1990

Binder 125, Lepocreadiidae Ps-Z [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

Pseudocreadium Layman, 1930

Syn. *Leptocreadium* Ozaki, 1936

Generic diagnosis. — Allocreadiidae, Lepocreadiinae: Body flattened oval, pyriform or elliptical, sometimes round, spined, usually with somewhat frilled edges incurved ventrally. Oral sucker subterminal, followed by short prepharynx. Pharynx comparatively large, esophagus short; ceca arcuate, terminating close together at posterior extremity. Acetabulum comparatively small, toward center of body. Testes symmetrical or diagonal, in posterior half of body. Vesicula seminalis externa present. Cirrus pouch in front of acetabulum with its posterior end overlapping the sucker or not, containing vesicula seminalis, well differentiated prostatic complex and protrusible cirrus. Genital pore a little to the left, near intestinal bifurcation. Ovary submedian or median, pretesticular. Receptaculum seminis and Laurer's canal present. Uterus winding between ovary and acetabulum or between either testis and acetabulum, never reaching to posterior extremity; metraterm well differentiated. Vitellaria profusely developed along ceca, leaving peripheral area free or not, extending forward as far as esophagus, pharynx or oral sucker.

Excretory vesicle tubular, curved, intruding into forebody, with dorsal, rarely terminal, pore. Parasitic in intestine of marine fishes.

Genotype: *P. monacanthi* Layman, 1930, syn. *Leptocreadium skrjabini* Ozaki, 1936 (Pl. 9, Fig. 111), in *Cantherines modestus;* Peter the Great Bay. Also in *Cantherines unicornu*, Pacific coast of Japan; *C. scaber*, New Zealand.

Other species:

P. galapagoense Manter, 1946 (*P. scaphosomum* Manter, 1940, in part, in *Balistes verres;* Galapagos Island.

P. lamelliforme (Linton, 1907) Manter, 1946, in *Balistes;* Bermuda.

P. ovale Yamaguti, 1942 (Pl. 13, Fig. 167), in *Caesio chrysozonus* and *Pterocaesio tile;* Naha, Okinawa.

P. sohali Nagaty, 1942, in *Acanthurus sohal;* Red Sea. Manter (1946) referred this species to *Lepocreadium*.

P. vitellosum (Ozaki, 1936), syn. *Leptocreadium* v. O., in *Goniistius zonatus;* Simonoseki, Japan.

SPECIES OF *Pseudocreadium*

The following eight species have been named in the genus *Pseudocreadium: P. monocanthi* Layman, 1930 (synonym: *Leptocreadium skrjabini* Ozaki, 1936—pointed out by Yamaguti, 1938); *P. vitellosum* (Ozaki, 1936) Yamaguti, 1938; *P. symmetrorchis* (Ozaki, 1936) Manter, 1940; *P. patellare* (Yamaguti, 1938) Manter, 1940; *P. scaphosomum* Manter, 1940; *P. spinosum* Manter, 1940; *P. sohali* Nagaty, 1942; *P. balistes* Nagaty, 1942; *P. elongatum* Nagaty, 1942; *P. lamelliforme* (Linton, 1907). Certain of these species, notably *P. elongatum* and *P. vitellosum,* are so similar to *Lepocreadium* that generic distinction between *Lepocreadium* and *Pseudocreadium* becomes questionable. Although the type species of *Lepocreadium, L. album,* has tandem testes and unlobed ovary, the genus, probably correctly, now includes species with diagonal testes and with lobed ovary, and some with ovoid as well as elongated bodies. Probably the best character to separate the genera is the symmetrical position of the testes in *Pseudocreadium.* In the type species, *P. monocanthi,* the multilobed ovary is directly anterior to one testis, in all other species with symmetrical testes the ovary is more or less intertesticular. It is suggested that species with diagonal testes be transferred to *Lepocreadium,* becoming *Lepocreadium vitellosum* (Ozaki, 1936), n. comb.; *L. sohali* (Nagaty, 1942), n. comb.; and *L. elongatum* (Nagaty, 1942), n. comb. Most species of *Lepocreadium* possess a terminal or subterminal excretory pore, while in *Pseudocreadium* the pore is dorsal, conspicuous, and relatively far forward. *L. vitellosum,* however, has the *Pseudocreadium* type of pore. The two genera approach each other so closely that separation must, at present, be more or less arbitrary.

Manter (1940) considered *Hypocreadium* Ozaki, 1936, a synonym of *Pseudocreadium,* pointing out individual variability of spination, lobation of ovary, and posterior extent of uterus. This view is still held, although a possible distinction could be the preovarian seminal receptacle and the intertesticular ovary in *Hypocreadium.*

The excretory vesicle in *Pseudocreadium,* as in *Dermadena,* usually appears to be Y-shaped due to the inflation of the lateral tubes. Sections of *P. scaphosomum* show that, in that species at least, the lateral vessels open into the vesicle slightly posterior to its anterior end.

From Manter, 1946

Allocreadiidae

Leptocreadium ~~n. g.~~ OZAKI, 1936

Allocreadiidae with broad, flattened bodies. Cuticule smooth. Acetabular aperture equatorial or pre-equatorial. Oral sucker ventral near anterior margin, pharynx present, prepharynx and oesophagus short, caeca extending to near caudal margin. Genital pore close behind bifurcation, to the left. Testes symmetrical or diagonal, in the posterior end of the body. Cirrus pouch muscular, with vesicula seminis interna, coiled pars prostatica, and long cirrus. Prostate gland cells outside of cirrus pouch. Vesicula seminis externa present. Ovary lobed, postacetabular, pretesticular. Uterus pretesticular; eggs few. Receptaculum seminis and LAURER'S canal present. Vitelline follicles extensively developed, lateral or cover whole body. Excretory vesicle simple, unbranched, sac-like.

Type species—*Leptocreadium Skrjabini*.

Allocreadiidae

Pseudocreadium

Syn. Leptocreadium Ozaki, 1936

Allocreadiidae with broad, flattened bodies. Cuticule smooth. Acetabular aperture equatorial or pre-equatorial. Oral sucker ventral near anterior margin, pharynx present, prepharynx and oesophagus short, caeca extending to near caudal margin. Genital pore close behind bifurcation, to the left. Testes symmetrical or diagonal, in the posterior end of the body. Cirrus pouch muscular, with vesicula seminis interna, coiled pars prostatica, and long cirrus. Prostate gland cells outside of cirrus pouch. Vesicula seminis externa present. Ovary lobed, postacetabular, pretesticular. Uterus pretesticular; eggs few. Receptaculum seminis and Laurer's canal present. Vitelline follicles extensively developed, lateral or cover whole body. Excretory vesicle simple, unbranched, sac-like.

Type species: Leptocreadium skrjabini n. sp.

Yamaguti (1938) shows:

Pseudocreadium monacanthi Layman, 1930

Syn: Leptocreadium skrjabini Ozaki, 1936

PSEUDOCREADIUM Layman 1930

Body oval, sometimes entirely round. Skin covered with spines. On the ventral side, the entire surface of the body is deepened so that the animal can suck on with its entire ventral surface. The genital pore lies in the region of the intestinal bifurcation, behind it and to the left. Seminal vesicle is double (externa and interna). Ovary grape-like. Testes smooth. Uterus with few coils between the testes and ventral sucker. (pretesticular)

Type and only species: Pseudocreadium monocanthi Layman 1930

Pseudocreadium monocanthi* Layman 1930

Length 1.47 -2.45 mm; width 1.14-1.90 mm.
The oral sucker often larger than ventral sucker, or of same size (in one specimen even smaller). Length of oral sucker 245-409 µ, width 245-278 µ. Ventral sucker round, diameter 229-409 µ/

The testes lie in the posterior part of the body, elongate oval, located near one another at about the same level. Ovary grape-like, anterior to the left testis.
Length of testes 245-409 µ width 213-409 µ.
Diameter of the ovary 131-163 µ/
Cirrus sac in front of ventral sucker, 245-327 u long.
Seminal vesicle double (externa and interna).
Cirrus unarmed.
Uterus with few coils
Eggs 62-67 by 35-40 µ.
Vitellaria begin at the level of the pharynx and extend to the hind end of body.
Digestive system consists of pre-pharynx of 10-32 µ length.....???? 229-327 wide, esophagus of 81-98 µ long, ceca extending to hind end of body.

Host: intestine, Cantherinus modestus (Gunther)
Frequency: In 7 fishes, of 7 examined.
Location: Peter the Great Bay
Recorded from Monacanthus cirrhifer Temm & Schl and Cantherines unicornu from Inland Sea & Pacific by Yamaguti, 1934 (see over)

* typographical error in Layman

From Yamaguti (1934): Body oval, 1.64 to 3.35 by 1.14 to 2.31. Ventral surface concave, body flattened. Small spines in skin, embedded in cuticle. Oral sucker 0.2 to 0.4 by 0.22 to 0.44. Ventral sucker near midbody, 0.23 to 0.5.

Cirrus armed with spines, protrusible.

Ovary divided into numerous small roundish follicles.

Seminal receptacle round. Laurer's canal present.

Uterus passes backward between testes as far as posterior end of testes. Metraterm present. Eggs 60 to 80 by 37 to 44.

Excretory system Y-shaped. The two lateral branches cross the intestine ventrally.

incorrect Yam. (1938 : p. 34) state
This is Hypocreadium symmetrorchis

15. **Pseudocreadium monacanthi** Layman, 1930

SYNONYM: *Leptocreadium skrjabini* Ozaki, 1936

HOST: *Cantherines scaber* (Bloch & Schm.); leather jacket; intestine.

LOCALITY: Wellington.

SPECIMEN DEPOSITED: U.S. Nat. Mus. Helminth. Collection No. 49157.

DISCUSSION: Three specimens, one barely mature, were collected. They agree with *P. monacanthi* in almost all details. They are smaller (0·778 to 0·969 mm. compared with 1·47 to 2·45 mm.) but are probably younger. Eggs were 60 to 76 by 30 to 57μ, compared with 50 to 67 by 30 to 40μ, but only uncollapsed eggs were more than 38μ wide. The only difference I can detect, other than size, is that the ovary appears to be segmented into two or three masses each of which tends to be irregularly lobed. However, *P. monacanthi* has a "grape-like ovary" or one "divided into lobules." Figures by both Layman (1930) and Ozaki (1936) show these lobules connected or at least in contact. Such a condition might develop with age.

It is of interest to note that *P. monacanthi* is previously known from *Monacanthus cirrhifer*, *Cantherines modestus*, and *C. unicornu* from the South Pacific.

1938

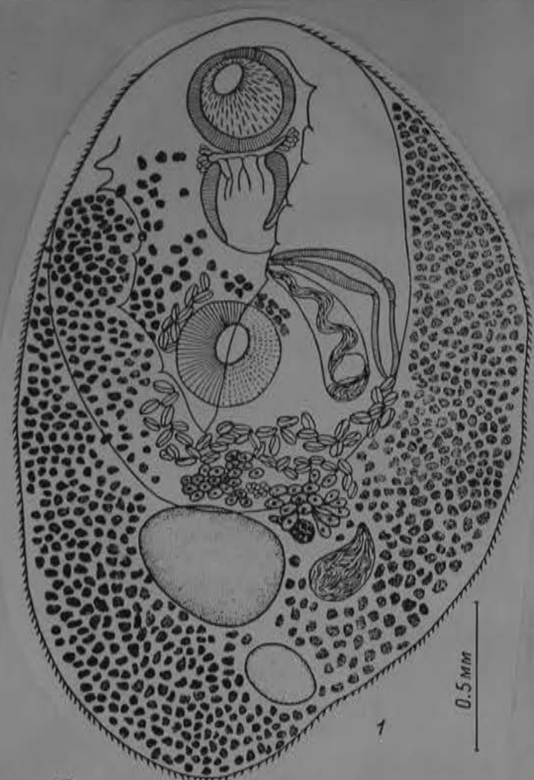
27. *Pseudocreadium monacanthi* Layman, 1930

Syn. *Leptocreadium Skrjabini* Ozaki, 1936

In my previous description of this species I included in it another entirely different species, which has recently been described by Ozaki under the name *Hypocreadium symmetrorchis*. The measurements given therein are to be substituted for the following made on two whole mounts from *Cantherines unicornu* (Basilewsky).

Body 1.6-1.67×1.1-1.25 mm; oral sucker 0.188-0.225×0.21-0.25 mm, pharynx 0.16×0.18-0.225 mm, acetabulum 0.225-0.25 mm in diameter; testes 0.25-0.35×0.188-0.26 mm; ovary 0.225-0.25×0.11-0.125 mm; eggs 60-75×35-45 μ.

Leptocreadium Skrjabini Ozaki, 1936, is a synonym of the present species, because it agrees completely with the latter. According to Ozaki the eggs are 50-61 μ long by 30-40 μ broad, but in the specimens which Ozaki kindly sent me for comparison, they are 60-72 μ long by 35-45 μ. As described by Ozaki the prostatic cells lie outside the cirrus pouch, and the excretory vesicle is tubular and gives off a collecting vessel on each side near its anterior end. The uterus does not extend into the intertesticular field. The cirrus and the ductus ejaculatorius are not armed with papilliform spines as observed in *Hypocreadium symmetrorchis*.



Pseudocreadium monacanthi Layman, 1930
Ex. *Gastrophysus lunaris*
INDIA
Ref. ZHUKOV, 19 [illegible]

Allocreadiidae

Pseudocreadium monacanthi Layman, 1930

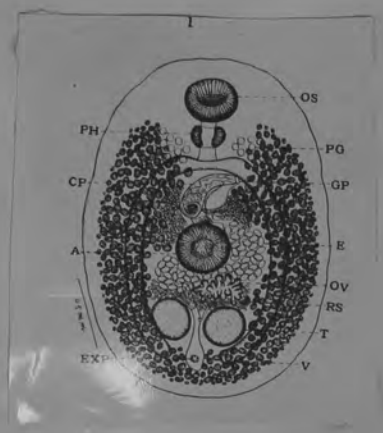
Syn. Leptocreadium skrjabini Ozaki, 1936

Body 1.5--2.2mm long by 1--1.6mm in maximum breadth. Cuticula smooth, without spines. Oral sucker near the anterior end 0.25-0.32mm in diameter; acetabulum as large as oral sucker, in the center of body. Pharynx 0.12-0.15mm by 0.18--0.25mm; prepharynx and oesophagus very short; caeca extend to near caudal end. Genital pore submedian, close behind bifurcation. Testes globular or ovoid about 0.2-0.3mm in diameter, symmetrically in the posterior end of body; posttesticular space one-eighth of body length. Cirrus pouch conical extending to the anterior border of the acetabulum; a small vesicula seminis externa behind the pouch.

Ovary elongated in transverse direction, divided into lobules, directly in front of left testis. Receptaculum seminis on the left side between ovary and left testis. Ootype median; Mehlis' gland diffuse type, in front of testes. Uterus intercaecal, between the testes and genital pore. Egg light brown, 0.05-0.061 x 0.03-0.04mm, with knob-like projection at antiopercular pole. Vitelline follicules lateral, extending from the pharyngeal level to the posterior end, coalesce behind the testes.

Excretory vesicle simple, tubular, extending anteriorly to near acetabulum. Pore dorsal, a little apart from the posterior margin.

Habitat: Intestine of marine fish Cantherines modestus (Gunther)



Paracreadium mercantile Layman, 1930

Leptocreadium Skrjabini n. sp. OZAKI, 1936

Body 1.5–2.2 mm long by 1–1.6 mm in maximum breadth. Cuticula smooth, without spines. Oral sucker near the anterior end 0.25–0.32 mm in diameter; acetabulum as large as oral sucker, in the center of body. Pharynx 0.12–0.15 mm by 0.18–0.25 mm; prepharynx and oesophagus very short; caeca extend to near caudal end. Genital pore submedian, close behind bifurcation. Testes globular or ovoid about 0.2–0.3 mm in diameter, symmetrically in the posterior end of body; posttesticular space one-eighth of body length. Cirrus pouch conical, extending to the anterior border of the acetabulum; a small vesicula seminis externa behind the pouch.

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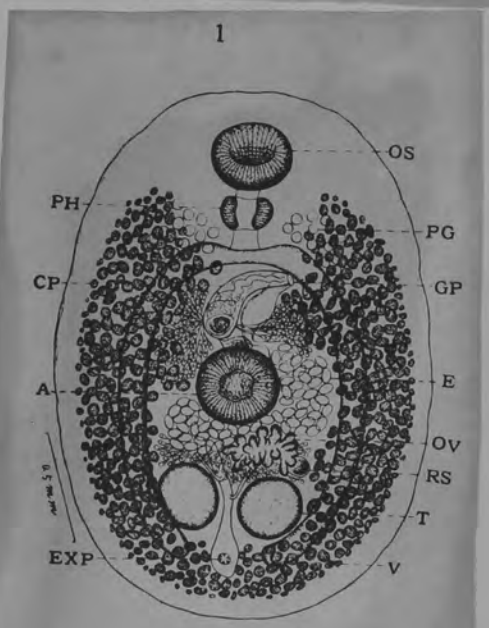
Excretory vesicle simple, tubular, extending anteriorly to near acetabulum. Pore dorsal, a little apart from the posterior margin.

Habitat—Intestine of marine fish *Cantherines modestus* (GÜNTHER).

1



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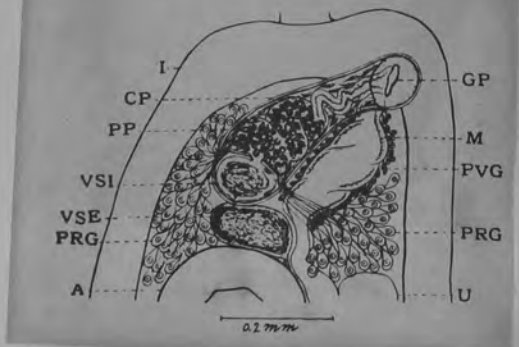


Pseudocreadium **biminensis**, sp. nov.[3]

Sogandares-Bernal, 1959

Host.—*Balistes capriscus* Gmelin, ocean tally.

[3] The name *biminensis* indicates the type locality.

Location.—1/3 intestine in one host and 1/3 intestine (mature specimen) and 2/3 intestine (immature specimen).

Locality.—W. side of N. Bimini and near Cat Cay, B.W.I.

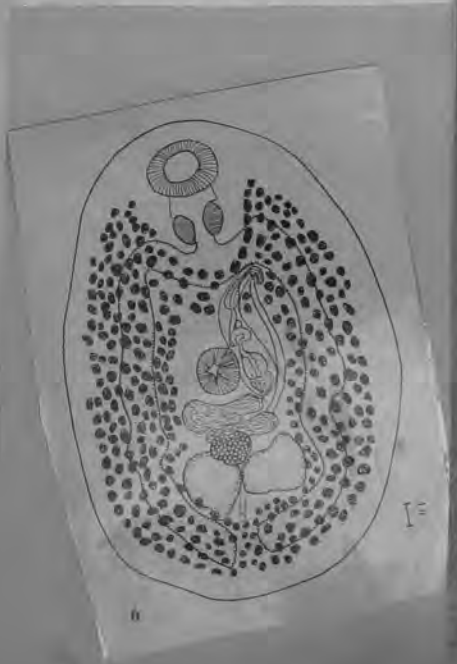
Holotype.—U.S.N.M. Helm. Coll. No. 38861.

Diagnosis (based on 2 mature specimens).—Body elongate elliptical, spined; 1.577 to 2.294 long by 1.007 to 1.596 wide. Forebody 0.779 to 1.003 long. Posterior body 0.608 to 1.007 long. Oral sucker simple, subterminal, 0.208 to 0.281 long by 0.241 to 0.348 wide. Acetabulum equatorial, 0.208 to 0.255 long by 0.174 to 0.214 wide. Sucker ratio 1:0.51 to 0.89. Prepharynx as wide as, and half length of, pharynx which measures 0.161 long by 0.181 to 0.255 wide. Esophagus approximately half length of pharynx. Cecal bifurcation in anterior 1/3 body. Ceca arch laterally on each side of body, completely encircling testes, ending a short distance from posterior end of body. Genital pore sinistral, almost reaching inner edge of left cecum midway between acetabulum and anterior end of body. Gonads postequatorial. Testes round to irregular, side by side, in the posterior 1/3 body; right testis 0.348 to 0.779 long by 0.295 wide; left testis 0.235 to 0.295 long by 0.201 to 0.318 wide. Cirrus sac extending from genital pore to slightly posterior to acetabulum, entirely to left of acetabulum, cirrus in anterior third of sac, followed by narrow coiled prostatic vesicle which tubular anteriorly and almost bulbular posteriorly; internal seminal vesicle spherical, in posterior 1/6 sac. External seminal vesicle voluminous, extending from cirrus sac transversally between ovary and acetabulum. Ovary indistinctly tri-lobed, median, in contact with right testis, 0.134 to 0.181 long by 0.147 to 0.181 wide. Seminal receptacle club-shapde, between left testis and posterior tip of cirrus sac in one specimen and transverse, near midbody, immediately posterior to external seminal vesicle in another. Vitellaria extending from level of posterior edge of oral sucker on each side of body, confluent medianly at level of cecal bifurcation and genital pore, separating anterior to acetabulum and overlapping ceca on each side of body for their posterior extent to terminate a short distance from posterior end of body, confluent posterior to testes. Uterus anterior to ovary, entering muscular metraterm to left of and slightly longer than cirrus sac. Eggs 64 to 72 by 32 to 36 microns. Excretory pore dorsal, median, between inner aspect of tips of ceca and testes. Excretory vesicle partly visible in immature specimen; tubular, extending to mid-testicular level where two cornua branch off, one on each side of body; giving vesicle a Y-shaped appearance; they are not visible anterior to seminal receptacle.

Discussion.—Layman (1930) named the genus *Pseudocreadium* for *Pseudocreadium monacanthi*. Ozaki (1936) named the genera *Leptocreadium* and *Hypocreadium*. *Leptocreadium* Ozaki, 1936 *proparte* and *Hypocreadium* Ozaki, 1936 were considered synonyms of *Pseudocreadium* Layman, 1930 by Manter (1940a, 1945). Yamaguti (1953) considered *Hypocreadium* distinct from *Pseudocreadium* on the basis that the ovary is between the testes in the former genus and in advance of the testes in the latter genus. Bravo and Manter (1957) accepted Yamaguti's (1953) two genera on the basis of intertesticular ovarian position and posterior extent of the uterus. Examination of paratypes of Panamanian *Pseudocreadium scaphosomum* Manter, 1940, reveals variation in intertesticular ovarian position (figs. 7, 8). Furthermore, if a series of the species *P. scaphosomum* Manter, 1940, *P. spinosum* Manter, 1940, *P. galapagoense* Manter, 1945 and *P. monacanthi* Layman, 1930 are studied, they will clearly show intergradation from intertesticular to pretesticular ovarian position. Extent of uterus posterior to ovary is also not constant. A study of a large series of *P. scaphosomum* showed the uterus extending from mid-ovary to posterior to ovary, to posterior level of testes and slightly beyond. This observed variation did not appear to be correlated with size of individual specimens. For this reason, the genus *Hypocreadium* is considered a synonym of *Pseudocreadium*.

Manter (1945) transferred four species of *Pseudocreadium* to *Lepocreadium*. These were: *P. balistes* Nagaty, 1942, *P. elongatum* Nagaty, 1942, *P. sohali* Nagaty, 1942, and *P. vitellosum* (Ozaki, 1936) Manter, 1940 (syn: *Leptocreadium vitellosum* Ozaki, 1936). Other species in the genus *Pseudocreadium* are: *P. anandrum* Manter, 1947 (syn: *H. anandrum* (Manter, 1947) Yamaguti, 1953); *P. dampieriae* (Yamaguti, 1942) n. comb., (syn: *H. dampieriae* Yamaguti, 1942); *P. galapagoensis* Manter, 1945; *P. lamelliforme* (Linton, 1907) Manter, 1945, (syn: *Distomum lamelliforme* Linton, 1907 *pro parte*); *P. monacanthi* Layman, 1930, (syn: *Leptocreadium skarjabini* Ozaki, 1936); *P. ovale* Yamaguti, 1942; *P. patellare* (Yamaguti, 1938) Manter, 1940, (syn: *H. patellare* Yamaguti, 1942); *P. scaphosomum* Manter, 1940; (syn: *H. scaphosomum* (Manter, 1940) Yamaguti, 1942; *H. myohelicatum* Bravo & Manter, 1947, new synonymy); *P. spinosum* Manter, 1940, (syn: *H. spinosum* (Manter, 1940) Yamaguti, 1942); *P. symmetrorchis* (Ozaki, 1936) Manter, 1940, (syn: *H. symmetrorchis* Ozaki, 1936).

Pseudocreadium biminensis is most closely related to *P. galapagoensis*. Both differ from all other species of *Pseudocreadium* by having the metraterm and cirrus sac on the left side of the acetabulum. *P. biminensis* differs from *P. galapagoensis* by having vitellaria which extend only to posterior edge of oral sucker as compared with vitellaria extending anteriorly as far as anterior border of oral sucker; sucker ratio of from 1:0.51 to 0.89 as compared with sucker ratio 1:1 to 1.13; transverse, median external seminal vesicle as compared with a lateral diagonal external seminal vesicle; cirrus sac extending posteriorly beyond acetabulum as compared with cirrus sac extending to mid-acetabulum or slightly beyond, median position of acetabulum as compared with acetabulum more anterior to equator, and locality Atlantic rather than Pacific Ocean.



64. *Pseudocreadium exiguum*
(Manter, 1963) ~~n. comb~~. YAMAGUTI, 1970
Syn. *Lepocreadium exiguum* Manter, 1963
(Fig. 78)

HABITAT: Intestine of *Balistes capistratus*; Hawaii.

DESCRIPTION (based on four whole mounts): Body discoid, 1.05-1.5 × 0.8-1.8 mm, with thin smooth cuticle. Oral sucker ventral, 0.13-0.23 × 0.18-0.29 mm; prepharynx wide; pharynx 0.11-0.18 × 0.15-0.24 mm; esophagus very short or practically absent; ceca arcuate, well apart from lateral edges of body, terminating blindly at level of posterior end of posterior testis. Acetabulum 0.14-0.21 × 0.15-0.22 mm, just postequatorial.

Testes contiguous, tandem or diagonal, 0.1-0.24 × 0.15-0.27 mm, intercecal, close to posterior extremity. Vesicula seminalis externa 30-44 μ wide, overlapping acetabulum, with cellular lining. Cirrus pouch claviform, 0.23-0.37 × 0.08-0.14 mm. Vesicula seminalis interna reduced to a calciform vesicle compressed between pars prostatica and cirrus pouch just as illustrated by Manter (Fig. 3). Pars prostatica elliptical, may be constricted into a smaller anterior and a larger posterior vesicle, 90-170 × 50-80 μ. Ejaculatory duct strongly muscular, winding. Genital pore a little to left, ventral or just medial to left cecum at level of intestinal bifurcation.

Ovary deeply and irregularly lobed just as figured by Manter, immediately pretesticular, with principal part to left of median line, posterolateral to acetabulum. Seminal receptacle reduced to a transversely elongated sac of irregular outline lying immediately posterodorsal to acetabulum. Laurer's canal arising from germiduct just at the point where the latter turns back on itself toward the ootype, opening dorsal to acetabulum a little anterior to seminal receptacle. Vitelline follicles profusely developed in submarginal area from level of oral sucker to posterior extremity. Uterus coiled in postacetabular dorsal area; metraterm well developed. Eggs oval, 58-63 × 32-39 μ in life. Excretory vesicle tubular, reaching beyond anterior border of acetabulum.

DISCUSSION: Although there is not complete agreement between Manter's description of this species and my specimens, especially in the anterior extent of the excretory vesicle and in egg size, I prefer to refer the Hawaiian species to Manter's, which is, however, transferred to *Pseudocreadium* because of greater resemblance to this genus than to *Lepocreadium*. As suggested by Manter, this species very closely resembles *P. vitellosum* (Ozaki, 1936), but differs from it in the structure of the internal seminal vesicle. The most outstanding feature of the present species is the fact that the external seminal vesicle is lined with epithelia (cf. Manter's figure 3). I hesitate to say that this charater constitutes a generic character.

PSEUDOCREADIUM EXIGUUM (MANTER, 1963) YAMAGUTI, 1970

SYN. *Lepocreadium exiguum* sp. n. Manter, 1963

(Figs. 1 to 3)

Host: Unidentified species of triggerfish; Balistidae.

Location: Intestine.

Holotype and paratype: No. 59845.

Description (based on four specimens; three from one host, one from another): Body flattened, broadly rounded at each end; almost as wide as long; 0.938 to 1.036 long by 0.622 to 0.728 wide. Cuticula thin, without spines (which may have been lost by maceration); numerous pigment granules in forebody. Suckers subequal; oral sucker ventral, 0.161 to 0.200 wide; acetabulum near midbody, 0.169 to 0.184 wide; sucker ratio 1:0.9 to 1.0; forebody 0.447 to 0.501. Prepharynx very short and wide; pharynx wider than long, with lobed anterior border, 0.100 to 0.115 long by 0.129 to 0.145 wide; esophagus wide and very short; ceca bowing outward, then backward, some distance from sides of body, ending blindly at posterior edge of posterior testis.

Genital pore to left, ventral or slightly lateral to left cecum, near level of bifurcation, about midway between suckers. Testes smooth, tandem, contiguous, wider than long, filling most of intercecal postacetabular space, anterior testis larger; posttesticular space 0.077 to 0.115. Cirrus sac (Fig. 2) claviform, 0.268 to 0.342 long by 0.080 to 0.084 greatest width; containing very minute (usually invisible in toto mounts) internal seminal vesicle (Fig. 3); large, elongate, saclike prostatic vesicle filled with large cells and bending back sharply to enter narrow pars prostatica; pars prostatica at first convoluted, then straight for about half length of cirrus sac, serving as ejaculatory duct of cirrus; cirrus protrusible; prostatic cells in middle third of cirrus sac. External seminal vesicle rudimentary, pyriform, invisible in toto mounts, measuring 32 by 17 μ in sectioned specimen (Fig. 3), with cellular wall.

Ovary immediately pretesticular; overlapping laterally anterior testis and acetabulum; deeply lobed; lobes like rounded branches with narrow stalks; lobes in two groups, one of four, one of three lobes; all lobes may be on left side of anterior testis (two specimens), or three may be on opposite side (two specimens); anteriormost lobes lateral to acetabulum. Vitelline follicles filling most of body, from level of middle of oral sucker to posterior end of body, covering most organs dorsally but not ventrally, confluent posterior to testes and dorsally over much of body. Uterus extending posteriorly to anterior edge of posterior testis; metraterm present; seminal receptacle inconspicuous, empty, not visible in one specimen; eggs thin-shelled, 64 to 68 by 37 to 49 μ.

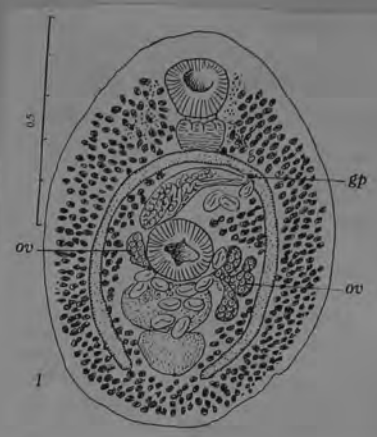
Excretory pore dorsal near posterior end of body; excretory vesicle wide and short, covering posterior testis dorsally.

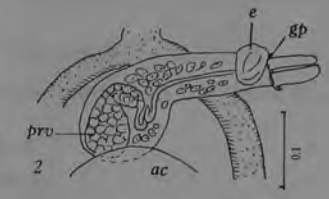
The name *exiguum*, scanty or meager, refers to the rudimentary seminal vesicles.

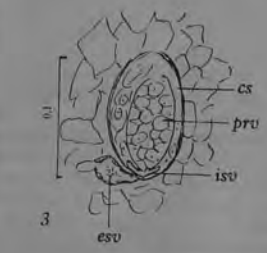
Discussion: Although body spines were not visible, they were probably lost by maceration. Other characteristics agree with the genus *Lepocreadium* Stoss., 1904. The seminal vesicles, however, were so small as to be invisible in toto mounts. Before serial sections were studied, this trematode was thought to represent a new genus related to *Lepocreadium vitellosum* (Ozaki, 1936) Manter, 1946. *L. vitellosum*, from *Goniistius zonatus* (Aplodactylidae) in Japan, is probably the nearest related species. Its seminal vesicles were described as "small." Most species of *Lepocreadium* have diagonal testes, but in *L. vitellosum* the testes are almost tandem. A multilobed ovary also occurs in *Pseudocreadium monacanthi* Layman, 1930, and the ovary may be fragmented (Manter, 1954), but the testes are symmetrical.

P. exiguum differs from *P. vitellosum* in the lobed anterior border of the pharynx, in the more tandem testes, in more posterior extent of the uterus, smaller seminal vesicles, and larger eggs. One specimen of *P. exiguum* did show a small but distinct internal seminal vesicle. In all four specimens the seminal receptacle was empty and no sperm cells were visible in the seminal vesicles except that in serial sections a few could be seen in the external seminal vesicle.

The genus *Pseudoparvumcreadium* Caballero, 1957, should be considered a synonym of *Lepocreadium*. Body spines had probably been lost. Its single species, *P. maris* Caballero, 1957, is much like *Lepocreadium trulla* (Linton, 1907), differing chiefly in less posterior extent of the cirrus sac.







Pseudocreadium galapagoensis n. sp.

In a restudy of the confusing individual variation of specimens of *P. scaphosomum*, it was discovered that the author's collection from *Balistes verres* from the Galapagos Islands contained two species rather than one. Of 13 specimens, 9 are small-sized *P. scaphosomum* as reported; the other 4 specimens are a new species. Five specimens collected from the same host, *B. verres*, from Isabel Island, Mexico, are all *P. scaphosomum*.

Pseudocreadium galapagoensis n. sp. Manter, 1946

(Fig. 9)

Description (based on 4 specimens): Body slightly longer than wide, edge slightly inrolled ventrally in posterior half; 0.825 to 1.107 mm long by 0.750 to 0.931 mm wide; smooth except for a few fine scales on edges of suckers; oral sucker 0.127 to 0.217 mm in transverse diameter; acetabulum 0.144 to 0.225 mm; sucker ratio 1:1 to 1.13. Prepharynx short; pharynx relatively large, 0.102 to 0.136 mm long by 0.090 to 0.136 mm wide; esophagus short; ceca bow anteriorly and outward, then extend almost straight back until they curve medianly posterior to the testes, with short lateral and median bulges in posterior half. Genital pore to the left, opposite or just median to left cecum, about halfway between suckers. Testes symmetrical, lobed, in posterior half of body. Cirrus sac extending from genital pore almost directly backward along left margin of acetabulum to midacetabular level or slightly beyond; containing a spherical seminal vesicle, prostatic vesicle with wide posterior and narrow, tubular, sinuous anterior, portions; and sinuous cirrus. External seminal vesicle small, tubular, sinuous. Ovary of irregular, variable shape; seminal receptacle large, elongated, directly to left of ovary or to the left and slightly anterior, not overlapping acetabulum; uterus preovarian, extending along the right side of the acetabulum to or slightly beyond anterior edge of the acetabulum, then across the body posterior to the acetabulum to join the metraterm to the left of the cirrus sac; metraterm as long as or slightly longer than the cirrus sac, its posterior tip narrowed, appendix-like. Vitelline follicles filling sides of body from oral sucker to posterior end, confluent dorsally between pharynx and acetabulum and posterior to testes, continuous across ceca dorsally but not ventrally. Eggs 60 to 65 by 33 to 34 μ. Excretory pore dorsal at level of posterior ends of testes; excretory vesicle traceable only to the ovary.

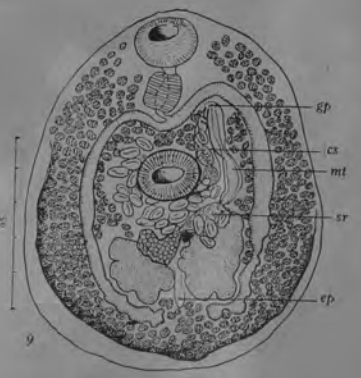
Host: Balistes verres (Gilbert and Starks).

Location: Intestine.

Locality: Charles Island, Galapagos.

Type specimen: U. S. Nat. Mus. Helminth. Coll., No. 36932.

Comparisons.—The most characteristic feature of this species is the fact that both cirrus sac and metraterm lie parallel and close together on the left side of the acetabulum. In all other species these two organs diverge from the genital pore toward opposite sides of the acetabulum. The anterior coil of the uterus on the right side of the acetabulum and the postacetabular seminal receptacle are other peculiar characters. The suckers are more nearly the same size and the pharynx is relatively larger than in other species. *P. galapagoensis* is like *P. spinosum* in the preacetabular continuity of the vitellaria.



-OVER-

Pseudocreadium galapagoensis Manter, 1946

Synonym: Pseudocreadium scaphosomum Manter, 1940 in part.

Host: **Balistes ringens* (C). CURAÇAO

Site: intestine.

Sogandares-Bernal (1959) described *Pseudocreadium biminensis* from 2 specimens and indicated a close resemblance to *P. galapagoensis*. For his species, he gave 5 distinguishing features which, except for the anterior extent of the vitellaria, are variable in our 17 specimens from Curaçao. Sucker ratios are intermediate, being 1:0.70-1.00 compared with 1:0.51-0.89 for *P. biminensis* and 1:1-1.13 for *P. galapagoensis;* the external seminal vesicle is usually median and transverse but lateral and diagonal in a few of our specimens. In the posterior extent of the cirrus sac, the Curaçao material is like *P. galapagoensis,* but in the position of the ventral sucker, it is like *P. biminensis.* In all 17 specimens, however, the vitellaria extend to the mid- or anterior level of the oral sucker and thus provide the only distinguishing feature between the 2 species. Dr. Manter examined one of our specimens and verified its identification. Minute spines which were observed on the cirrus in living material were not reported by Manter but were seen in a paratype provided by him. The excretory vesicle is pyriform, with its narrower anterior portion receiving 2 canals which extend slightly anterior to the ventral sucker and divide into anterior and posterior secondary tubules, each joined by 2 large groups of flame cells.

FROM NAHHAS AND CABLE (1964)

Pseudocreadium ghanensis ~~n.sp.~~ (Figs. 7, 8) Fischthal and Thomas, 1970

Description (*based on* 257 *worms*; 15 *adults measured*): Body elongate oval, sometimes constricted laterally at approximate level of posterior margin of acetabulum, 448–750 by 230–330; numerous unicellular glands in parenchyma between anterior extremity and testes, located ventrally between testes and posterior half of acetabulum and between latter and posterior third of oral sucker, laterally filling body depth, dorsally over most of oral sucker; tegument spined to approximate midlength of posttesticular space, spines shorter and fewer posteriorly; eye spot pigment granules scattered between pharynx and acetabulum. Forebody 124–170 long; hindbody 225–455 long; forebody-hindbody length ratio 1:1·8–2·9. Oral sucker subterminal ventral, lying short distance posterior to anterior extremity, slightly wider than long, 68–97 by 78–102; acetabulum transversely elongate, aperture transversely oval and directed anteroventrally, 97–137 by 111–170; sucker length ratio 1:1·31–1·53, width ratio 1:1·37–1·75. Prepharynx and oesophagus very short; pharynx 4-lobed anteriorly with ventral lobe shorter and dorsal longer than lateral ones, round to slightly transversely elongate, 35–48 by 37–51; caecal bifurcation usually overlapping anterior part of acetabulum but may be up to 24 preacetabular; caeca wide, cell lined, extending to near posterior extremity.

Testes 2, smooth, elongate oval, symmetrical, usually short distance postacetabular but may slightly overlap latter, lying ventral to caeca; right testis 94–177 by 82–111; left testis 97–172 by 83–133; posttesticular space 123–245 long. Vas efferens from each testis passing medianly, joining to form short vas deferens; latter sometimes tubular, sometimes inflated, entering external seminal vesicle; latter usually transversely oval, 43–68 by 52–90, commencing 18–45 postacetabular. Cirrus sac muscular, elongate oval, commencing dorsal to acetabulum, extending preacetabular, 80–160 by 53–73. Internal seminal vesicle usually transversely elongate, 22–50 by 38–49. Pars prostatica usually longitudinally elongate, saccular, with few lining cells, 27–58 by 26–43. Cirrus muscular, elongate, protrusible. Prostate cells surrounding anterior part of internal seminal vesicle, pars prostatica, and posterior part of cirrus. Genital atrium shallow. Genital pore anterosinistral to acetabulum, precaecal or ventral to left caecum at level of caecal bifurcation.

Ovary deeply 4–6 lobed, lobes usually separated and distinct, partly intertesticular and partly anterior to right or left testis, may overlap mesial parts of both testes, overall dimensions 90–145 by 87–180. Seminal receptacle intertesticular, dorsal to ovary, posterior to and usually contiguous with external seminal vesicle, 57–86 by 45–59. Vitelline follicles large, anteriormost extent at level of acetabulum, extending to posterior extremity, filling posttesticular space, confluent dorsomedianly to mid or anterior part of ovary and extending from this level anterolaterally dorsal to testes to lateral fields on either side of acetabulum, confluent ventromedianly to posterior part of ovary and testes, ventrolaterally may be interrupted at level of one or both testes. Vitelline reservoir large, dorsal to ovary, ventral to seminal receptacle. Uterus short, with few coils between ovary and posterior part of acetabulum, may overlap anterior part of testes. Metraterm long, thick walled, muscular, sinistral to cirrus sac, commencing dorsal to acetabulum, shorter than cirrus sac, extending slightly farther preacetabularly than latter, 64–138 by 12–33. Eggs few, 1–16 in number per worm, yellow to yellow-brown, operculate, 14 measuring 51–61 by 29–35.

-over-

Excretory bladder unbranched, tubular, cell lined, extending anteriorly to acetabular level, pore terminal.

Hosts : Type, *Drepane punctata* (L.), spadefish (Drepanidae) ; *Cynoscion macrognathus* (Bleeker), large-mouth weakfish (Sciaenidae).

Locations : Pyloric caeca, duodenum.

Locality : Cape Coast, Ghana.

Dates : 3, 13 December 1965, 17, 21 February, 2, 21 March 1966 (*D. punctata*) ; 16 December 1965 (*C. macrognathus*).

Specimens : USNM Helm. Coll. No. 70773, 70774 (holotype and paratypes from *D. punctata*) ; No. 70775 (paratype, *C. macrognathus*).

Discussion : Thirteen of 15 *D. punctata* examined were infected with 7 (in 3), 8 (in 2), 9 (in 2), 15 (in 2), 23, 38, 51, and 58 worms, respectively ; 1 of 10 *C. macrognathus* harbored a single worm. In most of our specimens tegumental spines were missing or a few patches only were present. Apparently, this species and probably others in the genus *Pseudocreadium* Layman, 1930 (syn. *Hypocreadium* Ozaki, 1936) macerate very quickly after death of their hosts and lose a part or all of the tegumental spines. Such a related condition was noted by Manter (1940) for his new species *P. scaphosomum* and was commented upon by Skrjabin and Koval (1960). In the keys given by Sogandares and Hutton (1959) and Skrjabin and Koval (1960) our form keyed to the genus *Pseudocreadium* ; in Yamaguti's (1958) keys it keyed to a choice between *Pseudocreadium* and *Hypocreadium*. Our new species differs from all known species of *Pseudocreadium* in having the vitellaria commencing at the acetabular level rather than preacetabularly, and in the caeca lying dorsal to the testes rather than lateral to them. Our form appears closest to *P. dampieriae* (Yamaguti, 1942) from a pseudochromid fish from Japan, the latter species differing further in having a longer forebody and oesophagus, the cirrus sac commencing preacetabular, the external seminal vesicle twisted and long, and the genital pore more anteriorly situated.

Pseudocreadium indicum ~~sp. nr.~~
(Fig. 7) Madhavi, 1972

Host: *Monacanthus choirocephalus* (Bleeker) (Monacanthidae).

Location: Intestine.

Number: 33 mature and 6 immature from 3 hosts.

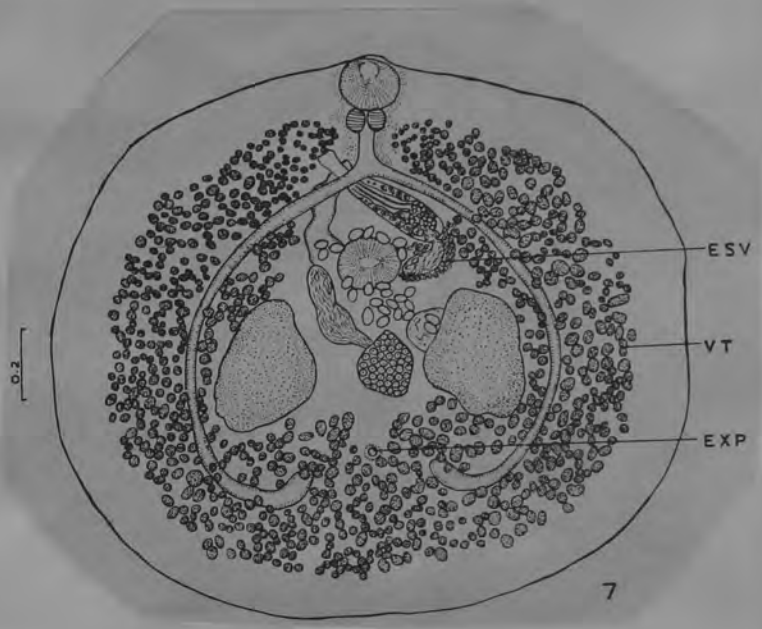
Holotype: USNM Helm. Coll. No. 72232.

Description (measurements on 10 specimens): Body greatly flattened, broader than long, appearing as a disc sometimes with folded lateral edges; length 992 to 1,504; width 1,200 to 1,600, spines probably lost; forebody 320 to 484 with scattered granules of eyespot pigment. Oral sucker 128 to 156 in diameter; acetabulum 140 to 163 in diameter, in anterior third of body; sucker ratio 1:1.1 to 1.2. Prepharynx absent; pharynx 71 to 140 long by 78 to 117 wide; esophagus as long as pharynx; ceca arcuate with inwardly turned posterior ends, terminating about halfway between ovary and posterior end of body.

Testes elongate, symmetrical, intercecal, at midbody, with smooth or irregular margins, 240 to 336 long and 208 to 272 wide. Genital pore immediately left of posterior end of esophagus. Cirrus sac 288 to 400 long and 80 to 96 wide, lying obliquely along median side of right cecum to level of midacetabulum, never touching acetabulum. Internal seminal vesicle small, prostatic vesicle sinuous, cirrus long and sinuous; external seminal vesicle dextral to acetabulum.

Ovary compact or slightly lobed, 112 to 160 long by 129 to 400 wide, intertesticular, separated from acetabulum by uterus; seminal receptacle long, extending to left of acetabulum; Mehlis' gland between ovary and right testis. Vitellaria extending from level of pharynx along each cecum, confluent in posttesticular space, situated both lateral and median to ceca but absent along edges of body. Uterus preovarian, emerging anterior to acetabulum as a thick-walled metraterm about half as large as cirrus sac. Eggs large, oval, 62 to 66 long and 35 to 39 wide. Excretory bladder I-shaped, anterior extent not known.

Waltair Coast, Bay of Bengal



Remarks

This species is most similar to *P. patellare* (Yamaguti, 1938), differing from it only in the extent of the uterus which does not go posterior to the testes in *P. indicum*. This character is constant for all the 33 specimens of *P. indicum* examined here. If further collections prove that the uterus extends posterior to the testes in *P. indicum* the species will fall a synonym of *P. patellare*.

Of the species having entirely pretesticular uterus, *P. indicum* resembles *P. spinosum* Manter, 1940, and *P. lactophrysi* Nahhas and Cable, 1964, in the shape of body and arrangement of gonads, but it differs from *P. lactophrysi* in the location of the ovary away from the acetabulum and vitellaria not confluent anteriorly and from *P. spinosum* further in the sucker ratio and vitellaria being confluent posteriorly.

Lepocreadiidae

Pseudocreadium **lactophrysi** n.sp.
Nahhas & Cable, 1964
Figures 25 and 26

Synonym: Pseudocreadium sp. Siddiqi & Cable, 1960.

Hosts: Lactophrys tricornis (C); *L. trigonus* (C); *L. triqueter* (C, J).

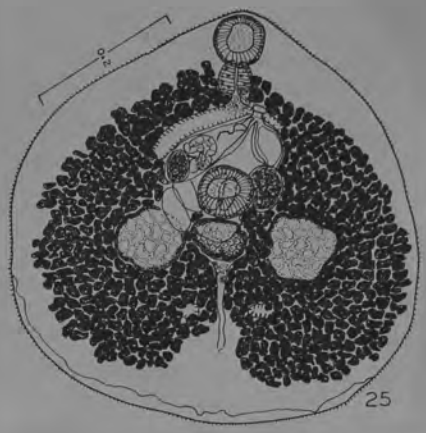
Site: intestine.

Holotype: U.S.N.M. 60273.

Description based on 25 mature specimens. Body broadly pyriform to almost circular, 0.333-0.667 long, 0.280-0.710 wide. Entire cuticle spinose; spines partially lost in some specimens; eye-spot pigment present. Oral sucker subterminal, 0.033-0.078 long, 0.053-0.083 wide; ventral sucker subequatorial, 0.056-0.102 in diameter; sucker ratio 1:1.0-1.3. Prepharynx absent; pharynx 0.033-0.068 in diameter; esophagus about same length as pharynx; ceca arching to enclose reproductive system, ending about midway between testes and posterior end of body. Testes symmetrical, irregular, 0.083-0.165 in diameter; cirrus sac to right, not extending posterior to midlevel of ventral sucker, containing large internal seminal vesicle, bipartite pars prostatica and relatively long cirrus. External seminal vesicle an elongated sac overlapping cirrus sac posterodorsally. Ovary irregular to trilobed, 0.045-0.090 long, 0.060-0.120 wide, immediately posterior to ventral sucker, median or rarely submedian; seminal receptacle large, ovoid, to left of ventral sucker; uterus short, not extending posterior to ovary; metraterm about half length of cirrus sac. Vitelline follicles numerous, extending from level of oral sucker to posterior end of body, confluent dorsally at intestinal bifurcation and posterior to ovary. Eggs few, 58-68 by 33-45 μ. Genital pore to left of midline, at level of, or immediately posterior to intestinal bifurcation. Excretory vesicle tubular, extending to posterior edge of ovary; excretory pore dorsal, far removed from posterior end of body. Siddiqi and Cable (1960) reported the flame cell formula for their immature specimen to be 2[(2+2+2) + (2+2)].

Manter (1945) pointed out that Linton (1907) confused 2 species as *Distomum lamelliforme*. Linton's Figure 75 probably is *P. lactophrysi;* thus 3 rather than 2 species may have been misinterpreted as a single one by Linton.

The broadly pyriform body in combination with a uterus that does not extend posterior to the ovary distinguish *Pseudocreadium lactophrysi* from all species of *Pseudocreadium* except *P. spinosum* Manter, 1940. A comparison of the present material with Manter's description and 3 specimens of *P. spinosum* reveals the following: *P. lactophrysi* is a smaller species but its measurements overlap those of *P. spinosum;* the anterior end is somewhat pointed rather than truncated; a prepharynx is absent; the testes are more anterior and the seminal receptacle is ovoid rather than tubular.



PSEUDOCREADIUM LACTOPHRYSI NAHHAS AND CABLE, 1964

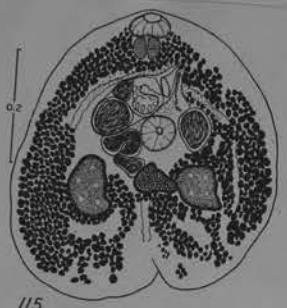
SYN:

Pseudocreadium sp. (FIGURES 115 and 116)

Host: *Lactophrys tricornis*.
Site: intestine.
Locality: off Puerto Real, P. R.

This species is not described or identified because only a single specimen without eggs was found. It may be *P. scaphosomum* Manter, 1940. The excretory vesicle is much as in *Dermadena*, but the flame cell pattern is simpler, its formula being 2[(2 + 2 + 2) + (2 + 2)].

from Siddiqi & Cable, 1960



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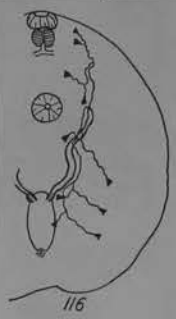


116

Pseudocreadium ovale Yamaguti,1942

Body pyriform, 0.55 to 0.86 by 0.32 to 0.45 mm.
Eyespots scattered in cervical region.
Minute spines
Oral sucker 0.050 to 0.087 wide
Acetabulum 0.060 to 0.090 wide ; just anterior to midbody
Sucker ratio:
Prepharynx up to 45 u long; esophagus 50 to 80 u long
Testes oval side by side between ceca near posterior end.
External sem.ves. rounded, postero-dorsal or dorsal to acetabulum.
Cirrus sac subcylindrical to claviform, in postbifurcal field overlapping acetabulum at its posterior end.
Cirrus protrusible, stout, smooth.
Genital pore slightly to left of median line behind intestinal bifurcation.
Ovary smooth, oval, immediately in front of right testis.
Seminal receptacle pyriform, posterodorsal to ovary.
Uterus between bifur cation and left testis.
Metraterm turns backward to join genital pore.
Eggs 54 to 69 by 36 to 39 u.
Vitellaria large, surrounding ceca along entire length.
Excretory vesicle ending on the right of cirrus sac.

Host: Caesio chrysozonus Cuv. (type host)
Pterocaesio tile (Cuv.)
Japan; Naha
Compared with Pseudocreadium monacanthi, differing in shape of ovary, extent of vitellaria, size.

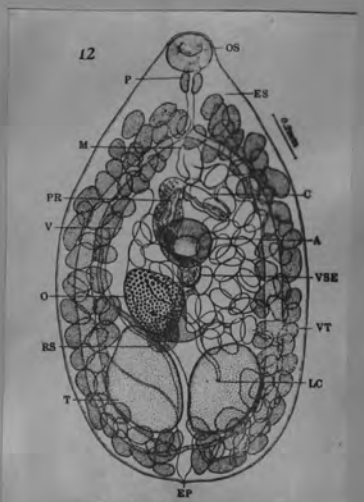


Fig. 12. *Pseudocreadium ovale*, ventral view.

Lepocreadiidae

Pseudocreadium patellare (Yamaguti, 1938) Manter, 1940

28. *Hypocreadium patellare* n. sp. Yamaguti, 1938

Body circular, strongly flattened dorsoventrally, with thin edges turned over ventrally and conspicuously indented in front of oral sucker, measuring 1.1-2.1 mm long by 1.2-2.4 mm broad as stretched out under cover glass pressure. Cuticle thin, smooth. Oral sucker subterminal, with ventral opening, 0.096-0.188×0.12-0.225 mm. Prepharynx short. Pharynx 0.09-0.125×0.123-0.188 mm. Esophagus 0.06-0.11 mm long, muscular. Ceca usually narrow, arcuate, extending to near caudal end, where they are separated from each other by vitellaria. Acetabulum 0.126-0.23 mm in diameter, just pre-equatorial. Testes ovoid, slightly indented, one on each side of median line immediately behind acetabulum and separated from cecum of its own side by vitellaria. Vasa efferentia arcuate, crossing each other at or near anterior end of ovary on its dorsal side. Vesicula seminalis externa tubular, spirally twisted, dextrodorsal to acetabulum. Cirrus pouch club-shaped, slightly curved, 0.25-0.5×0.084-0.15 mm, extending to anterodextral end of acetabulum, containing a small subglobular vesicula seminalis, a short recurved pars prostatica and a muscular eversible ductus ejaculatorius provided inside with close-set circular cuticular folds and surrounded by compact mass of accompanying cells. Prostatic cells outside of cirrus pouch, converging toward pars prostatica. Genital pore slightly to left of esophagus or pharynx. Ovary subglobular to oval, with more or less uneven surface, 0.15-0.28×0.13-0.22 mm, median or only slightly to left, between and behind two testes.

The germiduct arising from the anterodextral part of the ovary forms a marked dilatation near its origin and after uniting with the Laurer's canal near the inner end of the receptaculum seminis joins the vitelline reservoir, which lies between the ovary and the receptaculum seminis. Ootype median, dorsal, between acetabulum and ovary. Shell glands diffuse, surrounding ootype. Laurer's canal

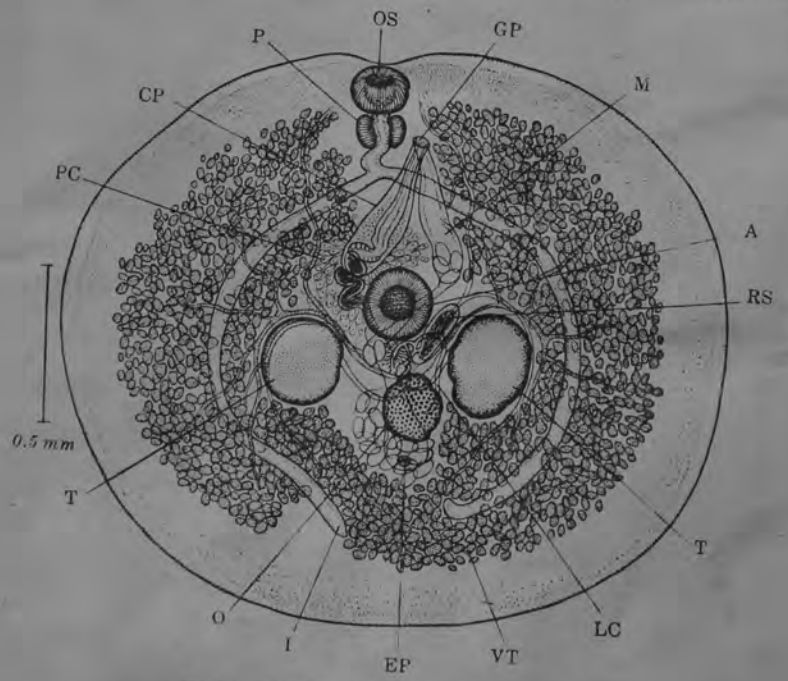


Fig. 19. *Hypocreadium patellare*; ventral view.

passing transversely on dorsal side of receptaculum seminis and then turning abruptly backwards to open dorsally a little to left of median line, usually at level of ovary and occasionally just behind it. Receptaculum seminis fusiform or elongate pyriform, 0.17-0.25 × 0.066-0.08 mm, extending obliquely in front of left testis and ovary, connected with germiduct by a short duct just at its junction with Laurer's canal. The uterus descending along the right margin of the ovary turns back on itself immediately behind the latter and ascends in an S-shaped curve in the median field. Metraterm provided with strong circular muscle fibers, and lined with thick cuticle, extending from left side of acetabulum to genital pore. In one of the numerous paratypes the uterus is distended with eggs and occupies the entire central area, covering entirely the acetabulum and partly the ovary and testes, and overreaching the anterior half of the left cecum. Eggs usually few, elliptical, thin-shelled, 63-81 × 33-43 μ in life; contained ovum not yet segmented. Vitelline follicles small, extending along each cecum, forming a broad extracecal and a narrower intercecal layer and leaving the peripheral zone free, interrupted anteriorly by pharynx and esophagus but confluent posteriorly between two cecal ends. Vitelline duct of each side running along anterior margin of testis of its own side toward vitelline reservoir mentioned above, the right proceeds a little further backward than the vitelline reservoir on the dorsal side of the anterior part of the ovary.

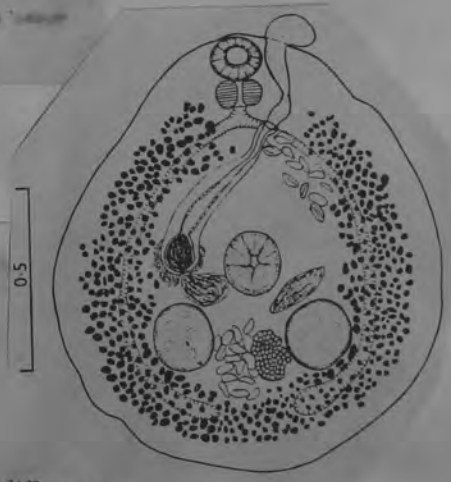
Excretory pore with rosette-shaped cuticular thickening, opening on middorsal surface behind ovary. Excretory vesicle tubular, considerably enlarged at anterior end, reaching to near posterior end of vesicula seminalis externa, giving off near its anterior end a pair of collecting vessels, each of which bifurcates in front of the testis into an anterior and a posterior relatively wide branch. The anterior branch extending to the anterior end of the vitellarium of its own side sends out a short inward branch after crossing the cecum on its ventral side while the posterior runs backward along the outer margin of the testis and after giving off a short outward branch reaches to near the intestinal termination.

Habitat. Small intestine of *Monacanthus cirrhifer* Temm. et Schleg

Locality and date. Inland Sea; August 27, 1936.

Type and paratypes in Yamaguti Helminthological Collection.

This species differs from *Hypocreadium symmetrorchis* Ozaki, 1936, in the position of the ovary and the shape of the body, although resembling it in other essential characters.



12

Lepocreadid trematodes of Indian fishes
from Hafeezullah, 1970

Pseudocreadium patellare (Yamaguti, 1938) Manter, 1940 (Fig. 12)

Host: **Sufflamen capistratus* (Shaw); trigger fish; Balistidae

Site: intestine

Number of specimens: 8

Locality: Cuticorin** India

Distribution: Japan

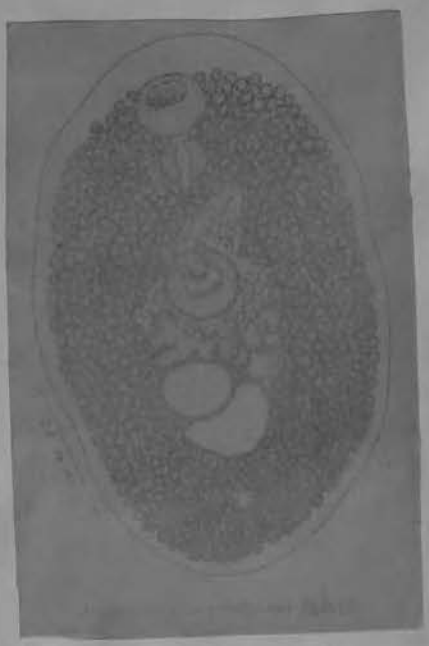
Except for certain body measurements, shape of cirrus sac and slight difference in the position of genital opening, this worm agrees fairly well with Yamaguti's (1938) description.

Leptocreadium vitellosum ~~n. sp.~~ OZAKI, 1936

Body unspined, broad and flat, length 1.7 to 1.8 mm, width more than 1/2 body length 0.95 to 1.15 mm. Oral sucker ventral a little behind anterior margin, 0.27 mm in diameter; acetabulum as large as oral sucker, directly anterior to the central level of body. Pharynx muscular, 0.15 mm in diameter; prepharynx and oesophagus very short; intestinal bifurcation near the oral sucker; caeca broad, extending to near caudal extremity. Genital pore just behind bifurcation, slightly to the left. Testes oval, 0.3–0.33 × 0.21–0.28 mm, diagonal, intercaecal, in the middle of the posterior half of body. Cirrus pouch muscular, conical in shape, slightly curved with its base dorsal to the middle of acetabulum; enclosing small round vesicula seminis interna, coiled pars prostatica, and long coiled ejaculatory duct. Behind cirrus pouch a small rounded vesicula seminis externa present.

Ovary lobed, large, elongated in transverse direction, 0.5 by 0.17 mm, between acetabulum and anterior testis. Receptaculum seminis on the left side of anterior testis. Uterine coils between ovary and acetabulum and in acetabular zone; terminal metraterm thick-walled, broad, left of cirrus pouch. Vitelline follicles fairly large and well distributed through the body, dorsally, from anterior end to posterior end, not limited to a lateral position but overlapping all the organs including the oral sucker and acetabulum. Eggs large, few in number, yellow, with stump like projection, 0.043–0.045 by 0.028–0.03 mm.

Habitat—Intestine of marine fish *Goniistius zonatus* CUVIER & VALENCIENNES.



PSEUDOCREADIUM

PSEUDOHOLORCHIS Yamaguti,1958 Lepocreadiidae

Pseudoholorchis n. g. Yamaguti, 1958

Generic diagnosis. — Allocreadiidae, Allocreadiinae: Body small, elongate, spined. Oral sucker subterminal, small; prepharynx present; esophagus very short, bifurcating about halfway between suckers; ceca extending almost to posterior end of body. Acetabulum small, in anterior third of body. Testes directly tandem, in midregion of body. External seminal vesicle present. Cirrus pouch claviform, extending forward from anterior end of acetabulum, enclosing small seminal vesicle, prostatic complex and long protrusible cirrus. Genital pore median, ventral to pharynx. Ovary deeply lobed, postacetabular, to right of median line. Receptaculum seminis elongate saccular, extending back of ovary. Vitelline follicles small, extending chiefly in extracecal fields of hindbody, confluent in posttesticular median field. Uterus winding between anterior testis and well differentiated metraterm which is club-shaped and just as long as the cirrus pouch; eggs thin-shelled, without filament. Excretory vesicle tubular, wide, reaching to posterior testis. Parasitic in intestine of marine fishes.

Genotype: *P. pulcher* (Manter, 1954) (Pl. 35, 454), syn. *Holorchis p.* M., in *Latridopsis ciliaris;* New Zealand.

This genus is characterized by the well developed cirrus pouch and metraterm extending from the anterior edge of the acetabulum to the level of the pharynx. In this respect it differs from the related *Holorchis* Stossich, 1901, and *Aephnidiogenes* Nicoll, 1915.

12. **Holorchis pulcher** n.sp. Manter, 1954

(Fig. 15)

HOST: *Latridopsis ciliaris* (Forster), moki; intestine. Latridae

LOCALITY: Wellington.

HOLOTYPE: U.S. Nat. Mus. Helminth. Collection No. 49123.

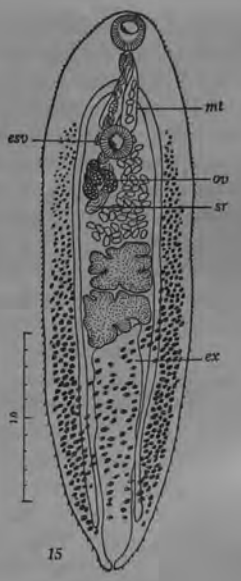
DESCRIPTION (based on 5 mature specimens): Length 3·220 to 3·920 mm.; greatest width, near acetabulum, 0·868 to 1·050. A 2·968 mm. specimen was immature. Cuticula spined over entire body but spines become sparse posterior to level of testes. Forebody 0·658 to 1·008 mm. or about 1 : 3·8 to 4·8 compared with body length. Post-testicular space 1·120 to 1·344 or 1 : 2·5 to 3 compared with body length. Oral sucker slightly longer than wide; width 0·192 to 0·231 mm.; acetabulum circular, 0·192 to 0·223 mm., equal to or very slightly smaller than oral sucker. Pharynx slightly longer than wide, 0·123 to 0·138 mm. long by 0·093 to 0·123 mm. wide. Oesophagus shorter than pharynx, bifurcation about midway between suckers; caeca narrow, extending almost to posterior end of body. Testes tandem, close together, intercaecal, at about midbody level; deeply lobed. Cirrus sac club-shaped, its opening median at level of pharynx, extending to anterior edge of acetabulum; length 0·385 to 0·525 mm., width 0·115 to 0·138 mm. Internal seminal vesicle small, ovoid, followed by a prostatic vesicle of about the same size; cirrus long, coiled when retracted, often protruded as a muscular tube. External seminal a swollen tube which bends once dorsal to acetabulum thus being more or less S-shaped and extends slightly posterior to acetabulum.

Ovary deeply lobed and irregular in shape with 4 to 6 lobes; to right of midline just posterior to acetabulum. Seminal receptacle a large elongate sac originating at left anterior edge of ovary and extending posterior to ovary. Vitelline follicles fairly small, from level of anterior edge of acetabulum to end of caeca. Anterior to the testes they are lateral to the caeca but posterior to the testes they become more dense and are confluent in the posttesticular space although there they are not so close together. Uterus extending backward in short coils to the anterior testis then forward to near anterior edge of acetabulum where it joins the conspicuous metraterm. Metraterm club-shaped approximately the same size as cirrus sac, opening slightly to the anterior left of the male pore. Metraterm content staining deeply with Delafield's stain. Thin-shelled, uncollapsed eggs 49 to 60 by 32 to 42μ, usually 53 to 57 by 38μ; collapsed eggs 53 to 57 by 27 to 36μ. Excretory pore terminal; excretory vesicle extending to posterior testis.

DISCUSSION: The genus *Holorchis* was named by Stossich (1900) with *H. pycnoporus* as type species, a trematode in *Sargus salviani* at Trieste. The only other species named in the genus is *H. legendrei* Dollfus, 1946 from *Mullus surmuletus* from the North-Western coast of France. That species Dollfus assigned to the genus provisionally because Stossich's description of the genus is incomplete notably in respect to the cirrus sac, seminal vesicle and seminal receptacle. Stossich's figure and description indicate a Lepocreadid with at least a part of the seminal vesicle outside any cirrus sac but unlike *Lepocreadium* in that the uterus extends posterior to the ovary between it and the anterior testis. Assuming a cirrus sac and a seminal receptacle to be present, that trematode appears congeneric with *H. legendrei* and *H. pulcher*. As Dollfus (1946) points out the type material of *H. pycnoporus* needs to be studied to confirm the genus. It seems probable that *Holorchis* is a genus of Lepocreadiidae similar to *Lepocreadium* except for the posterior development of the uterus which separates the ovary and anterior testis by some distance. It is very probable that when *H. pycnoporus* is better known the genus *Aephnidiogenes* Nicoll, 1915 will fall as a synonym. Although the genus was originally described as lacking a cirrus sac, Yamaguti (1934) states that a cirrus sac with internal seminal vesicle is present. Three species of *Aephnidiogenes* have been named (*A. barbatus* Nicoll, 1915; *A. major* Yamaguti, 1934; *A. isagi* Yamaguti, 1939) all from Pacific fishes. These species all differ from the above three species of *Holorchis* in that the testes are separated by a distance equal to their length but this is surely not a generic difference.

H. pulcher differs from both old world species in its lobed ovary and testes, its more anterior genital pore, relatively smaller acetabulum, and more anterior extent of the vitellaria. It differs from the species named in *Aephnidiogenes* in much more anterior genital pore, better development of the cirrus sac and metraterm, and in having contiguous testes.

The name *pulcher*, beautiful, was suggested by the general appearance of the trematode.



15

PSEUDOHOLORCHIS

Lepocreadiidae

PSEUDOLEPOCREADIOIDES Hafeezullah, 1970

Diagnosis of Pseudolepocreadioides: Body rhomboid in shape; probably spined anteriorly. Eye-spot pigment present. Acetabulum median, equatorial. Oral sucker terminal or subterminal. Prepharynx, pharynx and oesophagus present; caeca simple, extending to posterior end of body. Testes symmetrical, on either side of acetabulum. Cirrus sac club shaped, containing internal seminal vesicle, prostatic complex and cirrus. External seminal vesicle saccular. Genital pore marginal, near oral sucker. Ovary lobed, median, post-testicular, postacetabular. Seminal receptacle present. Uterus scanty, metraterm distinct. Excretory vesicle I-shaped. Type and only species: *Pseudolepocreadioides symmetrorchis.*

Remarks

Pseudolepocreadioides is closely related to *Lepocreadioides* Yamaguti, 1936, but differs in having a post-testicular ovary, and symmetrical testes in the acetabular zone.

Hafeezullah, 1970

Pseudolepocreadioides symmetrorchis gen.nov. et sp.nov. (Fig. 3)

Host: *Drepane punctata* (L.); spotted drepane; Drepanidae

Site: intestine

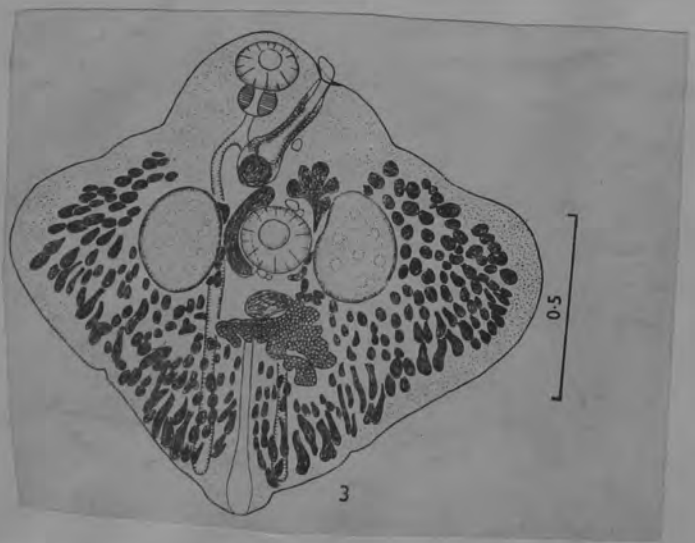
Number of specimens: 21

Locality: Veraval

Description (with measurements based on five specimens): Body 1·15–1·74 mm long, 1·37–1·57 mm wide, rhomboidal in shape. Cuticle thick; spines probably lost in processing. Acetabulum 165–277 in diameter, spherical, slightly postequatorial, median, at 462–612 from anterior end. Oral sucker 137–200 by 152–233, subspherical, subterminal. Sucker ratio 1:1·15–1·25. Prepharynx indistinct; pharynx 54–116 by 75–165, subspherical; oesophagus 30–110 long; caeca simple, straight, reaching posterior end of body.

Testes 240–300 by 146–227, oval, symmetrical, on either side of acetabulum. External seminal vesicle saccular, dorsodextral to acetabulum, extending beyond its posterior margin. Cirrus sac 336–504 by 110–134, club-shaped, lying obliquely between acetabulum and genital pore; enclosing internal seminal vesicle, well-developed pars prostatica, and cirrus; cirrus protrusible. Genital pore marginal, sinistral to oral sucker.

Ovary highly lobed, median, post-testicular, postacetabular. Seminal receptacle saccular, between ovary and acetabulum. Vitellaria consisting of small follicles occasionally becoming tubular, from level of caecal bifurcation to slightly short of posterior end of body, filling wing-like sides of body. Uterus scanty, coils between ovary and cirrus sac; metraterm distinct. Eggs (from an unmounted specimen) 51–60 by 33–48. Excretory vesicle I-shaped, extending to ovary; excretory pore terminal.



3

AHMAD, 1979

Pseudolepocreadioides secundus ~~sp. nov.~~ (Fig. 1).

Type host : *Pomacanthus annularis* (Bl.); Chaetodontidae.

Site : Small intestine.

Locality : Puri coast, Bay of Bengal.

Number of specimens: 38 from 2 of 10 hosts.

Specimens deposited No. MT 160 (Holotype); MT 161 (Paratypes).

Body rhomboid, slightly wider than long (1,230 to 1,780 long by 1,320 to 1,850 wide*). Cuticle thick, spined. Eye spot pigment present. Oral sucker spherical, subterminal, 150 to 193 in diameter; aperture ventral, oval. Acetabulum spherical, equal to oral sucker, median, preequatorial, 150 to 193 in diameter, aperture oval, 520 to 660 from anterior end of body. Forebody 37·64 to 42·27% of body length. Prepharynx indistinct. Pharynx ovoid, 76 to 94 long by 92 to 102 wide. Oesophagus 68 to 76 long. Intestinal bifurcation midway between suckers. Caeca simple, straight, terminating near posterior end of body.

Testes two, oval, smooth in outline, symmetrical, extracaecal, para-acetabular in position, 210 to 260 long by 200 to 240 wide and 151 to 188 away from acetabulum. Cirrus sac club-shaped, straight, lying obliquely between acetabulum and genital pore, 372 to 395 long by 142 to 156 wide, enclosing 95 to 116 long by 115 to 126 wide internal seminal vesicle; 100 to 130 long by 70 to 82 wide pars prostatica surrounded by prostate gland cells and 121 to 139 long cirrus. External seminal vesicle saccular, 210 to 240 long by 80 to 90 wide, extending up to middle of acetabulum. Genital pore marginal, sinistral to oral sucker.

Ovary trilobed, immediately postacetabulur, median, inter-caecal, 100 to 130 long by 82 to 90 wide. Seminal receptacle oval, postovarian, 100 to 123 long by 78 to 92 wide. Vitellaria, follicular, follicles large, extending between anterior border of testes and posterior end of body, filling wing-like sides of body. Uterus running between ovary and cirrus sac. Metraterm well developed, muscular, 256 to 287 long and 66·1 to 72·65% of cirrus sac length. Eggs 84 to 91 long by 39 to 50 wide. Excretory vesicle I-shaped, extending to ovary; excretory pore terminal.

The new species differs from the genotype *Pseudolepocreadioides symmetrorchis* Hafeezullah, 1970 and the only other species in the genus in having suckers of equal size instead of unequal, ovary trilobed and immediately postacetabular instead of deeply lobed and well posterior to acetabulum, seminal receptacle postovarian instead of between ovary and acetabulum, external seminal vesicle extending up to middle of acetabulum instead of up to posterior border of acetabulum, testes are well separated from acetabulum instead of close to it, vitellaria extending between anterior border of testes instead of form level of caeca bifurcation and eggs of larger size (51 to 60 by 33 to 481 in *P. symmetrorchis*).

* All measurements are given in microns. Holotypes and paratypes are deposited with the Helminthological collection of the Zoological Museum of Shibli National College, Azamgarh.

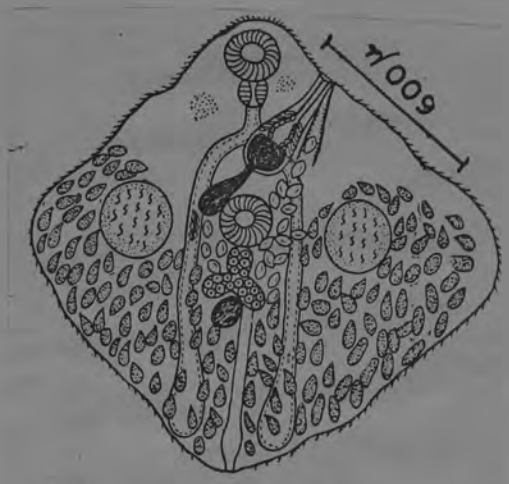


FIG. 1. *Pseudolepocreadiodes secundus* sp. nov. ventical view of the holotype.

PSEUDOLEPOCREADIOIDES

PSEUDOPARVUM-
CREADIUM

Pseudopisthogonoporus ~~n. g.~~ Yam., 1970

GENERIC DIAGNOSIS: Lepocreadiidae, Opisthogonoporinae. Body elongate, spinulate, tapering anteriorly. Oral sucker terminal; prepharynx very long; pharynx small; esophagus much shorter than prepharynx; ceca terminating at posterior extremity. Acetabulum in posterior half of body, larger than oral sucker. Testes tandem or oblique, in posterior third of body. External seminal vesicle present. Cirrus pouch cylindrical, postacetabular, enclosing saccular seminal vesicle, well developed prostatic complex, and eversible muscular ejaculatory duct. Genital pore marginal or submarginal, sinistral, in anterior part of hindbody. Ovary small, anterodextral to anterior testis. Seminal receptacle and Laurer's canal present. Uterus with few coils; metraterm well developed; eggs oval, not very numerous. Vitellaria circumcecal, commencing immediately behind intestinal bifurcation. Excretory vesicle tubular, extending to level of ovary. Intestinal parasites of marine teleosts.

TYPE SPECIES: *P. vitellosus* (Pritchard, 1963) n. comb., syn. *Opisthogonoporus vitellosus* Pritchard, 1963, in *Naso brevirostris* (type host), *N. hexacanthus*, and *Melichthys vidua*; Hawaii.

Pseudopisthogonoporus Yamaguti, 1970 emend

Diagnosis: Body elongate. Ventral sucker larger than oral, postequatorial. Prepharynx long. Esophagus shorter than prepharynx. Intestinal ceca extending to posterior end of body. Testes tandem, or oblique. Cirrus sac immediately postacetabular. Common genital pore marginal, or submarginal, in vicinity of ventral sucker. Vitellaria extending from esophageal bifurcation to posterior end of body. Excretory vesicle extending to ovary.

Type species: Pseudopisthogonoporus vitellosus (Pritchard, 1963) Yamaguti, 1970 (syn. *Opisthogonoporus vitellosus* Pritchard, 1963), in *Naso brevirostris* (type host), *N. hexacanthus*, *Medichthys vidua*, Hawaii, USA.

FROM NASIR AND GOMEZ, 1977

Opisthogonoporus vitellosus ~~sp. n.~~ PRITCHARD, 1963
(Figs. 1 and 2)

Hosts: Naso unicornis (Forskål), kala, unicorn fish (Acanthuridae), type host; 20 specimens from 9 of 22 hosts. *N. brevirostris* (Cuv. and Val.); 18 specimens from five of five hosts. *N. hexacanthus* (Bleeker); six specimens from three of four hosts. *Melichthys vidua* (Solander), humuhumu-hi'u-kole or humuhumu-uli (Balistidae); one specimen from one of five hosts.

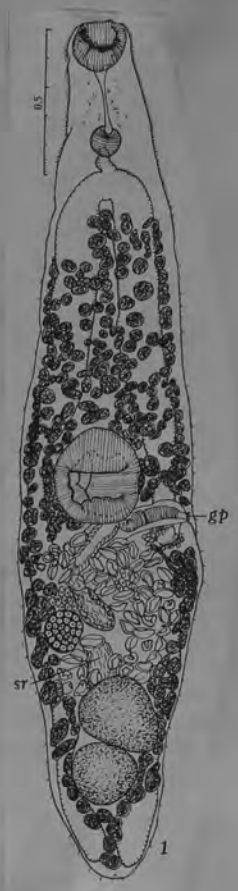
Location: Intestine.

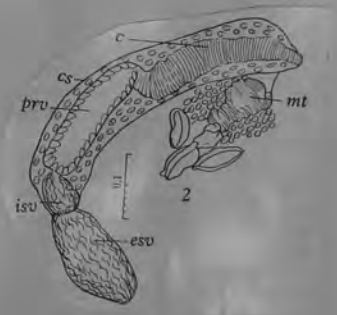
Holotype: No. 59888.

Description (based on 13 specimens): Body elongate, widest immediately posterior to acetabulum, tapered anteriorly and posteriorly; 1.374 to 2.848 long by 0.355 to 0.677 wide; forebody about half body length with scattered granules of eyespot pigment; cuticula spined, spines decreasing in number and size from anterior to posterior end of body, those of hindbody often lost. Oral sucker rounded, 0.115 to 0.181 wide by 0.096 to 0.181 long; acetabulum at or near midbody, 0.192 to 0.322 wide by 0.192 to 0.409 long (0.235 to 0.355 deep), aperture more or less rectangular with narrow band of circular muscles; sucker ratio 1 : 1.4 to 1.9. Prepharynx slender, 0.134 to 0.214 long; pharynx 0.060 to 0.114 long by 0.064 to 0.134 wide; esophagus shorter than pharynx, 0.047 to 0.094 long; cecal bifurcation one-sixth to one-fourth body length from anterior end, ceca moderately wide, extending to posterior end of body, ending blindly.

Testes more or less tandem, near posterior end of body, 0.109 to 0.268 long by 0.093 to 0.255 wide, equal or subequal, rounded, smooth, contiguous. External seminal vesicle saccular, 0.067 to 0.219 long by 0.029 to 0.120 wide, anteromedian to ovary. Cirrus sac (Fig. 2) immediately postacetabular, preovarian, 0.296 to 0.502 long by 0.072 to 0.255 wide, curving across body from right cecum to genital pore, containing: more or less spherical internal seminal vesicle, 0.032 to 0.128 long by 0.024 to 0.083 wide; elongate prostatic vesicle, 0.112 to 0.232 long by 0.034 to 0.080 wide; elongate, protrusible, muscular cirrus, 0.168 to 0.328 long by 0.072 to 0.104 wide; tip of cirrus with minute papillae or spines. Genital pore sinistral, marginal, at level of posterior edge of acetabulum.

Ovary dextral, pretesticular, smooth, round, 0.075 to 0.147 long by 0.064 to 0.134 wide; Mehlis' gland preovarian; Laurer's canal extending posteriorly from ovarian level; seminal receptacle postovarian, overlapping anterior testis, 0.146 to 0.344 long by 0.056 to 0.125 wide. Uterus pretesticular, more or less filling space between anterior testis and cirrus sac. Metraterm carrot-shaped, tapering toward proximal end, 0.088 to 0.184 long by 0.026 to 0.082 greatest width; wall thick with tall, narrow cells, surrounded by small gland cells, tip slightly protrusible. (A single immature specimen rather clearly showed a thin metraterm sac not visible in mature specimens.) Vitelline follicles moderately large, circumcecal, extending from near cecal bifurcation to posterior end of body; at level of posterior testis follicles extend inward and meet medianly, leaving lateral and posterior margins of cecal tips exposed. Eggs thin-shelled, yellow, 61 to 75 long by 42 to 53 wide. Excretory pore terminal; vesicle I-shaped, extending forward to level of ovary.





Discussion: The type and only other species in the genus is *Opisthogonoporus amadai* Yamaguti, 1937, from *Branchiostegus* in Japan. *O. vitellosus* differs in many ways. The acetabulum is at midbody and much posterior to the cecal bifurcation rather than far forward and ventral to the bifurcation. The prepharynx is long and esophagus short, rather than the reverse. The vitellaria are much more extensive anteriorly; the preporal coil of the uterus is lacking; the ovary is dextral; and the eggs are much larger.

HAWAII —

Subfamily OPISTHOGONOPORINAE Yamaguti, 1958

74. *Pseudopisthogonoporus vitellosus* (Pritchard, 1963) n. comb.

Syn. *Opisthogonoporus vitellosus* Pritchard, 1963

(Fig. 88)

HABITAT: Intestine of *Naso brevirostris* (type host, local name "kala") and *N. hexacanthus*; Hawaii.

DESCRIPTION (based on 28 whole mounts): Body elongated flask-shaped, spinulate, 1.25-2.55 mm long, up to 0.3-0.6 mm wide immediately behind acetabulum; forebody attenuated, longer than hindbody. Oral sucker terminal, 0.08-0.15 × 0.08-0.19 mm; prepharynx 0.03-0.37 mm long, definitely longer than esophagus without exception; pharynx 60-120 × 70-140 μ, often contracted anteriorly to form a neck. Esophagus 30-200 μ long. Ceca wide, ending blindly at posterior end of body. Acetabulum 0.15-0.3 mm in diameter, in posterior part of middle third of body.

Testes subglobular, 0.13-0.25 × 0.11-0.32 mm, directly tandem or oblique, intercecal, near posterior extremity. External seminal vesicle oval, 0.1-0.14 × 0.08-0.12 mm, anteroventral to ovary. Cirrus pouch subcylindrical, comparatively thin-walled, 0.2-0.5 × 0.05-0.1 mm, situated transversely immediately behind acetabulum, enclosing rounded internal seminal vesicle, well-developed prostatic complex, and eversible ejaculatory duct provided with inner longitudinal and outer circular muscle fibers; when this duct becomes fully everted, the tip of the cirrus is seen covered with minute spines as described by Pritchard. Genital pore on, or close to, left margin of body at level of posterior end of acetabulum.

Ovary spherical to oval, 70-160 × 60-120 μ, situated anterodextral to anterior testis, overlapping external seminal vesicle. Germiduct arising from dorsal side of ovary, joining Laurer's canal and seminal duct near its origin and soon uniting with vitelline duct coming from behind to lead into ootype. Laurer's canal opening outside dorsal to anterior testis. Seminal receptacle situated transversely anterodorsal to anterior testis. Uterus coiled between anterior testis and cirrus pouch; metraterm well developed, usually distended with eggs. Eggs oval, 56-72 × 35-56 μ in balsam mounts, 48-54 × 34-38 μ in life. Vitelline follicles circumcecal, extending from behind intestinal bifurcation to cecal ends; vitelline reservoir postovarian or between ovary and anterior testis, or rather immediately pretesticular. Excretory vesicle I-shaped, extending to level of ovary.

DISCUSSION: Although Pritchard assigned this species to *Opisthogonoporus* Yamaguti, 1937, the differences between the present species and the type species of *Opisthogonoporus* are too great to be of specific significance, as are shown in the table below.

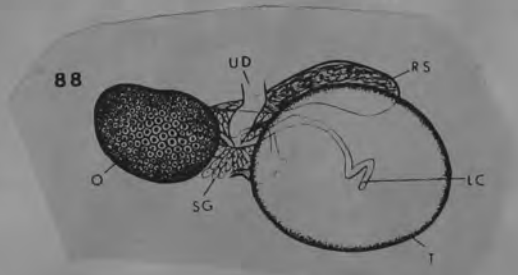


TABLE 1

DIFFERENTIATING *Pseudopisthogonoporus* FROM *Opisthogonoporus*

CHARACTER	*Opisthogonoporus*	*Pseudopisthogonoporus*
ESOPHAGUS	much longer than prepharynx	definitely shorter than prepharynx
ACETABULUM	near anterior extremity	postequatorial
PARS PROSTATICA	none	well developed
VITELLARIA	confined to posterior hindbody	extending well into forebody

PSEUDOPISTHOGON-
OPORUS

Rhagorchis Manter, 1931

Syn. *Gargorchis* Linton, 1940

Generic diagnosis. — Allocreadiidae, Allocreadiinae: Body elongate, somewhat fusiform or plump. Oral sucker, pharynx and acetabulum moderately well developed, latter in anterior half of body. Esophagus bifurcating immediately in front of acetabulum, ceca terminating at posterior extremity. Testes usually 11, in one median group in posterior half of body. Cirrus pouch elongate claviform, extending posterior to acetabulum. Vesicula seminalis externa present, surrounded by prostate cells. Genital pore to the left of esophagus. Ovary median or submedian, lobed, immediately in front of testes. Uterus anterior to ovary. Eggs without filament. Vitellaria extending in lateral fields from level of ovary to posterior extremity. Excretory vesicle tubular, reaching to acetabulum. Parasitic in intestine of marine fishes.

Genotype: *R. odhneri* Manter, 1931, syn. *Gargorchis varians* Linton, 1940 (Pl. 9, Fig. 114), in *Ceratacanthus schoepfi;* Beaufort.

~~Strigeidae~~

Rhagorchis Manter, 1931

GARGORCHIS n. ~~gen.~~ LINTON, 1940

Characters of genus: Cuticle spinose; ventral sucker larger than oral; esophagus present; rami of intestine long; main excretory vessel a single median trunk from posterior end to ventral sucker; genital opening in front of ventral sucker; cirrus pouch extending back of ventral sucker and enclosing a seminal vesicle. A second seminal vesicle lies at the posterior end of the cirrus pouch. Testes many (11 in type species), median, behind ovary; ovary behind ventral sucker and in front of testes; seminal receptacle near ovary; vitellaria diffuse; uterus mainly in front of ovary.

This genus is a synonym of Rhagorchis Manter, 1931. - wm.

G. varians is considered a synonym of R. odhneri Manter, 1931 from Cerataacanthus schoepfii at Beaufort.

Examination of the co-type specimen of R. odhneri indicates that body spines had been present but lost. All measurements & proportions agree. The host is the same. The characteristic glandular external seminal vesicle is the same.

Rhagorchis differs from Multitestis in that the uterus is entirely preovarian

From Linton, 1940

Allocreadiidae
Allocreadiinae

RHAGORCHIS Manter, 1931

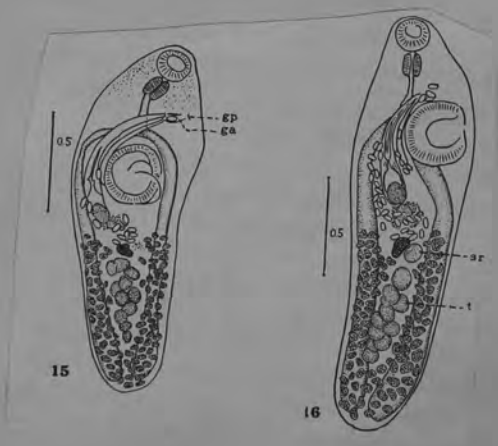
Numerous testes in single median group. Genital well to the left about midway between the suckers. Cirrus sac extending posterior to ventral sucker. External seminal vesicle surrounded by gland cells. Ovary median, lobed, anterior to testes. Uterus anterior to ovary. Eggs without filament. Well developed genital atrium.

Type species: Rhagorchis odhneri
Host: Ceratocanthus schoedfi
Locality: Beaufort, N.C.

Differs from Multitestis in sucker ratio, unspined body, anterior uterus, genital atrium, and by the ovary being anterior to all the testes.

Rhagorchis odhneri Manter, 1931

Body elongate-oval, rounded at both ends, without spines, 1.75 to 2 by 0.56 to 0.59 mm. Ventral sucker about 1/3 or a little less from anterior end, larger than oral sucker (ratio: 1½ to 2 : 1) Genital pore near the left body margin, about midway between suckers. Prepharynx lacking, esophagus longer than pharynx; large ceca to posterior end. 11 testes, median, extending as an irregular longitudinal group from just behind ovary to posterior end. Genital atrium well developed; cirrus sac clavate, extending from genital atrium in a broad curve around right edge of ventral sucker to about ½ way between sucker and ovary. External seminal vesicle surrounded by gland cells. Ovary median, lobed, anterior to testes, 4-lobed. Seminal receptacle present. Uterus anterior to ovary. Eggs 59 to 64 by 35 u. Metraterm extending to near posterior border of ventral sucker. Vitellaria extending anterior only to level of ovary. Excretory bladder extending foward to the ventral sucker.



Rhagorchis odhneri Manter, 1931

Host.—*Ceratacanthus scripta* (Osbeck), *scrawled filefish* [new host record].

Location.—1/3 intestine.

Locality.—Lerner fish pens, Bimini, B.W.I. [new locality record].

Discussion.—One immature specimen agreed in almost all details with *R. odhneri* described by Manter (1931) from *Ceratacanthus schoepfi* in Beaufort, N.C. and later reported from the same host and *Monocanthus ciliatus* in Tortugas by Manter (1947).

Sogandares, 1959

Rhagorchis odhneri Manter, 1931
Synonym: Gargorchis varians Linton, 940.

Host: Alutera schoepfii (J). JAMAICA
Site: intestine.

Manter (1931) described the excretory esicle as being tubular but in our living pecimens it was distinctly Y-shaped, bi-urcating dorsal to the ventral sucker to form oluminous arms extending to the sides of he pharynx. The main excretory tubules vidently leave the stem of the vesicle and livide into anterior and posterior tubules efore reaching the acetabular level.

FROM NAHHAS AND CABLE (1964)

Rhagorchis odhneri syn:

GARGORCHIS VARIANS, [illegible]: LINTON, 1940

Body covered with minute spines, dense anteriorly, sparse posteriorly, rather plump, usually broadest at level of ventral sucker, with short neck and tapering postacetabular region, but may be either long or short oval-elliptical, or fusiform; neck very variable, usually strongly contracted in preserved specimens. Oral sucker subterminal, usually broader than long; prepharynx short; pharynx of good size, usually longer than broad, approximately as long as the oral sucker and about half as broad; esophagus as long as or longer than the pharynx, but often appearing shorter on account of the contracted condition of the neck; intestinal rami with thick walls and extending to the posterior end. The ventral sucker is much larger than the oral, its opening transverse. The genital pore is in front of the ventral sucker to the left of the median line, and about on a level with the posterior end of the pharynx. The cirrus is smooth, the cirrus-pouch long-pyriform, muscular, extending back of the ventral sucker on the left side and enclosing a seminal vesicle at its posterior end. A second seminal vesicle lies behind and beside the posterior end of the cirrus-pouch. The second seminal vesicle and the base of the cirrus-pouch are surrounded by cells of the prostate gland. Testes, eleven in number so far as observed, roundish or subtriangular in outline, median, in two more or less irregular longitudinal rows, in the posterior half of the postacetabular region. Ovary small, about 3-lobed, in front of testes, and usually a little to the right of the midventral line; in most cases behind the level of the seminal vesicles, but in some cases on a level with the base of the cirrus pouch, and near the ventral sucker. The shell gland and yolk reservoir are at the posterior border of the ovary. There is a seminal receptacle behind the ovary. It is dorsally placed with respect to the ovary, and in compressed specimens may appear to be to the right of the median line in some cases, to the left in others; often it appears to be to the right of the median line and on a level with the anterior testes. Laurer's canal was seen in a series of cross sections (fig. 339). The diffuse vitellaria fill the greater part of the space back of the testes and extend forward nearly or quite to the ventral sucker. The uterus lies between the testes and ventral sucker; the metraterm lying beside the cirrus pouch and lateral to it, joining the cirrus pouch very near the genital pore. The ova are thin-shelled; maximum in balsam about 0.060 by 0.036 mm.

The relative positions of ovary, seminal vesicles, seminal receptacle and first testes are subject to some variation with different degrees of contraction, and with varying amounts of sperm in the vesicles.

The main excretory vessel is conspicuous in living specimens, and was traced from the terminal excretory pore to a point dorsal to the ventral sucker. In series of cross sections the excretory vessel was traced to the level of the ventral sucker, but the arrangement of the excretory vessels in the neck was not satisfactorily shown.

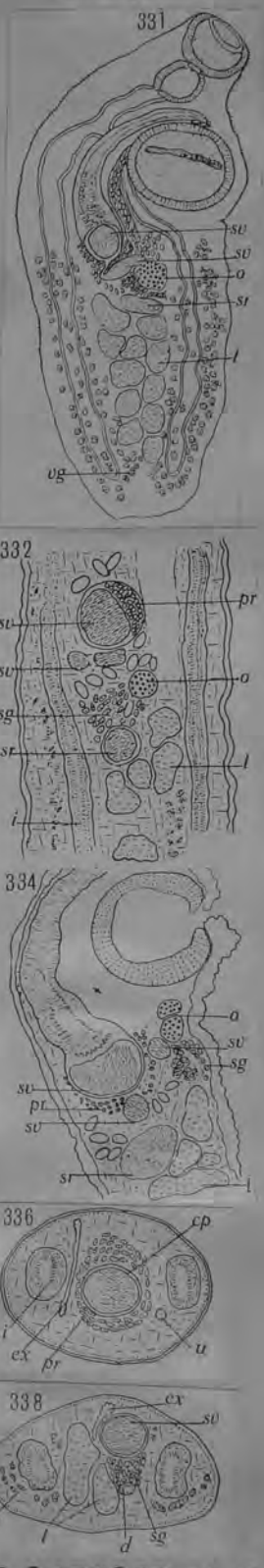
Measurements, average of nine specimens, in balsam: Length, 2.28 mm.; breadth, 0.82 mm.; oral sucker, length, 0.20 mm., breadth, 0.23 mm.; pharynx, length, 0.20 mm., breadth, 0.13 mm.; ventral sucker, length, 0.32 mm., breadth, 0.35 mm.; ova about 0.06 by 0.03 mm. Longest of the nine specimens, length, 3.08 mm., breadth, 0.63 mm.; broadest of the nine specimens, length, 2.01 mm., breadth, 0.94 mm.

Average of nine specimens in balsam, more or less oval-elliptical in outline, post-acetabular region not tapering: Length, 1.31 mm.; breadth, 0.67 mm.; oral sucker, length, 0.16 mm., breadth, 0.20 mm.; pharynx, length, 0.15 mm., breadth, 0.10 mm.; ventral sucker, length, 0.27 mm., breadth, 0.32 mm.; ova, 0.054 by 0.033 mm. to 0.063 by 0.039 mm. Longest of the nine specimens, length, 2.10 mm.; breadth, 0.94 mm.; broadest of the nine specimens, length, 1.98 mm.; breadth, 1.08 mm.

Type specimens.—U.S.N.M. No. 8401 (holotype and paratypes).

Host.—Filefish (*Ceratacanthus schoepfi*).

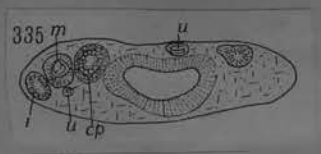
~~Strigeidae~~

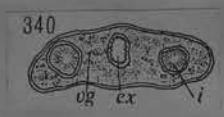


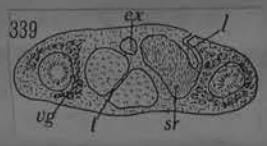
MORE PICTURES ON BACK.

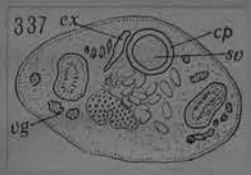
From Linton, 1940

RG.









44. RHAGORCHIS ODHNERI Manter, 1931

SYNONYM: *Gargorchis varians* Linton, 1940.*

HOSTS: *Alutera schoepfii* (Walbaum), filefish; in both of 2 hosts examined. *Monacanthus ciliatus* (Mitchill), filefish; in 1 of 18 hosts examined.

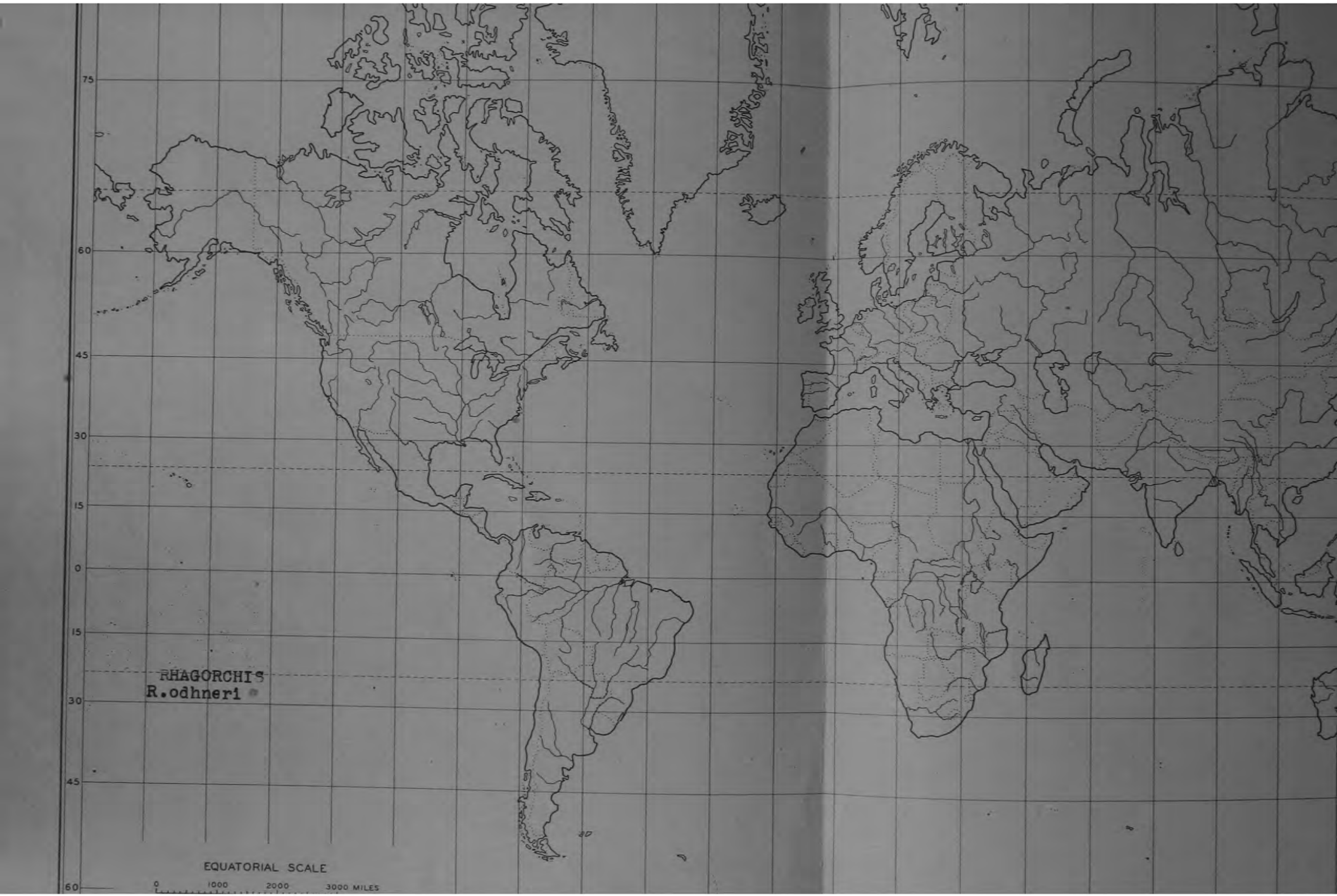
LOCATION: Intestine.

LOCALITIES: Tortugas, Florida; Beaufort, North Carolina; Woods Hole, Massachusetts.

Discussion: A study of co-types of this species indicates that body spines had been present but lost. Specimens collected at Tortugas have spines anteriorly. *Rhagorchis* is therefore very closely related to *Multitestis* Manter 1931. It differs in that the uterus is entirely preovarian. The genus *Gargorchis* Linton, 1940 and its species, *G. varians*, are clearly synonyms of *Rhagorchis* and *R. odhneri*, respectively, and are from the same host. This trematode, with its hosts, ranges north to Beaufort and Woods Hole. The poorly described *Distomum pallens* Rud. of Linton (1898) is probably also this species.

* New synonymy.

An immature specimen from *Monacanthus* shows the testes in two clusters of 5 each, suggesting that these organs start as two and fragment into ten.


75
60
45
30
15
0
15
30
45
60
RHAGORCHIS
R.odhneri
EQUATORIAL SCALE
0 1000 2000 3000 MILES

RHAGORCHIS

Lepocreadiidae

RHYNCHOCREADIUM C. B. Srivastava, 1962

Diagnosis of RHYNCHOCREADIUM gen nov. : Small cylindrical body, cuticle spinous. Oral sucker terminal. Acetabulum pedicellate. Prepharynx absent, pharynx small, oesophagus slender and caeca terminating almost at the posterior extremity. Testes oval, tandem. Vesicula seminalis bipartite, cirrus pouch preacetabular. Ovary round, pretesticular. Uterus pretesticular. Vitellaria from ovarian level to the posterior end of the body. Genital pore lateral and preacetabular. Excretory vesicle reaching the acetabulum.

Type species : *Rhynchocreadium aculeatum* sp. nov.

SYSTEMATIC POSITION

Following the key of the family Allocreadiidae Stossich, 1904 (vide Dawes, 1946), the new genus *Rhynchocreadium* comes closer to the subfamily Lepocreadiinae Odhner, 1905 in having a spinous cuticle, a well developed cirrus sac, excretory vesicle reaching upto the acetabulum, tandem testes and extension of the uterus. It differs from Lepocreadiinae in the absence of eye spots, and vesicula seminalis externa. Further, *Rhynchocreadium* is parasitic in fresh water fish whereas Lepocreadiinae are parasites of marine fishes.

author says Allocreadiidae

According to the key to subfamilies of Allocreadiidae as proposed by Yamaguti (1958), *Rhynchocreadium* shows great many resemblances to the subfamily Aephnidiogenetinae Yamaguti, 1934 in having an elongate body, spinous cuticle, caeca reaching posterior extremity, position of acetabulum, arrangement and position of testes and in the distribution of vitelline follicles. But it differs from Aephnidiogenetinae in the absence of vesicula seminalis externa and the extension of the excretory vesicle upto the acetabulum.

The new genus falls under the subfamily Allocreadiinae LOOSS, 1902 as it agrees in having elongate body, caeca reaching the posterior extremity of the body, tandem testes, absence of external seminal vesicle, vitelline follicles extending into the forebody and extension of uterus.

see Allocreadium mehrai Gupta, 1956

Among Allocreadiinae the genus *Rhynchocreadium* agrees with the genus *Stegodexamene* Macfarlane, 1951 in the presence of the cuticular spines, extension of the excretory vesicle to the ventral sucker, intestinal caeca reaching the posterior extremity, bipartite nature of the seminal vesicle, muscular cirrus, preacetabular position of the genital pore, presence of the receptaculum seminis and the distribution of the vitelline follicles. However, new ganus *Rhynchocreadium* can be distinguished from *Stegodexamene* in the absence of larval eye spot and prepharynx and by the possession of tandem testes, cirrus pouch terminating in front of the acetabulum and the cup-shaped acetabulum being situated on a short elevation or pedicel like structure.

(one) Yamaguti says subgenus of Stegodexamene Macfarlane, 1951

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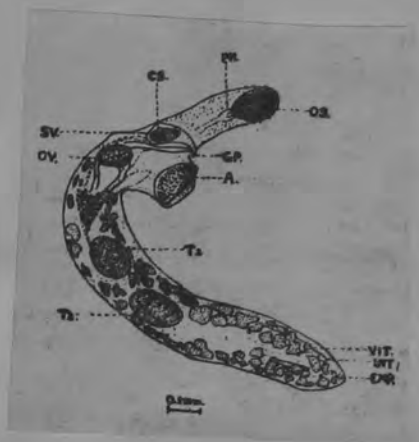
Lepocreadiidae

RHYNCHOCREADIUM ACULEATUM [illegible] C.B. SRIVASTAVA, 1962

(Fig. 1)

Host—*Rhynchobdella aculeata* Bloch.
Location—Intestine.
Locality—Bhagalpur (River Ganges).



The body is cylindrical, measuring 1.368-2.160 mm. in length and 0.192-0.276 mm. in width at the middle of the body. In the region of the oral sucker the cuticle is armed with few minute spines.

The oral sucker is terminal, almost round, measuring 0.168 × 0.108-0.132 mm. Prepharynx is absent and the oral sucker leads directly into a small pharynx. The oesophagus is a slender structure which bifurcates into the intestinal caeca slightly anterior to the acetabulum. The intestinal caeca terminate some distance before the posterior extremity.

Two testes are tandem, almost equal in size, situated in the middle portion of the body. The anterior testis measures 0.144-0.204 × 0.132-0.156 mm. and the posterior testis measures 0.144-0.228 × 0.132-0.156 mm. Vasa efferentia from both the testes run anteriorly and meet near the acetabulum, just before opening into the cirrus sac. The cirrus sac measuring 0.168-0.216 × 0.072-0.084 mm., is club-shaped, situated anterior and dorsal to the acetabulum. The vesicula seminalis is bipartite. The cirrus is muscular. Genital pore is lateral, just anterior to the acetabulum.

Ovary is ovoid, measuring 0.132-0.144 × 0.084-0.096 mm., situated almost in level with the acetabulum. In few specimens the ovary was observed to lie near the middle of the body. The oviduct originates from the left side of the ovary. After running a short distance, it curves slightly backwards to meet the shellgland mass. Receptaculum seminis and Laurer's canal are present. The uterus is pretesticular. Eggs are small and non-filamentous.

Vitelline follicles of the two sides become contiguous at the posterior end of the body and anteriorly they extend almost upto the level of the ovary. Vitelline ducts from both sides meet to form the vitelline reservoir just behind the ovary.

The excretory vesicle is tubular and extends upto the acetabulum or beyond. The excertory pore is terminal.

During September and October, 1960, twenty specimens of the fresh water spiny eel, *Rhynchobdella aculeata* Bloch, were examined. Only five of them were found infected with this parasite, each host containing ten to fifteen trematodes. The parasites were fixed in Bouin's fluid under slight pressure of coverslip and stained with Ehrlich's Haemotoxylin. These parasites are referred to a new genus *Rhynchocreadium* of the family Allocreadiidae Stossich, 1904.

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— OVER —

RHYNCHOCREATIDUM

PEN-TAB

LOOSE LEAF INDEX

SCHEDULE

PERIOD OR TIME								
COURSE . . . . . MON.								
INSTRUCTOR								
COURSE . . . . . TUES.								
INSTRUCTOR								
COURSE . . . . . WED.								
INSTRUCTOR								
COURSE . . . . . THURS.								
INSTRUCTOR								
COURSE . . . . . FRI.								
INSTRUCTOR								
COURSE . . . . . SAT.								
INSTRUCTOR								

NAME _____

ADDRESS _____

SCHOOL _____ TELEPHONE _____

MADE IN U. S. A.

10¢

Sphincteristomum Oshmarin, Mamaev et Parukhin, 1961

see reprint -

Lepocreadiidae

Sphincteristomum acollum Oshmarin, Mamaev et Parukhin, 1961

see reprint

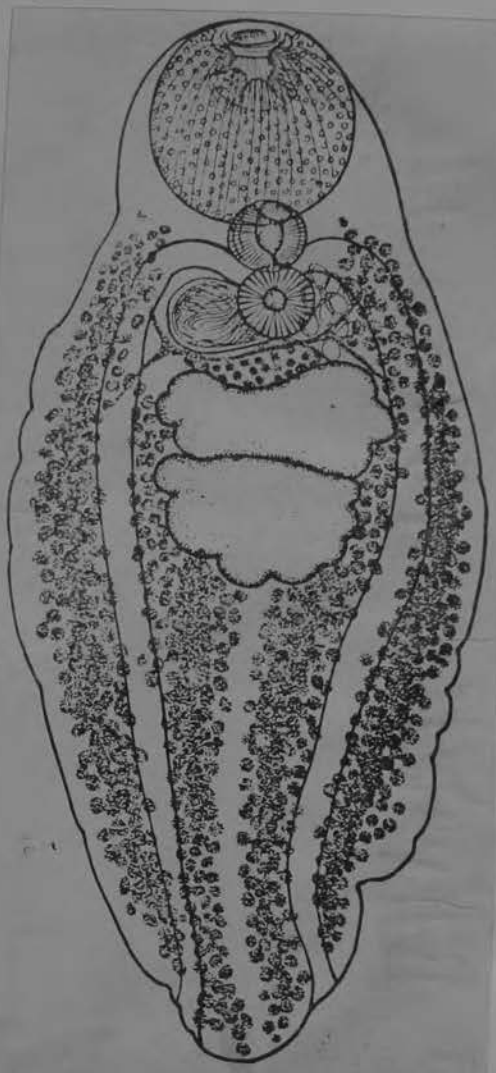

Рис. 3. *Sphincteristomum acollum* gen. et sp. nov.

Lepocreadiidae

SPINOPLAGIOPORUS Skrjabin & Koval, 1958

Диагноз рода *Spinoplagioporus*

Plagioporinae. Форма тела овальная. Кутикула несет на всей поверхности многочисленные шипики. Диаметр ротовой присоски несколько больше ротовой. За ротовой присоской непосредственно следует фаринкс; префаринкс отсутствует. Пищевод очень короткий. Половое отверстие открывается по медианной линии тела, на уровне развилка кишечника. Половая бурса тянется до задней трети брюшной присоски. В проксимальной части половой бурсы расположен сферический семенной пузырек. Простатическая часть хорошо выражена; циррус короткий. Семенники и яичник цельнокрайные. Последний расположен рядом или несколько кпереди от переднего семенника. Многочисленные желточные фолликулы тянутся по бокам тела от передней присоски до заднего конца тела. Грушевидный семяприемник расположен над яичником. Лауреров канал имеется. Петли матки расположены в области брюшной присоски и несколько кзади от нее. Количество яиц в матке невелико. Паразиты морских рыб.

Типичный и единственный вид: *Spinoplagioporus minutus* (Poljansky, 1952).

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Opecoelidae

Plagioporus minutus Poljanskii, 1952

from: Dienske (1968):

Trematoda—Digenea

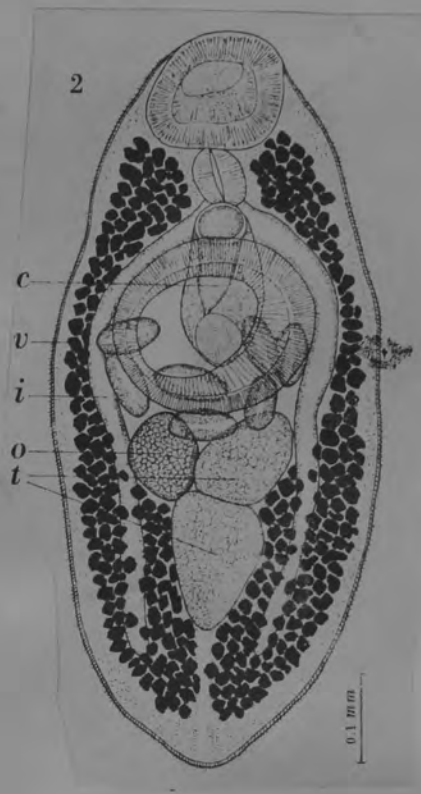
Plagioporus minutus Poljanskii 1952 (Fig. 2)

Plagioporus minutus Poljanskii, 1952: 266–247, fig. 1; Poljanskii, 1955: 47.

This very small parasite has been described by POLJANSKII from the intestine of *Chimaera monstrosa* from the Barents Sea. He examined five fishes, all of which appeared to be infested. The intensity varied from 1 to 283.

RUSZKOWSKI (1934: 489) found two very small trematodes in two chimaeras. He stated that they resembled *Lebouria alacris* (Looss), which is now called *Plagioporus alacer* (Looss), an intestinal parasite of Labridae. RUSZKOWSKI possibly had specimens of *Plagioporus minutus* before him. We did not find it, but possibly overlooked this minute parasite.

Other records of *Plagioporus minutus* are not known. The genus *Plagioporus* includes numerous species from a great variety of hosts, distributed all over the world.



Spinoplagioporus minutus (Poljansky, 1952) Skrjabin et Koval, 1958

(Рис. 276)

Синоним: *Plagioporus minutus* Poljansky, 1952

Хозяин: химера — *Chimaera monstrosa* L.

Локализация: кишечник.

Место обнаружения: СССР (Северная Атлантика).

Историческая справка. Полянский вскрыл пять экземпляров *Chimaera monstrosa*, причем все экземпляры были инвазированы этой трематодой. Интенсивность инвазии колебалась от 1 до 283 экземпляров. Полянский (1955) высказывает предположение, что распространение этого вида не ограничивается западными районами Баренцова моря и северо-восточными Норвежского, а связано с распространением химер в Атлантике.

Описание вида (по Полянскому, 1952). Форма тела червя при рассматривании со спинной или брюшной стороны близка к овальной или яйцевидной. В дорзо-вентральном направлении, как показывает изучение поперечных срезов, тело сплющено не очень сильно. В живом состоянии при сокращении червя форма его меняется относительно мало. Размеры варьировали в следующих пределах: длина 0,71—1,04 мм, ширина 0,29—0,47 мм. Измерения делались на препаратах, фиксированных спиртом, окрашенных и заключенных в канадский бальзам.

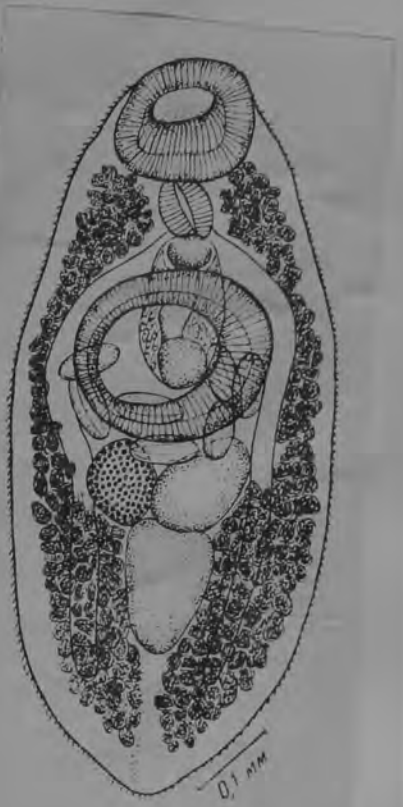
Диаметр брюшной присоски несколько больше ротовой. Брюшная присоска смещена кпереди; ее задний край находится на уровне середины тела. Диаметр ротовой присоски 0,15—0,21 мм. Диаметр брюшной присоски 0,17—0,29 мм. Кутикула несет на всей своей поверхности многочисленные шипики, направленные своим острием назад. Эти шипы имеют длину от 8—10 μ. Они проходят через всю толщу кутикулы, толщина которой около 5 μ и доходят до кольцевого слоя мускулатуры. Располагаются кутикулярные шипики правильными рядами, перпендикулярно к продольной оси тела. Мускулатура кожно-мускульного мешка и дорзо-вентральные мышцы развиты относительно слабо.

За ротовой присоской непосредственно следует фаринкс. Префаринкс отсутствует. Длина фаринкса 0,06—0,09 мм. Пищевод очень короткий, почти не выражен. Бифуркация кишечника находится у переднего края брюшной присоски. Протяженность ветвей кишечника варьирует. Они заканчиваются или немного не доходя до заднего конца второго семенника, чаще на уровне семенника, иногда же тянутся назад несколько дальше края семенника.

Половое отверстие открывается на брюшной стороне по медианной линии тела, сразу впереди переднего конца брюшной присоски, на уровне развилка кишечника.

Два крупных семенника располагаются позади брюшной присоски, вдоль медианной линии тела. Из них передний обычно бывает несколько сдвинут в сторону (влево), что зависит, вероятно, от расположенного по соседству с ним яичника. Семенники цельнокрайные, форма их приближается к овальной, иногда передний семенник почти округлый. Размеры переднего семенника 0,09—0,15×0,08—0,12 мм, заднего 0,08—0,19×0,12—0,18 мм. Короткие vasa efferentia соединяются в короткий vas deferens, лежащий по медианной линии на спинной стороне. Семяпровод вскоре переходит в половую бурсу. Последняя весьма объемиста; она оканчивается у задней трети брюшной присоски и тянется до полового отверстия. Длина половой бурсы 0,15—0,24 мм. Она хорошо, как это видно на срезах, отграничена от окружающей паренхимы и имеет собственную стенку. В проксимальной части половой бурсы расположен сферический семенной пузырек, обычно заполненный большим количеством спермы. Простатическая часть хорошо выражена. Она обладает толстыми стенками с большим количеством железистых клеток. За ней следует выворачивающийся отдел мужского копулятивного органа — короткий циррус. Яичник расположен рядом или несколько кпереди от переднего семенника. Его передний конец граничит с задним краем брюшной присоски. Форма яичника близка к сферической; его диаметр 0,07—0,12 мм. Желточники развиты очень сильно. Их многочисленные фолликулы расположены справа и слева на всем протяжении тела, начиная от ротовой присоски и почти до самого заднего конца. Фолликулы желточников лежат в периферических частях паренхимы как со спинной стороны, так и с боков и с брюшной стороны, как это видно на поперечных срезах. Два желточных протока подходят (справа и слева) к яичнику, несколько отступя от заднего края брюшной присоски. Семяприемник грушевидной формы. Он расположен непосредственно над яичником, благодаря чему на тотальных препаратах его обычно обнаружить не удается. Он хорошо виден на срезах. Лауреров канал имеется. Петли матки располагаются в области брюшной присоски и несколько кзади от нее, но никогда не заходят в заднюю половину тела. Вокруг начальных отделов матки расположено хорошо развитое тельце Мелиса. Дистальный отдел матки переходит в хорошо выраженный метратерм, расположенный на брюшной стороне сбоку и ведущий к половому отверстию, где и открывается наружу вместе с циррусом.

Количество яиц в матке всегда очень невелико: оно варьировало в пределах от 1 до 8. Среднее число яиц в матке, подсчитанное для 50 экземпля-



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LEPOCREADIIDAE

Spinoplagioporus niloticus (Vercammen-Grandjean, 1960) n.comb.

Famille **OPECOELIDAE** Y. Ozaki 1925 LEPOCREADIIDAE

Sous-famille **Plagioporinae** H. Manter 1947

Genre **PLAGIOPORUS** Stafford 1904 INCORRECT

L'espèce qui va être étudiée est typiquement un *Plagioporinae* H. Manter 1947. Néanmoins, elle offre des traits de ressemblance avec certaines espèces du genre *Crowcrocaecum* Skrjabin & Koval 1956, par son aspect général, la situation et la forme de sa poche du cirre, et par ses œufs gros et peu nombreux; cependant la jonction des diverticules coecaux n'existe pas. Sa spinulation intense et générale, la dimension extraordinaire des épines cuticulaires, ont fait songer au genre *Spinoplagioporus* Skrjabin & Koval 1958, qui convient aussi pour la forme et la situation de la poche du cirre. Mais, dans ce cas, c'est la disposition génitale qui ne cadre plus.

N. B. — Il y a lieu de noter que *Crowcrocaecum* Skrjabin & Koval 1956 = *Nicolla* Wisniewski 1933.

10. **Plagioporus niloticus** n. sp.

[Figures 162 à 166].

A. - Description.

a. - *Mesures*: Moyennes des deux spécimens assez semblables.

C		Vo		Ac		Ph		oE		Ov	Ta		Tp		Pc		Oe	
L	l	L	l	L	l	L	l	L	l	Ø	L	l	L	l	L	l	L	Ø
1230	420	166	160	204	224	72	61	134	20	100	100	204	132	200	160	84	92×66	

b. - *Morphologie*: Corps dont le rapport longueur/largeur est de 3 pour 1 et présente une constriction particulière lui faisant deux « épaules ». La ventouse orale — plus petite que la ventrale — est toute couverte d'épines. L'acétabulum est central, [162].

Système digestif: La ventouse orale a une membrane musculeuse externe qui se ferme en ne laissant qu'une fente longitudinale; elle est entièrement couverte d'épines épaisses [163]. La cavité orale communique avec un pharynx plus long que large. Celui-ci est suivi d'un œsophage relativement long (134 µ) qui se divise en deux coeca. Ceux-ci vont jusqu'à l'extrémité du corps et leur extrémité n'est pas soudée.

Système génital: *Mâle*: deux gros testicules, plus larges que longs sont disposés en tandem dans l'extrémité postérieure du corps. Leur « vas deferens » s'unissent un peu après l'ovaire en un canal de 220 µ de long. La poche du cirre, plutôt courte et épaisse, est contournée et entièrement anté-acétabulaire. L'orifice génital est central, entre la bifurcation coecale et l'acétabulum [162].

Femelle: L'ovaire est à droite. A l'ootype large viennent se joindre le réceptacle séminal et le vitelloducte central. Il y a un canal de Laurer avec un orifice bien visible. L'utérus, large et court, forme une seule boucle avant de remonter vers l'atrium génital. On compte 6 ou 8 œufs utérins. Ceux-ci mesurent entre 90 et 94 µ de long pour 65 à 68 µ de large.

Lorsque les œufs sont pondus, ils ont quatre blastomères [162].

Système excréteur: f (Cf) = 2[(2+2) + (2+2)] = 16. Le schéma excréteur a pu être observé sur un spécimen sacrifié [162']. L'orifice excréteur est subterminal et *dorsal*.

Système nerveux: Une bandelette nerveuse, dorsale à l'œsophage, est bien visible [162].

Chaetotaxie: Tout le corps est recouvert de fortes et larges épines, sauf dans la région centrodorsale: [164]. Les épines antérieures sont larges et plus trapues que les postérieures, lesquelles sont plus longues et minces [165, 166]. A certains endroits du dos, elles présentent un crochet apical [165']. La spinulation autour de l'orifice excréteur est remarquable [164]. L'acétabulum n'est pas spinulé.

B. - Hôte et Distribution.

Trois exemplaires de cette espèce furent trouvés dans l'intestin d'un *Tilapia nilotica* du Lac Kivu, le 15 octobre 1950. L'un d'eux fut sacrifié à l'étude sur le vivant, et perdu par écrasement.

IX. FURCOCERCA

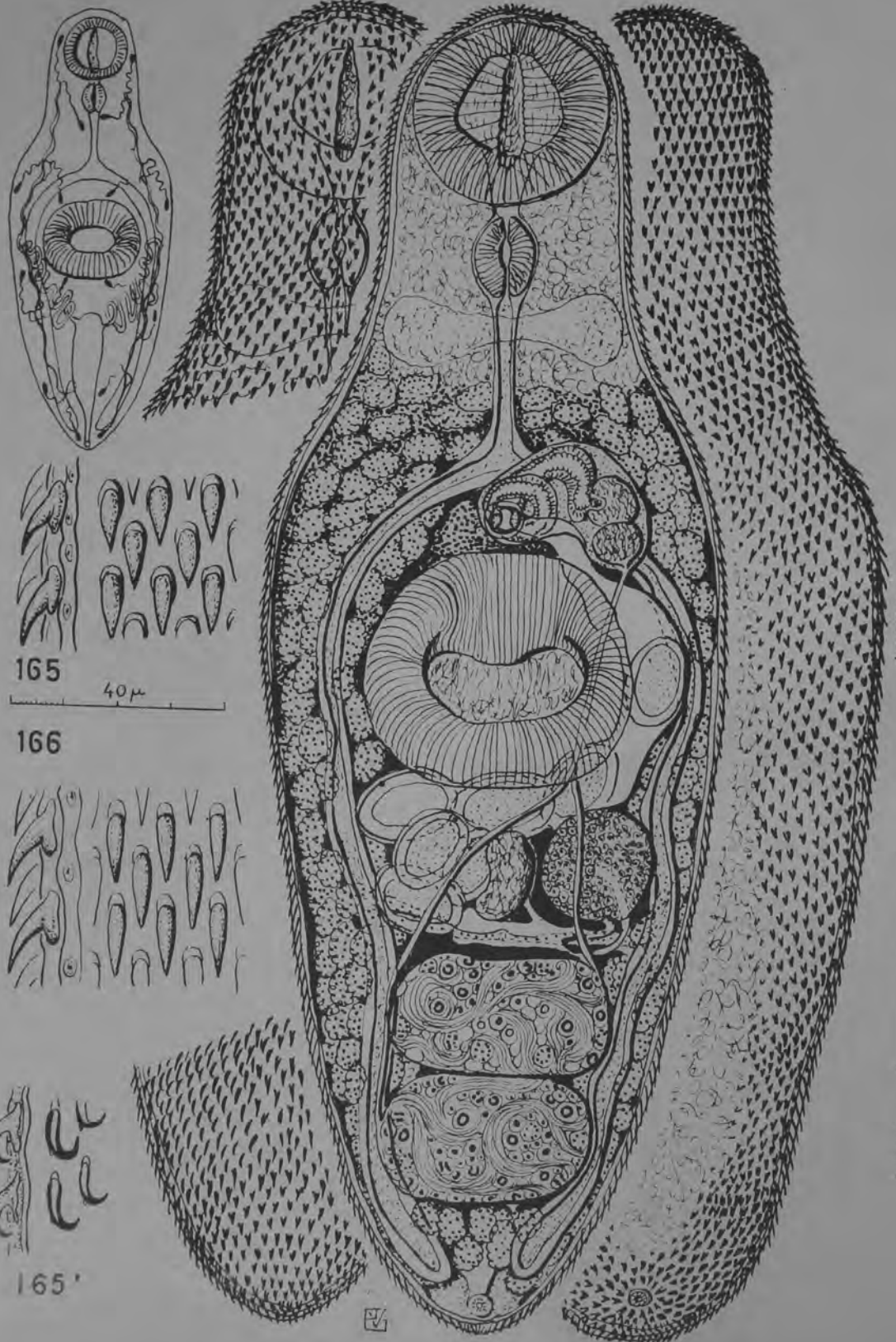
A. Fain (1953) dit de ce groupe qu'il est « extrêmement complexe et très peu homogène » et c'est exact.

On a défini très brièvement ces cercaires par la présence d'une « *queue bifurquée à son apex* ».

Dans son travail, A. Porter (1938) donne un aperçu de l'histoire des furcocercaires dont la première relation, par O. F. Müller, date de 1773. Un nombre important de chercheurs collaborèrent à la connaissance de ces larves.

Sur le plan de l'intérêt médical, la connaissance du distome responsable de la Schistosomiase remonte à 1851, lorsque au cours d'une autopsie T. Bilharz découvrit ce ver dans les veines mésentériques d'un habitant du Caire.

Il l'appela *Distomum haematobium*. Cependant, le genre *Distomum* ne pouvant donner asile à *haematobium*: Weinland (1858) lui attribua donc le nom de *Schistosoma*.


162'
163
162
164
165
40μ
166
1000μ
165'

SPINOPLAGIOPORUS

Stegodexamene Macfarlane, 1951

Generic diagnosis. — Allocreadiidae, Allocreadiinae: Body small, cylindrical, spinose, with well developed cuticular glands and rudiments of larval eye spots. Suckers small, nearly equal in size. Prepharynx very short, esophagus narrow and long, ceca narrow, extending to posterior extremity. Testes round, oblique, toward midbody. Cirrus pouch claviform, mainly postacetabular, containing bipartite seminal vesicle, well developed prostatic complex and muscular cirrus. Genital pore preacetabular, slightly to left of median line. Ovary round, pretesticular, to right of median line. Receptaculum seminis present. Vitellaria extending from ovarian level to posterior extremity. Uterus pre-ovarian, intercecal; metraterm muscular; eggs not filamented, fairly large. Excretory vesicle long, tubular, reaching to bifurco-acetabular zone. Parasitic in freshwater fishes.

Genotype: *S. anguillae* Macfarlane, 1951 (Pl. 32, Fig. ~~421~~ 412), in *Anguilla dieffenbachii* and *A. australis schmidtii;* New Zealand.

Cercaria oculate, with four pairs of penetration glands and setiferous tail, develops in *Potamopyrgus antipodum* and *P. badia*, encysts in *Gobiomorphus gobioides*. Progenetic production of eggs and spermatozoa occur in metacercariae.

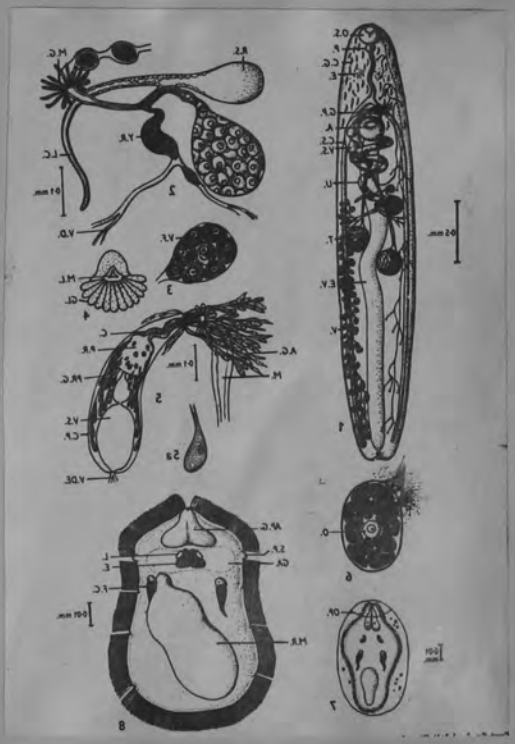
Lepocreadiidae

STEGODEXAMENE Macfarlane,1951

Small spinous fresh-water parasites. Cylindrical. Suckers nearly equal in size. Prepharynx very short,esophagus long and narrow. Ceca narrow,extending to posterior end. Testes spherical and oblique in position. Cirrus sac covering constricted seminal vesicle, and pars prostatica well developed. Excretory vesicle saccular, extending to acetabulum/. Ovary spheroidal and right pretesticular. Uterus preovarian, and intercecal metraterm muscular with hyaline bodies at termination. Common genital pore opening slightly to left of acetabulum. Vitellaria lateral, extending from the ovarian level to the posterior end. Eggs 10 to 30, fairly large, operculate. Cercaria trichocercous.

Type species: S.anguillae Macfarlane,1951

from Anguilla in New Zealand



STEGODEXAMENE

Thysanopharynx Manter, 1933

Generic diagnosis. — Megaperidae: Body fairly small, elongate, spined, with ends only slightly tapering. Oral sucker slightly larger than acetabulum, almost wholly enclosed in fold of body wall. Prepharynx wide; pharynx large, with anterior edge divided into finger-like processes. Esophagus practically absent. Ceca wide, opening at posterior extremity. Acetabulum rather small, in anterior half of body. Testes of rather irregular shape, placed symmetrically in front of acetabulum ventral to ceca. Seminal vesicle dorsal to acetabulum. Genital pore just in front of acetabulum. Ovary median, unlobed, just posterior to acetabulum. Receptaculum seminis large. Vitellaria extending almost whole length of hindbody, confluent in median field. Uterus short; eggs large, thin-shelled. Excretory vesicle extending to ovary. Intestinal parasites of marine fishes.

Genotype: *T. elongatus* Manter, 1933 (Pl. 15, Fig. 186), in *Lactophrys tricornis;* Florida.

THYSANOPHARYNX new genus

Manter, 1933

Fairly small, elongate distomes, with spiny cuticula and with ends only slightly tapering. Oral sucker slightly larger than ventral sucker, almost wholly enclosed in a fold of the body wall. Ventral sucker at about the end of first body third. Broad prepharynx, anterior edge of pharynx divided into finger-like processes; no true esophagus but a short common stem to the ceca; ceca broad, two ani at posterior end of body. Testes of rather irregular shape; mostly anterior to the ventral sucker, ventral to the ceca; seminal vesicle dorsal to the ventral sucker; cirrus and cirrus sac lacking. Ovary globular, unlobed, median, just posterior to the ventral sucker; Mehlis' gland well developed, large seminal receptacle; Laurer's canal present; vitellaria posterior to ventral sucker. Short uterus, short metraterm, short genital atrium; large, thin-shelled eggs. Excretory system a simple vesicle extending to ovary, receiving two lateral excretory vessels. Type species: *T. elongatus*.

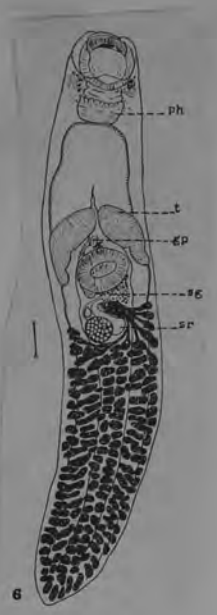
The name Thysanopharynx is from *thysan*, fringe, and *pharynx*, and refers to the fringed pharynx.

Thysanopharynx elongatus n. sp.
(Figs. 6-9) Manter, 1933

Host: *Lactophrys quadricornis* (Linn.), cowfish or trunkfish.

Incidence: Present in nine of twenty-eight hosts examined.

Body flattened, elongate, rather delicate and non-muscular, almost equally broad throughout most of its length, tapering somewhat toward the posterior end, length 1.4 to 1.9 mm., width 0.29 to 0.35 mm. The cuticula in the anterior half of the body is covered with spines which become inconspicuous posteriorly and disappear a short distance from the posterior end. In some specimens the spines reappear at the extreme posterior tip near the excretory pore. Traces of eye-spots occur dorsally near the anterior end. The oral sucker is subterminal, embedded in the body, and surrounded by a thin fold of the body wall. This hood-like encircling fold in at least one case seemed to contain a band of circular muscles (Fig. 9). The ventral sucker is slightly smaller than the oral sucker and is located at about the end of the first body third. Its aperture is round or oval. There is a broad prepharynx with very thin walls. The pharynx is cup-shaped, weakly muscular, with anterior border divided into a ring of finger-like lobes from eleven to fifteen in number. The lobes may be more than half the length of the pharynx. In extended specimens there seems to be an esophagus which has, however, exactly the same structure as the ceca. The ceca are broad and extend to the posterior tip where each opens to the outside. The ani occur close to the excretory pore, one on each side (Fig. 8).



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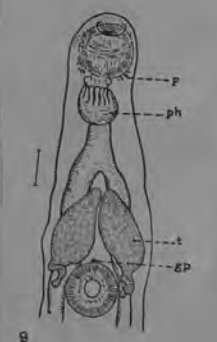
The genital pore is median at the anterior edge of the ventral sucker. There is a short tubular genital sinus with rather thick walls surrounded by gland cells. It almost at once divides into the metraterm (which is of similar structure) and the thin-walled seminal vesicle. A cirrus sac is lacking. The elongate-oval seminal vesicle extends dorsally to the posterior border of the ventral sucker or slightly beyond. The testes are large, symmetrical, lateral, ventral to the ceca, mostly anterior to the ventral sucker. They are broader anteriorly where they come close together medianly; posteriorly they curve around the ventral sucker on each side, their posterior ends often abruptly narrowed and curved or twisted. (Fig. 9). The ovary is globular, unlobed, more or less median, intercecal, a short distance posterior to the ventral sucker. The uterus is very short. One 1.82 mm. specimen contained one egg, another, 1.45 mm. in length, contained eight eggs which seemed to fill the uterus completely. At the anterior border of the ovary is a large flask-shaped seminal receptacle lying mostly to the left of the ovary but overlapping it dorsally. Laurer's canal is present. The vitellaria consist of large follicles distributed ventrally across the entire body from about the level of the ovary to the posterior tip. They occur medianly and laterally to the ceca but not dorsally. The yolk reservoir is in the form of a swollen region of the yolk duct. The eggs are large, thin-shelled, almost colorless, 56 to 66 by 32 to 39μ.


7

8

The excretory pore is slightly dorsal near the posterior tip of the body. The single excretory vesicle extends forward to the posterior edge of the ovary. Two minute lateral collecting tubules open into it at this point. These two lateral tubules can be traced in cross-sections as far forward as the pharynx.



9

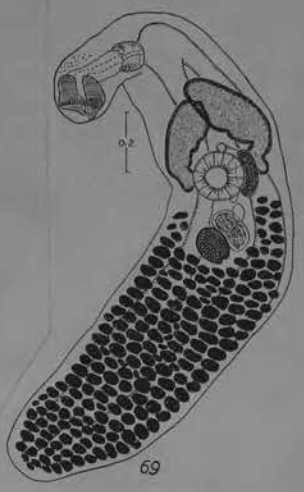
MEASUREMENTS

Length	1.450 mm.	1.570 mm.	1.740 mm.	1.820 mm.	1.900 mm.
Width	0.356	0.290	0.356	0.315	0.290
Oral sucker	0.180	0.173	0.180	0.170	0.160
Ventral sucker	0.160	0.148	0.136	0.150	0.138
Forebody	0.374		0.597	0.688	0.610
Eggs	66 by 32μ			56 by 39μ	
	56 by 32μ				
	60 by 32μ				

Thysanopharynx elongatus Manter, 1933 (FIGURE 69)

Host: *Lactophrys tricornis*.
Site: intestine.
Locality: off Puerto Real, P. R.

from Siddiqi and Cable, 1960



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FAMILY MEGAPERIDAE Manter, 1934

Thysanopharynx elongatus Manter, 1933
Host: Lactophrys bicaudalis (C).
Site: intestine.

Nahhas & Cable, 1964

Thysanopharynx elongatus Manter, 1933

Host: Lactophrys quadricornis (1 of 3).
Site: Intestine.

Discussion: Manter (1963a:107) reduced the family Megaperidae Manter, 1934, which would include this and the following species, to a subfamily in the Lepocreadiidae. Nahhas and Cable (1964:179) tentatively accepted Megaperidae and placed it in the superfamily Haploporoidea Mehra, 1961, along with the haploporids and haplosplanchnids. They also noted that *Enenterum* and *Cadenatella,* generally placed in the Lepocreadiidae, have features in common with members of the Haploporoidea and that they might later be transferred to that group. Pending life history studies, however, they retained the two genera in the Lepocreadiidae. I also prefer to retain them, as well as *Thysanopharynx* and *Megapera,* with the lepocreadiids.

from Overstreet, 1969

THYSANOPHARYNX

Lepocreadiidae

TRANSVERSOCREADIUM Hafeezullah, 1970 in Parasitology

Diagnosis of Transversocreadium: Body much wider than long. Cuticle spines probably present. Acetabulum spherical. Oral sucker subterminal. Prepharynx indistinct; pharynx, oesophagus present; caeca arcuate. Testes 11, in two groups on either side of acetabulum. Cirrus sac with internal seminal vesicle, prostatic complex and cirrus. External seminal vesicle present. Genital pore marginal, near oral sucker. Ovary lobed. Seminal receptacle present. Uterus scanty; metraterm present. Excretory vesicle tubular. Type and only species: *Transversocreadium cablei*.

Remarks

Transversocreadium is similar to *Multitestis* Manter, 1931, particularly *M. rotundus* Sparks, 1954, and *Rhagorchis* Manter, 1931, in the number of testes but differs from them in having a much wider than long body, horizontally arranged testes, marginal genital pore near oral sucker and distinctly sinistral ovary.

Transversocreadium cablei gen.nov. et sp.nov. (Fig. 4) Hafeezullah, 1970

Host: *Triacanthus brevirostris* Schlegel; short-nosed tripod fish; Triacanthidae

Site: intestine

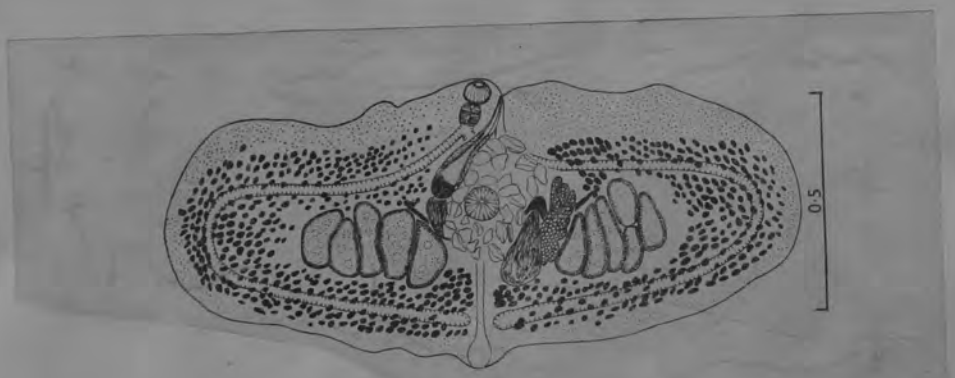
Number of specimens: 5

Locality: Calicut

Description (based on material reconstructed from broken specimens; with measurements on three): Body 0·47–0·65 mm long, 1·12–1·58 mm wide, transversely elongated. Cuticle spines probably lost in processing. Acetabulum 59–68 in diameter, spherical, feeble, in centre of body. Oral sucker, 51–68 in diameter, subterminal, feeble. Sucker ratio 1:1·13–1·24. Prepharynx indistinct; pharynx 44–53 in diameter; oesophagus short; caeca arcuate, ending blindly near posterior end of body.

Testes 116–175 by 59–96, 11, arranged horizontally, five on right and six on left side of acetabulum. Cirrus sac club-shaped, disposed obliquely from right to left, extending posteriorly to about mid-level of acetabulum, enclosing internal seminal vesicle in swollen base, prostatic complex in tubular distal part. External seminal vesicle present. Genital pore marginal, in notch left of oral sucker.

Ovary deeply multilobed, anterosinistral, sinistral or posterosinistral to acetabulum. Seminal receptacle large, saccular, near ovary. Vitellaria follicular, disposed along course of caeca. Uterus scanty, from level of caecal bifurcation to slightly posterior to acetabulum; metraterm present. Eggs collapsed, measuring 41–62 by 27–41. Excretory vesicle tubular; excretory pore terminal. The species is named after Dr R. M. Cable.



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***Transversocreadium cablei* Hafeezullah, 1970**

Host: *Triacanthus brevirostris* (Schlegel) (Triacanthidae).

Location: Intestine.

Number: 18 from 3 of 13 hosts.

Waltair Coast. Bay of Bengal

Remarks

Eighteen specimens are in general agreement with the original description based on broken bits of five specimens from the same host from Calicut. They confirm the original description and additionally indicate that the long I-shaped excretory bladder extends anterior to acetabulum.

from ~~Mat~~ Madhavi, 1972

TRANSVERSOCREADIUM