicuous in mounted specimens. In turgid specimens the ventral sucker may be more or less pedicellate. Maximum length in balsam about 3.5 mm. Prepharynx very short or none; esophagus as long as or longer than pharynx; intestinal rami reach nearly to posterior end usually hidden by vitellaria. Genital pore in front of ventral sucker to left of median line; the ejaculatory duct terminates in what has the appearance of a muscular sucker-like structure at the anterior border of which is the opening of the metraterm. The seminal vesicle extends 1/3 or more of the distance between ventral sucker and ovary. Testes tandem about midway between ventral sucker and posterior end, usually circular or oval, occasionally subtriangular and rarely slightly lobed. Ovary near anterior testis more or less elliptical in shape. Eggs (average of 24 specimens from 16 different hosts) 53 by 29 μ, maximum 63 by 33, minimum 45 by 27 μ.

Reported from 34 species of Woods Hole fishes, from 15 species of Beaufort fishes and from 5 species of Bermuda fishes.

N.B. It seems certain that Linton is including under this species several species and it is probable that of the 3 figures he gives in 1940 at least two and perhaps all three are not C.vitellosus. Therefore the original description and host are important. Linton (1899:290,figs. 38,39): "Body smooth, subcylindrical;neck short,slender,conical,very contractile in life,in preserved specimens arched above,concave and hollowed out beneath; mouth subterminal,aperture transverse;pharynx immediately following oral sucker,elongated;esophagus not made out,but either none or very short; branches of intestine simple,not spacious,extending to near posterior end;acetabulum much larger than oral sucker,prominent,aperture contracts to small,transverse opening with puckered margins,situated about anterior third in preserved specimens. Aperture of reproductive organs in front of acetabulum,on left of median line; testes two,moderately large, median,approximate,and situated near posterior end;ovary in front of testes anterior testis and touching it,lying on median line but a little toward the right;vitellaria consisting of numerous rather large subangular masses,which fill the body behind the testes and extend along the sides as far forward as the acetabulum; ova not numerous and rather large lying between

(over)

C. vitellosus (cont.)

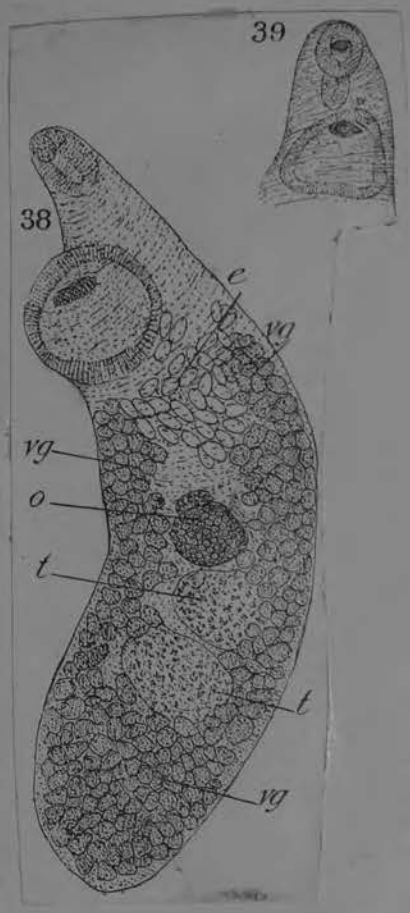
ovary and acetabulum. U.S. Nat. Mus. No. 6513

Measurements (specimen in glycerine)
length: 1.42
Oral sucker: 0.08
Acetabulum: 0.25
Eggs: 52 by 31 μ

(specimen in balsam)
length 0.88
oral sucker: 0.10
acetabulum: 0.17
body width: 0.25
neck length: 0.22
Eggs: 58 by 34 μ

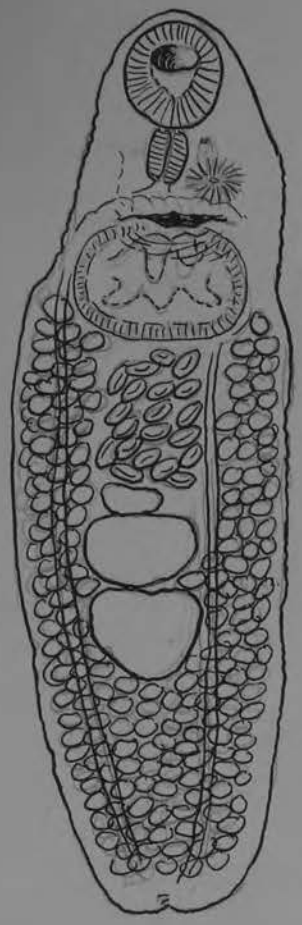
Host: Merluccius bilinearis, the hake (33 hosts reported by Linton (1940) at WoodsHole !!!)

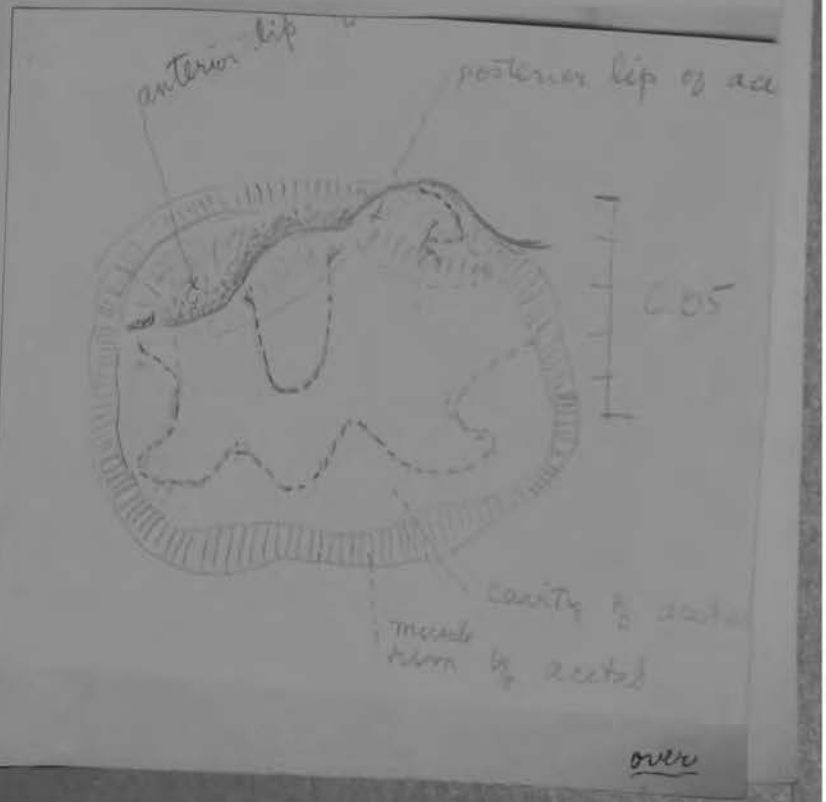
Locality: Woods Hole.



Distomum vitellosum Linton, 1900

Measurements on type specimen: (original):
Length: 0.931; width 0.285 mm.
Oral sucker 0.105; acetabulum 0.175 mm.
Egg 56 by 25 μ
postesticular space 0.225 mm.
diameter of accessory sucker about 60 μ.
Anterior lip with 3 papillae; posterior lip with 2.
Drawings from type specimen (original):





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Opecoeloides vitellosus (Linton, 1900) Von Wicklen, 1946 (FIGURE 86)

Synonyms:
Distomum vitellosum Linton, 1900.
Cymbephallus vitellosus (Linton) Linton, 1934.
Anisoporus manteri Hunninen and Cable, 1940.
Host: *Mulloidichthys martinicus*.
Site: intestine.
Locality: Puerto Real, P. R.
Deposited specimen: No. 39361.

from Siddiqi & Cable, 1960

Opecoeloides vitellosus (Linton, 1900)
Von Wicklen, 1946

Synonyms: Distomum vitellosum Linton, 1900; *Anisoporus manteri* Hunninen & Cable, 1940; *Opecoeloides manteri* (Hunninen & Cable) Hunninen & Cable, 1941; **Cymbephallus vitellosus* (Linton) Linton, 1934.

Host: **Epinephelus adscensionis* (J).
Site: intestine. Jamaica

Von Wicklen (1946) pointed out that Linton had identified as *Distomum vitellosum* more than one species and that *Opecoeloides vitellosus* should be restricted to trematodes that agree with the descriptions given originally by Linton (1900) and later by Hunninen and Cable (1941).

FROM NAHHAS AND CABLE (1964)

Opecoeloides (?) sp. (FIGURE 91)

Description based on 1 immature and 2 mature specimens with characters of the genus. Body 0.665 to 0.735 long, 0.133 to 0.147 wide. Cuticle aspinose, eye-spot pigment absent. Oral sucker 0.061 to 0.079 in diameter. Ventral sucker pedunculate, 0.065 to 0.112 in diameter, with 3 anterior and 2 posterior papillae. Accessory sucker a short distance posterior to pharynx, without a limiting membrane. Sucker ratio 1:1.3. Prepharynx short, pharynx 0.052 to 0.067 in diameter, esophagus longer than pharynx, intestinal bifurcation at level of ventral sucker; ceca simple, extending almost to posterior end of body; their connection with excretory vesicle could not be detected in either living or fixed specimens. Separate ani absent. Genital pore to left of median line, at posterior margin of pharynx. Cirrus sac absent; seminal vesicle long, tubular; prostatic complex not well developed. Testes 2, 0.060 by 0.075, entire, median, within posterior third of body. Ovary entire, 0.039 to 0.042 in diameter, to right, anterolateral to anterior testis. Seminal receptacle absent. Vitelline follicles scattered along ceca from base of seminal vesicle to posterior end of body, not confluent in posttesticular space. Uterus preovarian; metraterm muscular. Eggs few, 0.063 by 0.023. Excretory vesicle sac-shaped.

Host: *Centropomus ensiferus*.

Site: intestine.

Locality: Guanajibo, P. R.

Deposited specimen: No. 39365.

The generic status of this species is questionable because of inability to establish the presence or absence of a uroproct. If such is present, the trematode is a species of *Opecoeloides*; if not, which seems likely, it resembles members of the genus *Genitocotyle*, in which, however, the ventral sucker lacks the characteristics of the present species and of those definitely assigned to the genus *Opecoeloides*.

from Siddiqi and Cable, 1960

Opecoeloides sp. (FIGURE 89)

Description based on a single specimen with characters of the genus. Body 1.141 long, 0.316 wide. Cuticle aspinose, eye-spot pigment absent. Oral sucker subterminal, 0.112 by 0.151. Ventral sucker 0.191 by 0.178, with 3 anterior and 2 posterior papillae. Accessory sucker 0.093 in diameter, with a limiting membrane. Sucker ratio 1:1.4. Prepharynx short, pharynx 0.099 by 0.145, esophagus longer than pharynx, intestinal bifurcation at level of ventral sucker, ceca simple, expanded, joining excretory vesicle to form a wide uroproct in posterior region of body. Genital pore about midway between oral and accessory suckers. Cirrus sac absent; seminal vesicle long, tubular, extending well posterior to ventral sucker; prostatic complex weakly developed. Testes 2, 0.099 to 0.105 by 0.125 to 0.132, smooth, tandem, contiguous, almost in posterior third of body. Ovary 0.059 in diameter, smooth, pretesticular, contiguous with anterior testis. Seminal receptacle absent. Vitelline follicles scattered from slightly anterior to level of ovary to posterior end of body, confluent posterior to testes. Uterus preovarian; metraterm simple. Eggs few, collapsed, 0.054 to 0.056 by 0.028 to 0.030. Excretory vesicle sac-shaped, extending to anterior margin of ovary; excretory pore terminal.

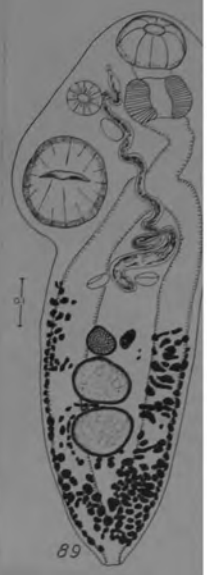
Host: *Trichurus lepturus*.

Site: intestine.

Locality: Joyuda, P. R.

Deposited specimen: No. 39363.

The above species agrees with Manter's (1940*a*) description of *O. eucinostomi*, except that the pharynx and eggs are slightly larger, the accessory sucker has a limiting membrane, and the seminal vesicle extends posterior to the ventral sucker. The species may be new, but judgment is withheld because only a single, excessively flattened mature specimen and 4 immature ones were available.



89

from Siddiqi and Cable, 1960

OPECOELOIDES