1990

Binder 092, Hemiuridae Dinurinae A-E [Trematoda Taxon Notebooks]

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Dinurinae Looss 1907

Medium-sized to small, very muscular forms with well-developed abdomen. Skin of the fore-body cross-ringed. Oral sucker overlapped by a clear lip. Fork of the excretory bladder between testes and ventral sucker; branches of the bledder not uniting in the fore-body but end blindly beside the oral sucker after giving off backward coursing vessels. Genital pore close behind the mouth edge. Genital atrium relatively long, cirrus sac as in Hemiurinae, pars prostatica equal long tube-like; seminal vesicle consisting of three parts following one another and separated by three not very deep constrictions. Vitellaria composed of separate, clearly individual tubes.

Dinurinae Looss, 1907

Subfamily diagnosis. — Hemiuridae: Body elongate, with tail broadest at ovario-vitellarian zone. Acetabulum strongly developed, near anterior extremity or well apart from it. Testes usually postacetabular, sometimes far back of acetabulum. Seminal vesicle saccular or tubular, divided or not, with thin or thick muscular walls, largely or entirely post-acetabular. Pars prostatica long or short, prostate cells surrounding whole length or part of pars prostatica or limited to distal portion of duct connecting seminal vesicle with hermaphroditic duct. Ductus hermaphroditicus long or short, enclosed in pouch or not. Genital atrium usually well developed. Ovary unlobed, posttesticular. Vitellarian lobes long, narrow, winding, occasionally thick and not winding. Uterus extending posterior to vitellaria. Excretory arms uniting anteriorly.

Key to genera of Dinurinae

1. Postacetabular region unusually long and attenuated; pars prostatica extremely long, provided with prostate cells at its two extremities; ductus hermaphroditicus short, enclosed in muscular pouch ..... *Mecoderus*
   Postacetabular region not unusually attenuated 2
2. Prostate cells surrounding whole length of pars prostatica 3
   Prostate cells limited to distal portion of duct connecting seminal vesicle and hermaphroditic duct 5
   Prostate cells and pars prostatica not distinctly differentiated; ductus hermaphroditicus long, muscular, without pouch ..... *Johniophyllum*
3. Ductus hermaphroditicus long, pars prostatica long and winding; seminal vesicle usually with thick muscular wall ..... *Lecithocladium*
   Ductus hermaphroditicus short; pars prostatica straight; seminal vesicle tubular, thin-walled ..... *Tubulovesicula*
   Ductus hermaphroditicus long; pars prostatica entirely postacetabular; seminal vesicle thin-walled, divided or not 4
4. Ductus hermaphroditicus convoluted anteriorly; vitellarian lobes rather thick, not winding ..... *Elytrophallus*
   Ductus hermaphroditicus not convoluted anteriorly; vitellarian lobes long, narrow, winding ..... *Dinurus*
5. Ductus hermaphroditicus enclosed in pouch 6
   Ductus hermaphroditicus thick-walled, not enclosed in pouch ..... *Magnacetabulum*
6. Uterus forming more or less conspicuous saccular dilatation just before opening into hermaphroditic duct; acetabulum in middle third of body ..... *Uterovesiculurus*
   Uterus not forming such dilatation, acetabulum near anterior extremity ..... *Ectenurus*

~~Subfamily Elytrophallinae Skrjabin & Guschanskaja, 1954~~

~~This~~ A group was named as a family by Skrjabin & Guschanskaja in 1954. I am considering it as a subfamily of Hemiuridae with the following diagnosis:

Hemiurids with ecsoma, with or without plications; vitellaria of seven lobes or tubes; seminal receptacle lacking; sinus sac enclosing a tubular ♂ organ, the hermaphroditic tube, lying free in the sinus sac and protrusible into genital atrium; seminal vesicle not distinctly trilobed. Type genus ELYTROPHALLUS Manter, 1940 . Other genera: ERILEPTURUS Woolcock, 1935; ELYTROPHALLOIDES Szidat, 1935; GLOMERICIRRUS Yamaguti, 1937.

The genus Lampritrema Yamaguti, 1940 is probably related. Its family, Lampritrematidae Yamaguti, 1940, depends on the descriptions of the uterus entering the sinus sac rather than the tubular organ which would therefore be male rather than hermaphroditic. This point is difficult to determine even from sections.

The genera Dinurus and Ectenurus have the ♂ tube and are closely related

For this reason the above subfamily is not recognized and these genera are included in the Dinurinae

Dinurus Looss, 1907

Generic diagnosis. — Hemiuridae, Dinurinae: Body cylindrical, with long tail. Oral sucker subterminal, comparatively large, pharynx subglobular, esophagus short, ceca long, reaching to posterior extremity. Acetabulum prominent, large, close to oral sucker. Testes one on each side behind acetabulum. Vesicula seminalis pretesticular, constricted into three or four portions. Pars prostatica narrow, winding. Hermaphroditic duct with sheath-like pouch, opening into genital atrium. Genital pore ventral to oral sucker. Ovary posttesticular. Vitellaria consisting of seven long narrow winding tubules. Uterus descending into tail. Excretory arms uniting dorsal to oral sucker. Stomach parasites of marine fishes.

Genotype: *D. tornatus* (Rud., 1819) Looss, 1907 (Pl. 24, Fig. 315), in *Coryphaena equisetis, C. hippurus, Peprilus paru;* Atlantic. Metacercaria found in pelagic crustacea such as *Cerataspis* — Dollfus (1927).

Other species:

D. barbatus (Cohn, 1902) Looss, 1907, in *Coryphaena equisetis, C. hippurus, Pelamys sarda;* also in *Coryphaena hippurus* from Secas Isl., Panama.

D. breviductus Looss, 1907, in *Pelamys sarda;* Atlantic. Also in *Coryphaena hippurus;* Beaufort, N.C. Causal agent of "enfermedad de las manchas negras" of *Clupea melanostoma* in Argentina.

D. coryphaenae Yamaguti, 1934, syn. of *D. longisinus* Looss, 1907 — Manter (1947), in *Coryphaena hippurus;* Pacific coast, Inland Sea, Toyama Bay, and also in *Seriola aureovittata;* Toyama Bay, Japan.

D. euthynni Yamaguti, 1934, in *Euthynnus pelamys;* Pacific coast, Japan.

D. longisinus Looss, 1907, in *Coryphaena hippurus;* Red Sea near Aden, Secas Isl., Panama.

D. scombri Yamaguti, 1934, in *Scomber japonicus*, Toyama Bay, Japan. Also in *Euthynnus alletteratus;* Florida.

DINURUS Looss 1907

Medium-sized, muscular froms with well-developed abdomen. Pars prostatica long and winding, connecting duct with the very short seminal vesicle not supplied with gland cells. Tubes of the vitellaria very long and much coiled.

Type species: Dinurus tornatus (Rud.)

See Dubois, Georges 1932 -
Rev. suisse zool., 40: 5-8.

Ex. crura not uniting.

Dinurus barbatus (Cohn, 1903) Looss, 1907
D. coryphaenae Yam., 1934
D. breviductus Looss, 1907
D. euthynni Yamaguti, 1934
D. longisinus Looss, 1907
D. magnus Manter, 1928 — to Stomachicola
D. nanaimoensis McFarlane, 1935 to Tubulovesicula
D. scombri Yamaguti, 1934
D. pingris Linton, 1940 — to Tubulovesicula
D. rubens Linton, 1910 — to Stomachicola

Table of species of DINURUS as arranged by Dollfus (1927) emended by Manter from the data of Looss (1907).

A. Species in which the diameter of the oral sucker is clearly greater than half the diameter of the ventral sucker

Aa No cuticular elongations between the two suckers

Transverse annulations of the soma cuticula begin dorsally about at the level of the posterior border of the ventral sucker.

Oral sucker definitely smaller than the acetabulum. Cirrus sac long and (the penis being retracted) extending in general over the entire depth of the ventral sucker, genital atrium extending from the level of the anterior border of the ventral sucker to the lower border of the opening of the oral sucker. . . .
.....D. tornatus (Rud. 1819)

Transverse annulations of the soma cuticula begin about at the level of the anterior border of the oral sucker. Suckers about the same size.

Tail twice length of body....D. euthynni Yamaguti, 1934

Tail not longer than body....D. scombri Yamaguti, 1934

Ab Cuticular finger-like extensions between the two suckers

Transverse annulations of the soma cuticula beginning dorsally and graduàlly near the level of the anterior border of the oral sucker. Cirrus sac very short (penis being retracted) being completely or almost completely in front of the level of the anterior border of the ventral sucker; genital atrium being visibly as short as the cirrus sac.
....D. barbatus (Cohn, 1903)

B. Species in which the diameter of the oral sucker is about half that of the ventral sucker, the transverse annulation of the soma cuticula beginning almost immediately behind the dorsal border of the oral sucker. No cuticular elongation between the suckers.

Ba Cirrus sac small, its base being anterior to the anterior border of the ventral sucker; the genital atrium being much shorter than the cirrus sac.....
.....D. breviductus Looss, 1907

Bb Cirrus sac reaching or even passing posterior to the level of the middle of the ventral sucker (length intermediate between that of breviductus and tornatus), genital atrium being equal or slightly shorter than the sac, but reaching posteriorly the level of the anterior border of the ventral sucker.....

Eggs 17-19 by 11-13.....D. longisinus Looss, 1907
Eggs 21-24 by 12-13.....D. coryphaenae Yamaguti, 1934

Dinurus tornatus (Rud. 1819)

Length varies according to contraction and age. A specimen not completely fully grown measured 3.7 mm. with abdomen withdrawn, swollen posteriorly where it had a diameter of 1.2 mm. Soma with abdomen extended, 2.-4.5 mm. long. Oral sucker 0.5 - 0.7 mm., Ventral sucker 0.6-0.8 mm. The ringing of the cuticula begins dorsally near the posterior border of the ventral sucker or a little in front of this point. From the oral sucker to this point the skin is smooth and only in young specimens can a faint striations be seen here. Ductus hermaphroditus and cirrus sac of similar length, the former in extended specimens reaching to the anterior border of the ventral sucker, the latter over-reaching the ventral sucker a short distance. The extended cirrus is armed with very fine numerous spines. Eggs: 18-20 by 12-15u

Hosts: Coryphaena equisetis
Coryphaena hippuris

From Atlantic Ocean: Coryphaena hippuris At Beaufort
Pelamys sarda

10. *Dinurus tornatus* (Rudolphi, 1899) Looss, 1907
(Figs. 23 to 24)

Host: *Coryphaena equisetis* ? Linn.; small dolphin; family Coryphaenidae
Incidence of Infection: In 3 of 3 hosts
Numbers: Not counted
Location: Stomach
Locality: Gulf of Mexico, 15 miles west of Pass-a-Grille, Florida

Discussion: The specific identity of the host is in question. All three hosts were collected from a single school of small dolphins.

Manter (1947) reported *D. tornatus* from *Coryphaena hippurus* in Tortugas, Florida, and Linton (1905) from *Coryphaena hippurus* and *C. equisetis* in Beaufort, North Carolina. Ward (1954) reported "*D. tornatus*" from the Miami, Florida area. She followed Dawes (1947) in considering *D. longisinus* Looss, 1907, a synonym of *D. tornatus*. The species Ward (1954) pictures (Fig. 3) may be *D. longisinus* because the hermaphroditic duct extends to the middle of the acetabulum. Dawes (1947) considers *Dinurus barbatus* (Cohn, 1903) Looss, 1907, *D. breviductus* Looss, 1907, *D. longisinus* Looss, 1907, synonyms of *D. tornatus* (Rudolphi, 1899) Looss, 1907. One of us (F.S.) has *Dinurus* spp. collected from *Coryphaena hippurus* in the Gulf of Panama and in Bimini, B.W.I., and in addition has been privileged to study Professor Manter's series of *Dinurus* spp. from *Coryphaena hippurus* collected in Tortugas, Florida and the Tropical American Pacific. *Dinurus tornatus* may be easily separated from *D. longisinus* because the cuticle in the former species is denticulated to the acetabulum (Figs. 23 to 24) and the hermaphroditic duct extends almost to or beyond the posterior border of the acetabulum, as compared with cuticular denticulations extending to the oral sucker and hermaphroditic duct extending to about the middle of the acetabulum in *D. longisinus*. These differences appear to be constant in several hundred specimens which one of us (F.S.) has been able to observe. The fact that most *Dinurus* spp. may live together in a single host is not evidence enough for synonymy of the species as presented by Dawes (1947). There are numerous examples to indicate that closely related species and genera may cohabit in the same host. The finding of closely related species living together in one host would imply a strong degree of host specificity accompanying evolution. Manter (1957) shows how the accacoelid trematodes of *Mola mola* are a good example of such evolution. There is no definite contrary evidence to show that hermaphroditism is the rule in the Digenea. There is some evidence that cross fertilization occurs, and it may be more common than we at present suspect or assume. The differences of the cuticular denticulations of *Dinurus tornatus* and *D. longisinus* could possibly be a recognition character preventing interspecific mating if cross fertilization occurs in this group of trematodes. Thus in trematodes in which weak recognition characters preventing interspecific matings would exist, hybrids would be expected to result. *Pseudocreadium myohelicatum* (Bravo & Manter, 1957) seems to be just such a hybrid example (*Pseudocreadium scaphosomum* Manter, 1940 X *Pseudocreadium spinosum* Manter, 1940). Such a hybridization may perhaps occur when two trematode species normally occur in separate host species and sometimes are accidentally in one host species together. Recognition characters preventing interspecific matings


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in these instances would possibly be weaker than when both species normally occur together in one host species as is the case in the *Dinurus* spp. in *Coryphaena* spp., in the *monorchiids* from *Haemulon* spp., and in the accacoelids from *Mola mola*. Price (1953) believed hybridization between *Faciola hepatica* and *F. gigantica* existed in cattle in the Southeastern United States. If trematode hybrids exist these would probably be confused with intergradation between two closely related species by most observers. Such may be the case in some *Dinurus* spp. confused as synonyms by some investigators.

from Sogandares & Hutton, 1959

0146

Dinurus tornatus (Rudolphi, 1819) Looss, 1907 (FIGURE 137)

Synonyms:
Distomum tornatum Rudolphi, 1819.
Lecithocladium tornatum (Rudolphi) Lühe, 1901.
Host: *Coryphaena hippurus*.
Site: stomach.
Locality: Mona Island, P. R.
Deposited specimen: No. 39406.

from Siddiqi + Cable, 1960

Dinurus tornatus (Rud., 1895) Looss, 1907
Host.—*Coryphaena hippurus* Linn., dolphin.

Location.—Stomach.
Locality.—One host from Lerner fish pens, N. Bimini, B.W.I. [new locality record].
Discussion.—This species was not collected by me in Panama, but was found among specimens of *D. longisinus* collected and reported by Manter (1940a). *D. tornatus* may be separated from *D. longisinus* in that the cuticular annulations begin dorsally about level with the posterior border of the acetabulum, and the hermaphroditic duct extends past posterior border of acetabulum. *D. longisinus* differs by having transverse annulations of the soma cuticula beginning dorsal to oral sucker and the hermaphroditic duct never extends posterior to the acetabulum. Approximately 200 specimens of *D. longisinus* from five hosts in Panama Bay indicate that these are constant characteristics of this species. *D. tornatus* has been reported from the Red Sea, Massachusetts, Tortugas, and the South Atlantic.

Sogandares, 1959

Dinurus tornatus (Rudolphi, 1819)
Looss, 1907
Synonyms: Distomum tornatum Rudolphi, 819; *Lecithocladium tornatum* (Rud.) ühe, 1901.
Host: Coryphaena hippurus (C).
Site: stomach.

Curaçao; From Nahhas + Cable, 1964

Dinurus tornatus (Rudolphi, 1819) Looss, 1907

SYNONYMS: *Distomum tornatum* Rud., 1819; *Lecithocladium tornatum* (Rud.) Lühe, 1901.
HOST: *Coryphaena hippurus*.
HABITAT: Stomach.
LOCALITY: Tema, Ghana.
SPECIMEN DEPOSITED: USNM Helm. Coll. No. 71686.
DISCUSSION: This species has been recovered from *C. hippurus*, *C. equisetis*, *Sarda sarda*, and *Peprilus paru* (L.) (Stromateidae) from the European and U. S. Atlantic, Azores, Gulf of Mexico, Bimini, Puerto Rico, Cuba, Curaçao, Red Sea, and Gulf of Aden. All three species of *Dinurus* Looss, 1907, listed herein were from the same individual dolphin.

From Fischthal and Thomas, 1971

Erilepturus africanus, ♀ (Fig. 8-9) **Fischthal and Kuntz, 1963**

to Dinurus

Syn D. gigae F. & K., 1963

DIAGNOSIS (based on 2 specimens from two hosts): Leiothaliinae. Body smooth, elongate, with cesoma; body proper, length 1.710-1.760, width (at testes) 0.260-0.305; cesoma 0.450-0.640 × 0.195-0.285; total length 2.210-2.350, maximum width 0.315-0.405; distance from posterior margin of acetabulum to cesoma 1.110-1.175. Oral sucker globular, 0.097-0.143 × 0.093-0.131; preoral lobe 0.007-0.018. Acetabulum globular, 0.270-0.335 × 0.270-0.325; approximately one-fourth length of body proper from anterior end, one-fifth total length. Ratio of lengths of suckers 1:2.34-2.78. Pharynx globular, 0.055-0.085 × 0.058-0.073. Esophagus short, sac-like. Ceca not ascending sides of pharynx, extending into cesoma approximately one-half length of latter. Excretory pore terminal; median vesicle ascending cesoma.

Testes diagonal, slightly separated to overlapping, anterior testis 0.090-0.104 × 0.085-0.111, posterior testis 0.109-0.114 × 0.121-0.133; distance from posterior margin of acetabulum to anterior testis 0.121-0.138, to posterior testis 0.182-0.208. Vasa efferentia joining to form short vas deferens. Seminal vesicle starting 0.121-0.152 posterior to acetabulum, overlapping both anterior testis and acetabulum, relatively thin-walled, tripartite, chambers overlapping one another, in one specimen-posterior chamber 0.077 × 0.062, middle chamber 0.059 × 0.043, anterior chamber 0.044 × 0.031, longitudinal extent of complete vesicle 0.139. Pars prostatica long, relatively straight, starting at level of posterior portion of acetabulum; distal portion with prostatic gland cells commencing at antero-dorsal region of acetabulum. Hermaphroditic duct preacetabular, 0.077-0.085 × 0.010-0.015, formed by union of metraterm with pars prostatica at anterior extremity of prostatic gland cells and terminating at level of pharynx, enclosed in narrow, thin-walled sinus sac 0.015-0.020 in width; duct narrowing anteriorly and terminating in a bulbous, egg-shaped, muscular region, muscular bulb 0.029-0.039 × 0.022-0.024, projecting free into genital atrium. Genital atrium tubular, 0.048-0.058 × 0.010-0.012, leading to genital pore near postero-ventral margin of oral sucker.

Ovary 0.157-0.182 × 0.152-0.223, larger than either testis, median, post-testicular, separated from posterior testis by vitelline lobe and uterine fold, distance from posterior margin of acetabulum to ovary 0.325-0.346. Vitellaria of 7 tubular lobes, 4 right and 3 left, some lobes extending anteriorly overlapping posterior testis while remainder extending laterally and posteriorly, terminating well in advance of cesoma, ventral to ovary and posterior testis. Uterus much coiled, dorsal to vitellaria, ovary and testes, folds numerous posterior to vitellaria, descending into cesoma a short distance, ascending as straight duct dorsal to acetabulum, metraterm joining pars prostatica preacetabular to form hermaphroditic duct. Eggs numerous, 10 measuring 0.020 (0.018-0.021) × 0.013 (0.012-0.014).

HOST: *Pomadasys olivaceus* (Pomadasyidae).

HABITAT: Small intestine.

LOCALITY: Giza Fish Market, Giza Province, Egypt.

DATES: September 20 and October 12, 1952.

TYPE: U. S. Nat. Mus. Helm. Coll., No. 59683 (1 whole mount slide of type, and 1 whole mount slide of paratype).

Manter (1947) recognized the validity of the genera *Erilepturus* Woolcock, 1935 (without cuticular plications) and *Ectenurus* Looss, 1907 (with cuticular plications). In *Erilepturus* he included the type species *E. tiegsi* Woolcock, 1935, and *E. hamati* (syn. *Ectenurus h.* Yamaguti, 1934), *E. paralichthydis* (syn. *Ectenurus p.* Yamaguti, 1934), and *E. lemericensis* (syn. *Ectenurus* Tubangui and Masilungen, 1936). *Ectenurus* included the type species *E. lepidus* Looss, 1907, and *E. virgulus* Linton, 1910. Yamaguti (1954) listed *Erilepturus* as a synonym of *Ectenurus*, allocating to the latter the six species listed by Manter (1947) for both genera in addition to *Ectenurus platycephali* Yamaguti, 1934. Skrjabin and Guschanskaja (1951) recognized *Erilepturus*, but created the genus *Uteravesiculurus* for *U. hamati* (type), *U. paralichthydis*, and *U. platycephali* inasmuch as each possessed an uterine swelling immediately before the union with the pars prostatica. Yamaguti (1958) continued to list *Erilepturus* as a synonym of *Ectenurus*. He allocated to the latter *E. lepidus*, *E. lemericensis*, *E. tiegsi*, and *E. virgulus*, and recognized *Uteravesiculurus* and the three species contained therein. Manter and Pritchard (1960b) declared *Uteravesiculurus* a synonym of *Erilepturus*, transferring the three species contained therein to the latter genus.

From the foregoing account it appears that the genus *Erilepturus* contains five species: *E. tiegsi* (type), *E. hamati*, *E. lemericensis*, *E. paralichthydis*, and *E. platycephali*.

Erilepturus africanus appears to be most similar to *E. tiegsi*. It can be distinguished from the latter in being half as long, in the more anterior position of the acetabulum, in having the genital pore situated near the postero-ventral margin of the oral sucker rather than at the posterior edge of the pharynx, in the ceca extending into the cesoma approximately one-half the length of the latter rather than to its posterior extremity, and in the seminal vesicle being tripartite rather than bipartite.

From: Proc. Helm. Soc. Wash. 30: 88-89

Dinurus barbatus (Cohn 1903)

Somewhat smaller than D.tornatus. Length of largest specimen 7. mm. (9.5 mm. according to Cohn) by 0.4 -0.6 mm. thick. Suckers both powerful. Ventral sucker in grown sp cimens materially larger than oral sucker; average sizes: Oral sucker 0.45-0.55 Ventral sucker 0.63-0.7 mm. In young animals the oral sucker is relatively smaller. The lip overhaning the oral sucker is large; the ringing of the skin begins not far behind it. Characteristic for the species are a varying number of more or less long lobe-like thickenings of the cuticular betwwen the suckers ventrally and medianly. Their form and size varies in different individuals. Cirrus sac very small and relatively thick lying entirely in front of the ventral sucker. Atrium about as long as sucker. Eggs 20-22 by 15 µ

Hosts: Coryphaena hippuris
Pelamys sarda
Coryphaena equisetis

Dinurus barbatus (Cohn, 1903) Looss, 1907 (FIGURE 136)

Synonym:
Lecithocladium barbatum Cohn, 1903.
Host: *Coryphaena hippurus*.
Site: stomach.
Locality: Mona Island, P. R.
Deposited specimen: No. 39405.

from Sidaqi + Cable, 1960

Dinurus barbatus (Cohn, 1902)
Looss, 1907
Synonym: Lecithocladium barbatum Cohn, 1902.
Host: Coryphaena hippurus (C).
Site: stomach.

CURAÇAO; FROM NAHHAST CABLE, 1964

Dinurus barbatus (Cohn, 1903)
Looss, 1907

SYNONYM: *Lecithocladium barbatum* Cohn, 1903.

HOST: *Coryphaena hippurus* L., dolphin (Coryphaenidae).

HABITAT: Stomach.

LOCALITY: Tema, Ghana.

SPECIMENS DEPOSITED: USNM Helm. Coll. No. 71684.

DISCUSSION: This species has been reported from *C. hippurus*, *C. equisetis* L., *Sarda* (= *Pelamys*) *sarda* (Bloch) (Thunnidae), and *Paralabrax maculatofasciatus* (Steindachner) (Serranidae) from the European Atlantic, Gulf of Mexico, Puerto Rico, Cuba, Curaçao, and Mexican and Panama Pacific.

FROM FISCHTHAL AND THOMAS, 1971

21. *Dinurus barbatus* (Cohn, 1903).

Hospedador: *Paralabrax maculatofasciatus* (Steindachner).*
Localización: intestino.
Distribución geográfica: Bahía Magdalena, Baja California, México.

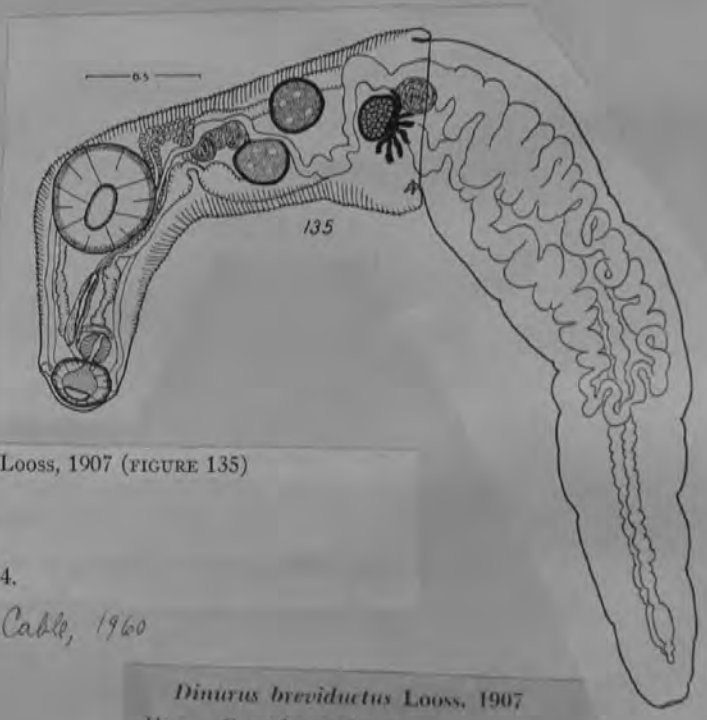
Otros hospedadores de *Dinurus barbatus* son: *Coryphaena equisetis*, *C. hippurus*, y *Pelamys sarda* (Yamaguti, 1958). Aunque Manter (1940) ha reportado *D. barbatus* y *D. tornatus* (Rud., 1819) en *Coryphaena hippuris*, yo me pregunto la validez de *D. barbatus* como especie distinta. La única diferencia obvia entre las dos especies es la presencia de unas estructuras que sobresalen de la superficie ventral, entre la ventosa oral y el acetábulo de *D. barbatus*. Otra diferencia posible es la que ofrece la longitud del aparato genital (el atrio genital y el conducto hermafrodita). En los especímenes presentes, parece que estos caracteres varían mucho, con el grado de contracción de la parte delantera del cuerpo del animal. Las "papilas", son variables en número, tamaño y forma en aquellos especímenes en que estas estructuras están presentes. Con respecto a lo demás, los diez y siete ejemplares de esta colección son idénticos. Aparentemente *D. barbatus* existe como variante de *D. tornatus*, pero no es posible hacer sinónimo a estas especies sin antes examinar especímenes representativos de otras colecciones.

From: Arai, H.P., 1962.

Dinurus breviductus Looss 1907

About the same size as D. barbatus Ventral sucker about twice as large as oral sucker).6 mm. as compared with 0.3 mm. Ringing of thr skin begins rather close behind the dorsal edge of the mouth Cirrus sac short, only a little longer than in D. b a rbatus and likewise relatively thick, its hind end overreaching the region of the anter or edge of th ventral sucker in none of Looss's specimens. Atrium always shorter than cirrus sac and usually only about ½ as long.
Host: Pelamys sarda
Coryphaena hippuris -----at Beaufort

Eggs 18-20 by 12-14μ



Dinurus breviductus Looss, 1907 (FIGURE 135)
Host: *Coryphaena hippurus*.
Site: intestine and stomach.
Locality: Mona Island, P. R.
Deposited specimen: No. 39404.

from Siddiqi + Cable, 1960

Dinurus breviductus Looss, 1907
Host: Coryphaena hippurus (C).
Site: stomach.

CURAÇAO; FROM NAHHAS + CABLE, 1964

Dinurus breviductus Looss, 1907
HOST: *Coryphaena hippurus*.
HABITAT: Stomach.
LOCALITY: Tema, Ghana.
SPECIMENS DEPOSITED: USNM Helm. Coll No. 71685.
DISCUSSION: This form has been found in *C. hippurus*, *C. equisetis*, *Sarda sarda*, and *Clupea melanostoma* (Clupeidae) from the European and U. S. Atlantic, Gulf of Mexico, Puerto Rico, Cuba, Curaçao, Argentina, and Red Sea.

FROM FISCHTHAL AND THOMAS, 1971

Dinurus breviductus Looss, 1907.

Host : *Coryphaena hippurus* L. (Coryphaenidae).
Site : Stomach.
Locality : Gorée, Senegal.
Date : 15 July 1954.
Specimen deposited : USNM Helm. Coll. No. 71884.

Discussion : This species has been reported from coryphaenid, thunnid and clupeid fishes from Ghana, European and U. S. Atlantic, Gulf of Mexico, Puerto Rico, Cuba, Curaçao, Argentina, and Red Sea. Our collection contains one adult worm.

From Fischthal AND THOMAS, 1972

Dinurus euthynni Yamaguti, 1934

Generic characters. Body 11 to 15 by 1. to 123, broadest at tail invagination. Tail very much longer than body proper. Cuticular denticulations conspicuous, confined to body proper. Oral sucker about 0.08 to 1. in diameter. Pharynx 0.34 in diameter. Acetabulum approximately as large as oral sucker and close to it. Testes oval, 0.29 to 0.45 long and 0.45 to 0.63 wide, closely oblique, behind middle of anterior third of body. Seminal vesicle constricted into four parts, just in front of anterior testis . Ductus hermaphroditicus beginning at level of anterior border of acetabulum. Ovary oval, 0.26 to 0.34 long by 0.44 to 0.49 wide, in posterior part of anterior third of body. Uterine coils extending some distance farther backwards than middle of body. Eggs oval, 15.8 to 18.4 by 10.5 μ.
Host: Stomach of Euthynnus pelayms (Linn.)
Locality: Japan, Pacific coast.

Differs from other species in:

1. Tail about twice as long as body proper.
2. Two suckers approximately equal in size.
3. Ductus hermaphroditicus is short and begins at about level of anterior border of acetab.
4. Uterus extends a short distance posterior to middle of whole body.

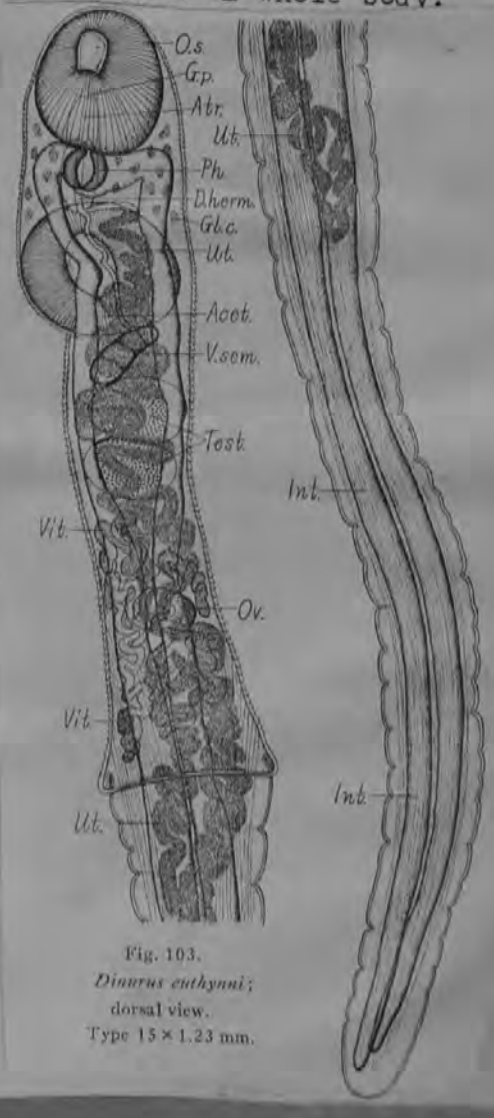
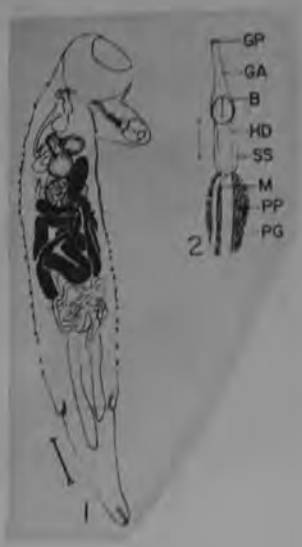


Fig. 103.
Dinurus euthynni;
dorsal view.
Type 15 × 1.23 mm.

Dinurus gizae, n. sp. (Fig. 1-2) Fischthal and Kuntz, 1963

Diagnosis (based on single specimen): Dinurinae. Body elongate, with ecsoma; body proper, length 1.889, width (at testes) 0.323; ecsoma 0.508 × 0.312, slightly retracted; total length 2.397, maximum width 0.370; distance from posterior margin of acetabulum to ecsoma 1.367. Cuticular plications extending from level of poterior region of acetabulum to immediately posteuterine. Oral sucker diameter 0.105; conspicuous preoral lobe 0.018. Acetabulum one-fifth length of body proper from anterior end, one-sixth to one-seventh total length; length 0.304, dorso-ventral depth 0.285. Ratio of lengths of suckers 1:2.9. Pharynx diameter 0.062. Esophagus short, sac-like. Ceca ascending at sides of pharynx to oral sucker, then turning caudad and entering ecsoma two-fifths length of latter. Excretory pore terminal, median stem ascending ecsoma.



Testes diagonal, in contact, transversely oval, anterior testis 0.099 × 0.119, posterior testis 0.112 × 0.132, distance from posterior margin of acetabulum to anterior testis 0.158, to posterior testis 0.238. Vasa efferentia joining to form short vas deferens. Seminal vesicle starting well posterior to acetabulum at level of anterior margin of anterior testis and terminating at posterior margin of acetabulum, thin-walled, tripartite, posterior chamber 0.102 × 0.072, middle chamber 0.094 × 0.039, anterior chamber 0.046 × 0.027. Pars prostatica long, starting at level of posterior portion of acetabulum, with distinct dorsal loop immediately upon origin from seminal vesicle; prostatic gland cells along entire length, less abundant in narrow area for posterior portion, more abundant and wider area for anterior portion. Hermaphroditic duct praecetabular, formed by union of ventral metraterm with pars prostatica at anterior extremity of prostatic gland cells and terminating at level of pharynx, 0.093 × 0.019, enclosed in narrow, thin-walled sinus sac 0.163 × 0.029, duct narrowing anteriorly and terminating in egg-shaped, muscular bulb, bulb 0.036 × 0.029, projecting free into genital atrium. Genital atrium tubular, 0.070 × 0.017, leading to genital pore near antero-ventral margin of oral sucker.

Ovary transversely oval, 0.152 × 0.191, larger than either testis, median, posttesticular, in contact and in tandem with posterior testis, distance from posterior margin of acetabulum to ovary 0.337. Vitellaria of 9 tubular lobes, 4 right and 5 left, one lobe extending anteriorly to posterior margin of anterior testis while remainder extending laterally and posteriorly, terminating well in advance of ecsoma, some of lobes lying both dorsal and ventral to ovary. Uterus winding, dorsal to vitellaria, ovary and testes, descending to approximately half way between ends of vitellaria and ecsoma, ascending limb on right; metraterm ventral to pars prostatica, joining it praecetabular to form hermaphroditic duct. Eggs numerous, 10 measuring 0.0185 (0.018-0.019) × 0.0115 (0.011-0.012).

Host: *Hydrocyon forskalii* (Characidae).

Habitat: Small intestine.

Locality: Giza Fish Market, Giza Province, Egypt.

Date: November 22, 1952.

Type: U. S. Nat. Mus. Helm. Coll., No. 59678 (1 whole mount slide of type).

Dawes (1946, 1947) declared *Dinurus barbatus* (Cohn, 1903) Looss, 1907, *D. breviductus* Looss, 1907, and *D. longisinus* Looss, 1907, as synonyms of the type species *Dinurus tornatus* (Rudolphi, 1819) Looss, 1907. Manter (1947) recognized all the above as valid; he considered *D. coryphaenae* Yamaguti, 1934, a synonym of *D. longisinus*. Yamaguti (1954) listed all the above as valid species in addition to listing *D. cuthbeni* Yamaguti, 1934, *D. magnus* Manter, 1931, *D. nanaimoensis* McFarlane, 1936, *D. pinguis* Linton, 1940, *D. rubeus* Linton, 1910, and *D. scombri* Yamaguti, 1934. Earlier, Manter (1947) had placed *D. magnus* and *D. rubeus* in the genus *Stomachicola*, and *D. nanaimoensis* and *D. pinguis* in the genus *Tubulovesicula*. Yamaguti (1958) now listed these changes, and continued to recognize *D. coryphaenae*. Sogandares-Bernal and Hutton (1959) recognized the validity of *D. longisinus*, showing that it could be easily separated from *D. tornatus*.

Dinurus gizae most closely resembles *D. scombri*. It differs from the latter in having the acetabulum nearly 3 times longer than the oral sucker rather than the same size, the cuticular plications postacetabular only rather than over the entire body proper, the seminal vesicle tripartite rather than quadripartite, the ceca entering the ecsoma for two-fifths length of the latter rather than to its posterior extremity, and the hermaphroditic duct terminating in a muscular bulb rather than lacking one.

present in all

From Proc. Helm. Soc. Wash. 30: 78-80

Hemiuridae

Dinurus longisinus Looss, 1907

Syn

Dinurus coryphaenae n. sp. Yam. 1934 see Manter, 1947

SPECIFIC DIAGNOSIS. *Dinurus* Looss, 1907; with generic characters. Body 4.5–9.0 × 0.45–0.9 mm, broadest at vitellarian level. Tail usually longer than body proper. Cuticular denticulations conspicuous. Preoral lip 0.03–0.06 mm long. Oral sucker 0.21–0.32 × 0.21–0.39 mm. Acetabulum 0.41–0.58 × 0.4–0.68 mm, in front of middle of anterior third of body. Testes oval, 0.17–0.49 × 0.16–0.49 mm, at or in front of junction of anterior with middle third of body. Vesicula seminalis divided into three parts. Pars prostatica and prostatic cells well developed. Ductus hermaphroditicus beginning behind middle of acetabulum. Ovary 0.11–0.3 × 0.15–0.55 mm, pre-equatorial. Vitelline lobes extending into tail. Posterior end of uterus in posterior third of body. Eggs 0.021–0.024 × 0.0126–0.0132 mm.

Habitat. Stomach of *Coryphaena hippurus* (type host), *Seriola aureovittata*.
Locality. Pacific coast (type locality), Inland Sea, Toyama Bay.
Date. September 4, 1928 (type date); October 20, 1929; September 10, 1932.
Type and paratypes in my collection.

The measurements in mm on four specimens fixed in alcohol and mounted in balsam without applying pressure are as follows.

Host	Body proper	Tail	Oral sucker	Acetabulum	Testes	Ovary
Coryphaena hippurus	3.2–3.6	5.3–5.4	0.3–0.32 × 0.35–0.39	0.56–0.58 × 0.63–0.68	0.36–0.49 × 0.44–0.49	0.26–0.3 × 0.5–0.55
Seriola aureovittata	2.63–2.9	2.24–3.1	0.22–0.26 × 0.25–0.31	0.41–0.51 × 0.4–0.51	0.23–0.34 × 0.26–0.35	0.15–0.22 × 0.26–0.27

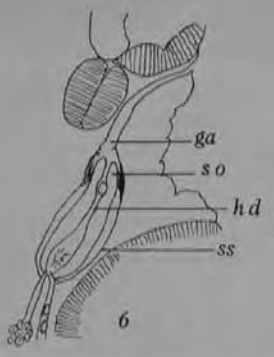
DISCUSSION. According to Looss, the variability in length of the ductus hermaphroditicus as well as of the genital atrium is limited to a certain extent in one species and consequently a remarkable difference in their length can be regarded as a specific distinction. In my specimens the proximal end of the ductus hermaphroditicus is usually found at a level behind the middle of the acetabulum and sometimes at the level of the posterior border of the acetabulum. In this respect and in the size of the body as well as of the suckers my species resembles *Dinurus longisinus* Looss, 1907, more closely than any other members of the genus, but differs from it definitely in the size of eggs.

Dinurus longisinus Looss 1907
(D. Breviductus)

Much like the above species with similar size, suckers, and ringing of the skin. Cirrus sac of same thickness is considerably longer reaching normally to something past the the middle of the ventral sucker Eggs 17-19 by 11-13μ

Host: Coryphaena hippuris ---Red Sea

Looss a little uncertain in regard to this latter species.



From Manter, 1969

Dinurus longisinus Looss, 1907

Host.—*Coryphaena hippurus* Linn., dolphin.

Location.—Stomach.

Locality.—Two hosts from 12 mi. N.W. San Jose Island, Archipielago de las Perlas, Panama Pacific; and 1 host from the Lerner fish pens, N. Bimini, B.W.I. [new locality record].

Discussion.—*D. longisinus* is a common parasite of dolphins from the Panamanian Pacific. Manter (1947) reported *D. longisinus* from 2 of 6 hosts in Tortugas, Florida. It also occurs in Japan and in the Red Sea, and is probably almost world wide in distribution.

Sogandares, 1959

—over—

155. *Dinurus longisinus* Looss, 1907

(Fig. 154)

HABITAT: Stomach of *Coryphaena hippurus*; Hawaii.

DESCRIPTION (based on 25 flattened whole mounts): Body elongate, attenuated in postacetabular region, 4.0-9.0 mm in total length including tail which is 1.7-4.2 mm long, up to 0.55-0.85 mm wide in vitellarian zone. Cuticle of body proper distinctly serrate. Oral sucker subterminal, 0.18-0.3 mm in diameter, surmounted by preoral lobe. Pharynx 70-150 × 100-170 μ; esophagus 0.1-0.15 mm long; ceca reaching to posterior end of tail. Acetabulum 0.4-0.6 mm in diameter, near anterior extremity.

Testes ovoid, 0.16-0.43 × 0.16-0.34 mm, obliquely tandem at or near junction of anterior with middle third of body. Seminal vesicle tripartite, 0.18-0.35 × 0.07-0.17 mm, overlapping anterior testis in contracted specimens or separated from it in extended specimens; pars prostatica surrounded by dense coat of prostatic cells throughout its length, winding between seminal vesicle and acetabulum. Hermaphroditic duct enclosed in a sheath-like muscular hermaphroditic pouch 0.2-0.8 mm long by 50-100 μ wide, extending slightly back of acetabulum when fully extended; when contracted, however, it extends only to anterolateral edge of acetabulum. Genital atrium very variable in length like hermaphroditic pouch, 0.1-0.5 mm long, opening ventral to oral sucker.

Ovary reniform, 0.13-0.22 × 0.2-0.35 mm, confined to middle third of body. Vitellaria consisting of seven long winding tubes, three on one side and four on the other, occasionally three on each side, but in this case one is divided distally into two short branches. Usually two forwardly directed tubes embracing ovary, and backwardly directed tubes may extend into tail. Descending uterine coils extending well into tail, ascending uterus winding forward ventral to testes, seminal vesicle, and pars prostatica, and joining distal end of pars prostatica to form hermaphroditic duct at varying levels. Mature eggs 18-23 × 12-14 μ in life. Excretory arms united dorsal to pharynx.

DISCUSSION: Our Hawaiian specimens agree well with Looss' original description (1907) and his illustrations (Pl. 8, Fig. 13; Pl. 10, Fig. 24 and 25, 1908). *Dinurus coryphaenae* Yamaguti, 1934 is probably a synonym of this species, as pointed out by Manter (1947).

Yam., 1970

GU CHANG DONG AND SHEN JIWEI, 1978

1. ***Dinurus magnacetabulum*** ~~sp. nov.~~ (fig. 1)

This species differs from the hitherto described species of the genus *Dinurus* Looss, 907 in having the largest acetabulum and in the sucker ratio being 1:3.5.

图1 大盘双尾吸虫，新种 *Dinurus magnacetabulum* sp. nov. 的腹面

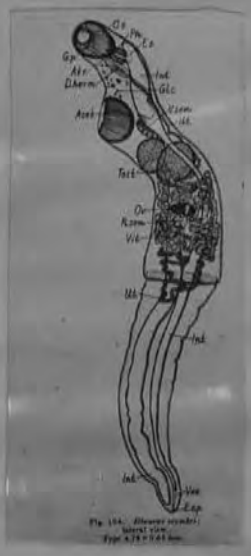
Dinurus scombri Yamaguti, 1934

Dinurus scombri n. sp.

SPECIFIC DIAGNOSIS.[1] *Dinurus* Looss, 1907; with generic characters. Body 3.6–4.78 × 0.51–0.65 mm, broadest at tail invagination. Tail approximately as long as body proper or a little shorter. Cuticle and subcuticular musculature not strongly developed. Preoral lip not conspicuous. Oral sucker 0.34–0.37 × 0.26–0.32 mm. Pharynx about 0.14 mm in diameter. Acetabulum 0.3–0.34 × 0.3 mm, at about middle of anterior third of body. Testes 0.13–0.26 × 0.19–0.39 mm, near posterior limit of anterior third of body. Uterus loosely coiled, extending a little into tail. Eggs 0.014–0.017 × 0.0085–0.01 mm.

Habitat. Stomach of *Scomber japonicus* Houttuyn.
Locality and date. Toyama Bay; October 22, 1929.
Type and paratype in my collection.

DISCUSSION. This species bears a certain resemblance to *D. euthynni*, but differs distinctly in the size of the body, in the relative length of the tail and in the extent of the uterus.



DINURUS

Chupenuroides ~~n. g.~~: Al-Yamani and Nahhas, 1981

Body elongate, appendiculate. Cuticle smooth or finely ringed. Eye-spot pigments absent. Oral sucker subterminal; pharynx present; oesophagus short; caeca extending to at least posterior end of soma. Ventral sucker in mid third of soma, larger than oral sucker. Testes two, side by side or slightly diagonal; seminal vesicle thick-walled, ovoid, posterodorsal to acetabulum. Prostatic duct long, devoid of prostate cells except for terminal portion which forms swelling or small prostatic vesicle surrounded by prostate cells just before joining the metraterm at base of sinus sac. Hermaphroditic duct surrounded by hermaphroditic sac (sinus sac); genital atrium tubular, pore near pharynx. Ovary globular, post-testicular; uterus extends posterior to ovary, but chiefly occupies space between ovary and hermaphroditic sac; metraterm not swollen at its terminal end; seminal receptacle and Laurer's canal absent. Vitellaria seven digitiform tubules, chiefly postovarian. Eggs numerous, small. Excretory arms unite anteriorly. Stomach parasites of marine fishes. Type species: *C. sheemi*.

The next species considered is a dinurid with close relationship to *Ectenurus* Looss, 1907, *Erilepturus* Woolcock, 1935, *Clupenurus* Srivastava, 1935 and *Uterovesiculurus* Skrjabin and Guschanskaja, 1954. This is evident in the ecsomate bodies, topography of the gonads, and the basic structure of the prostatic duct, which in this group, is a long tube not surrounded by prostate cells except for a short portion at the distal end just before it joins the metraterm. Various characteristics have been used to distinguish the four genera, including presence or absence of cuticular plications, nature of the seminal vesicle (tubular, saccular, bipartite, tripartite, etc.), presence or absence of a swelling at the terminal end of the uterus, presence or absence of a seminal receptacle, and union (or lack thereof) of excretory crura in the anterior region of the body. Over 25 species have been named; often the same species placed in different genera by different authors. Manter (1947) separated *Ectenurus* from *Erilepturus* on the basis of presence of cuticular plications and lack of union of excretory crura in the anterior region of the body. Yamaguti (1971) did not give any generic significance to the presence of cuticular plications but recognized the generic importance of the excretory crura. The latter unite anteriorly in *Erilepturus*, *Uterovesiculurus*, and *Clupenurus*. These genera, according to Yamaguti (1971), are also characterized by the presence of a seminal receptacle, although such a structure is not indicated as present in the original description of a number of species. If the genera *Erilepturus*, *Uterovesiculurus* and *Clupenurus* have seminal receptacles as implied by Yamaguti (1971), then the four specimens encountered in this study should be assigned to a new genus, for which the name *Clupenuroides* is suggested and it is characterized as follows:

The five genera may be distinguished by the following key:

1	A.	Main excretory crura do not unite anteriorly; seminal receptacle absent	*Ectenurus*
	B.	Main excretory crura unite anteriorly; seminal receptacle present or absent	2
2	A.	Seminal receptacle absent	*Chupenuroides*
	B.	Seminal receptable present	3
3	A.	Metraterm swollen at its distal end	*Uterovesiculurus*
	B.	Metraterm not swollen at its distal end	4
4	A.	Seminal vesicle muscular, ovoid; Laurer's canal present	*Clupenurus*
	B.	Seminal vesicle not muscular, usually tubular, bipartite or tripartite	*Erilepturus*

Clupenuroides sheemi ~~n.g., n.sp.~~ Al-Yamani and Nahhas, 1981

Host: *Eleutheronema tetradactylum* (Shaw). $\frac{2}{2}$
Site: Stomach
Locality: Al-Fahaheel
Holotype: U.S.N.M. 75558
Paratype: U.O.P. Parasitol. Col.: K-8-11-5-78

Description and measurements based on four mature specimens: Body elongate, appendiculate; ecsoma completely retracted into the soma in three and partially in one; soma 1.722-2.505 mm long, 0.400-0.742 mm wide at level of ventral sucker. Cuticle smooth, finely ringed in one specimen; eye-spot pigments absent. Oral sucker subterminal, 0.110-0.148 mm in diameter; ventral sucker in midbody third, 0.357-0.505 mm long, 0.297-0.445 mm wide; sucker ratio about 1:3. Prepharynx absent; pharynx 0.055-0.114 mm in diameter; oesophagus about as long as pharynx; caeca extending to posterior end of soma. Testes two, symmetrical to slightly diagonal, globular, 0.103-0.176 mm long, 0.147-0.246 mm wide; seminal vesicle ovoid, thick-walled, 0.147-0.297 mm long, 0.066-0.154 mm wide, posterodorsal to acetabulum; one specimen showing shallow constriction in contents of vesicle but not the vesicle itself. Prostatic duct long, about four to six times length of seminal vesicle, devoid of cells throughout most of its length except for terminal part which forms a swelling or a vesicle surrounded by prostate cells, just before it joins metraterm at base of hermaphroditic sac. Ovary smooth, posterior to and in contact with left testis, 0.108-0.176 mm long by 0.068-0.167 mm wide; seminal receptacle absent; uterus reaches posterior end of soma, but is chiefly preovarian; metratermal vesicle or swelling not evident. Vitellaria seven thick digitiform lobes, immediately posterior to ovary. Hermaphroditic sac in anterior fourth of body, smaller than seminal vesicle; genital atrium tubular, pore near base of pharynx or midway between intestinal bifurcation and pharynx. Eggs numerous, uncollapsed eggs 17-20 by 8-12 µm. Excretory crura uniting dorsal to base of pharynx.

The species is named after the local name of the host.

CLUPENUROIDES

Ectenurus Looss, 1907

Syn. *Erilepturus* Woolcock, 1935

Generic diagnosis. — Hemiuridae, Dinurinae: Body elongate, with tail partly or entirely invaginated. Oral sucker subterminal, with preoral lobe. Esophagus short, ceca extending into tail. Acetabulum large, near anterior extremity. Testes diagonal, tandem or juxtaposed, postacetabular. Vesicula seminalis saccular, more or less elongate, often constricted into two or three parts, posterodorsal to acetabulum. The duct connecting the seminal vesicle with the hermaphroditic duct is long, narrow and

surrounded by prostate cells at its anterior portion alone. Ductus hermaphroditicus enclosed in hermaphroditic pouch, opening into genital atrium. Genital pore ventral to oral sucker. Ovary median or submedian, in middle third of body. Vitellaria of seven winding tubular lobes. Uterus may or may not extend into tail; metraterm not forming saccular dilatation just before opening into ductus hermaphroditicus. Excretory arms uniting dorsal to pharynx. Stomach parasites of marine fishes.

Genotype: *E. lepidus* Looss, 1907 (Pl. 23, Fig. 294), in *Lichia amia;* also in *Atherina hepsetus, Caranx trachurus, Cepola rubescens, Lophius piscatorius, Maena vulgaris, Scomber colias, Smaris alcedo, Trachypteron taenia;* Mediterranean. In *Trachurus trachurus* Scotland, Black Sea — Vlasenko (1931); *Helicolenus percoides, Trachurus novaezelandiae:* New Zealand. — Manter (1954).

Other species:

E. lemeriensis Tubangui et Masiluñgan, 1935, in *Scomberoides* sp.; Philippines. Also in *Glossogobius giurus;* Manila.

E. tiegsi (Woolcock, 1935) (syn. *Erilepturus t.* W.) in *Arripis trutta;* S. Australia.

E. virgula Linton, 1910, in *Clupanodon pseudohispanicus, Bothus ocellatus, Harengula macrophthalma,* Florida; *Trachurops crumenophthalma,* Woods Hole, Florida.

ECTENURUS Looss, 1907

"Small forms which differ from Dinurus chiefly in that the prostate cells are limited to a short region of the duct connecting the cirrus sac and seminal vesicle while the far greater part of this duct remains free. Vitellaria consist of short only slightly coiled tubes."
Type species: Ectenurus lepidus Looss, 1907

The tail is well developed compared with Dinurus.

Ectenurus lepidus Looss, 1907

About 2. mm. by 0.25 to 0.3 mm. A pair of dorsal papillae on the head, one on each side of the midline. Ventral sucker more than 2 times the oral sucker. Oral sucker 0.08 to 0.12 Ventral sucker 0.20 to 0.30 mm. Genital pore not far behind mouth, opposite oral sucker. Body rings sharp but lacking on the ventral surface between the suckers and on the posterior part of the dorsal surface. Cirrus sac (sinus sac ?) short and thick, st most overlapping anterior edge of ventral sucker, atrium always shorter than the sac. Duct bedind pars prostatica free of prostate cells. Seminal vesicle behind ventral sucker. Tubes of vitellaria short, only slightly coiled and reaching scarcely to the back. Eggs almost colorless, average 20 by 10μ.

Chief host: Lichia amia At Triest
Next : Lichia Caranx trachurus
Rarely in : Scomber clias
Maena vulgaris
Lophius piscatorius
Smaris alcedo
Immature in : Trachypterus taenia
Cepola rubescens
Atherina hepsetus

Species : E. lepidus Looss, 1907
E. angusticauda Nicoll, 1915 — transferred to Tubovesicula by Yamaguti, 1934, p. 464
E. virgula Linton, 1910 — Not in this genus according to Yamaguti, 1934 - p. 467
? - E. platycephali Yamaguti, 1934
? - E. hamati Yamaguti, 1934
? - E. paralichthydis Yamaguti, 1934
? - E. lemeriensis Tubangui & Masilungan, 1935

Looss does not describe ex. system but in Dinurus the cirrus do not unite & he states that Ectenurus is like Dinurus except for prostatic gland & vitellaria

Genera ECTENURUS Looss, 1907, DINURUS Looss, 1907 and Related Genera

Compared with most of Looss' genera, the genus *Ectenurus* has been rather troublesome. Probably every species which has been added to the genus is open to question. *Ectenurus angusticauda* Nicoll, 1915 was transferred to *Tubulovesicula* by Yamaguti, 1934. Srivastava (1937a), in a preliminary abstract, states that some species named in *Ectenurus* do not belong in that genus. His *E. indicus* was not diagnosed in the abstract and hence is a *nomen nudum*. Yamaguti (1934:464) states that *Ectenurus virgula* Linton, 1910 does not belong in *Ectenurus* but states no reason for that conclusion.

Looss named *Ectenurus* as a close relative of *Dinurus* with which he stated it agreed except (1) the prostatic gland cells were limited to the anterior portion of the prostatic duct, and (2) the vitelline tubes were shorter. The latter point is probably too variable and relative to apply easily.

In *Dinurus* Looss, 1907, the vitellaria consist of sinuous tubes; the ecsoma is well developed and in addition: (1) cuticular plications are conspicuous, (2) the seminal vesicle is tripartite; (3) the excretory crura do not unite anteriorly; and (4) prostatic cells occur along practically the entire length of the pars prostatica.

Lecithocladium Lühe, 1901 is like *Dinurus* except that the seminal vesicle is sac-like and has a thick muscular wall; the oral sucker is more funnel-shaped and the pharynx more cylindrical.

Another related genus is *Magnacetabulum* Yamaguti, 1934 which is like *Dinurus* except the seminal vesicle is tubular and twisted rather than tripartite and the prostatic gland cells are apparently absent.

In 1935, Woolcock named the genus *Erilepturus* which she considered close to *Ectenurus*. It differed in that (1) the cuticula, although faintly ringed, did not possess the plications characteristic of *Ectenurus* and *Dinurus*, (2) the seminal vesicle was not distinctly tripartite, and (3) the excretory crura united anteriorly. The greater portion of the prostatic duct was free of gland cells. Also, the acetabulum was rather far posterior near the middle of the body.

Tubulovesicula Yamaguti, 1934 is much like *Erilepturus*. It lacks definite plications; the seminal vesicle is not tripartite; and the excretory crura unite. It differs only in that the long pars prostatica is surrounded by gland cells along all or nearly all its length. The seminal vesicle tends to be more tubular than sac-like and the acetabulum tends to be more anterior.

Stomachicola Yamaguti, 1934 is very large in size; lacks cuticular plications; the seminal vesicle is sac-like; prostatic gland cells occur along most or all of the prostatic duct; and the ecsoma is much longer than the body proper.

There has been considerable confusion in allocation of species among

the above genera. The presence or absence of sharp-edged cuticular plications (the "rings" of *Hemiurus*) seems to be a valid generic character visible even in pressed specimens, and, in this group at least, it seems usually to be correlated with non-uniting excretory crura (exception: *Clupenurus* Srivastava, 1935). Only in the case of a few species of *Lecithocladium* do these characters seem unreliable. Two other generic characters, I believe, might be accepted: the tripartite seminal vesicle (as in *Dinurus*), and the lack of prostatic gland cells along a large part of the prostatic duct. All the above genera possess well developed ecsoma and tubular vitellaria. The following classification is suggested.

Dinurus: Cuticular plications present; seminal vesicle tripartite; gland cells along all or most of the long pars prostatica; excretory crura do not unite. Type species: *D. tornatus* (Rud., 1819) Looss, 1907. Other species: *D. barbatus* (Cohn, 1903) Looss, 1907; *D. breviductus* Looss, 1907; *D. longisinus* Looss, 1907; *D. scombri* Yamaguti, 1934; *D. coryphaenae* Yamaguti, 1934; *D. euthynni* Yamaguti, 1934.

Ectenurus: Cuticular plications present; seminal vesicle tripartite; a long portion of the pars prostatica without gland cells; excretory crura do not unite. Type species: *E. lepidus* Looss, 1907. Other species: *E. virgulus* Linton, 1910

Magnacetabulum: Cuticular plications present; seminal vesicle tubular; prostatic gland cells lacking or rudimentary; excretory crura do not unite. Type species: *M. trachuri* Yamaguti, 1934.

excretory crura unite. Type species: *T. spari* Yamaguti, 1934. Other species: *T. anguillae* Yamaguti, 1934; *T. muraenesocis* Yamaguti, 1934; *T. californica* Park, 1936; *T. pseudorhombi* Yamaguti, 1938; *T. lindbergi* (Layman, 1930) Yamaguti, 1934; *T. nanaimoensis* (McFarlane, 1935) n. comb. (synonym: *Dinurus nanaimoensis* McFarlane, 1935); *T. pinguis* (Linton, 1940) n. comb. (synonym: *Dinurus pinguis* Linton, 1940). *T. angusticauda* (Nicoll, 1915) Yamaguti, 1934.

Although *Clupenurus* Srivastava, 1935 was thought probably to be a synonym of *Tubulovesicula* by Manter (1940), it differs in that more than half the long prostatic duct is without gland cells, and cuticular plications are present. *Clupenurus* should probably stand as a genus closely related to *Lecithocladium* and *Magnacetabulum*.

Stomachicola: Cuticula without denticulations or plications; seminal vesicle oval, not markedly muscular; pars prostatica glandular along all or most of its length; ecsoma much longer than body and containing most of the intestinal ceca and uterus and parts of the vitelline coils; excretory crura usually not observed, probably uniting dorsal to oral sucker (see Linton, 1910:65). Size large. Type species: *S. muraenesocis* Yamaguti, 1934. Other species: *S. secunda* Srivastava, 1939; *S. magna* (Manter, 1931) n. comb. (synonym: *Dinurus magnus* Manter, 1928); *S. rubea* (Linton, 1910) n. comb. (synonym: *Dinurus rubeus* Linton, 1910).

Related genera, easily recognized by characteristic features are *Mecoderus* Manter, 1940 and *Elytrophallus* Manter, 1940.

Lecithocladium: Cuticular plications present; seminal vesicle sac-like with thick muscular walls; prostatic gland cells along all or most of the long prostatic duct; pharynx strong and elongate; excretory crura do not unite.* Type species: *L. excisum* (Rud., 1819) Lühe, 1901 (synonym: *L. excisiforme* Cohn, 1902). Other species: *L. cristatum* (Rud., 1819) Looss, 1907; *L. crenatum* (Molin, 1859) Looss, 1907; *L. gulosum* (Linton, 1901) Looss, 1907; *L. psenopsis* Yamaguti, 1934; *L. pagrosomi* Yamaguti, 1934; *L. glandulum* Chauhan, 1945; *L. carultum* Chauhan, 1945; *L. annulatum* Chauhan, 1945; *L. harpodontis* Srivastava, 1937; *L. brevicaudum* Srivastava, 1937. Probably not all these species belong in the genus. The last two named above lack cuticular plications and the excretory crura unite.

Erilepturus: Cuticular plications lacking; seminal vesicle not tripartite; a long region of the prostatic duct without gland cells; excretory crura unite; a seminal receptacle is present. Type species: *Erilepturus tiegsi* Woolcock, 1935. Other species: *E. hamati* (Yamaguti, 1934) n. comb. (synonym: *Ectenurus hamati* Yamaguti, 1934); *E. paralichthydis* (Yamaguti, 1934) n. comb. (synonym: *Ectenurus paralichthydis* Yamaguti, 1934); *E. lemeriensis* (Tubangui & Masilungan, 1935) n. comb. (synonym: *Ectenurus lemeriensis* Tubangui & Masilungan, 1935).

Tubulovesicula: Cuticular plications lacking; seminal vesicle tubular or indistinctly bipartite; gland cells along all or most of the prostatic duct;

* According to Looss, Yamaguti states that the crura do unite

Family HEMIURIDAE

48. Ectenurus lepidus Looss, 1907

HOSTS: *Helicolenus percoides* Richardson, sea perch; stomach.
Trachurus novae-zelandiae (Richardson), horse mackerel; stomach.

LOCALITY: Wellington.

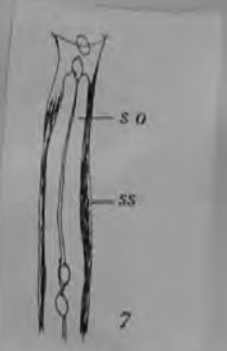
SPECIMEN DEPOSITED: U.S. Nat. Mus. Helminth. Collection No. 49170.

DISCUSSION: A total of six specimens were collected, five of them from the mackerel. Two of these five were from the stomach of a partially digested, small mackerel, probably *T. novae-zelandiae*, from the stomach of a kahawai, *Arripis trutta*. A few minutes later that specimen might have seemed to be a parasite of *Arripis*. Probably some of the host records of Looss represent transient "infections" from a food fish.

The specimens agree with characters described for *E. lepidus* although the dorso-lateral preoral papillae are inconspicuous and not always evident perhaps because of flattening of specimens in killing. The "short and thick" sinus sac figured by Looss is evidently in a contracted state. In my specimens with extended forebody it is longer but does not reach the acetabulum. Prostatic cells occur only around the anterior third of the ejaculatory duct. Sucker ratio was 1 : 2·8 to 3 compared with the described 1 : 2·5. Eggs are yellow-shelled when mature and measure 18 to 21 by 9 to 10μ.

E. virgulus Linton, 1910 is a related species but differs in having a longer sinus sac and in addition prostatic gland cells occur around the male duct near the seminal vesicle and not near the sinus sac.

E. lepidus is known from mackerel and other fishes at Trieste in the Mediterranean and from the horse mackerel, *Trachurus trachurus*, at Aberdeen, Scotland, and now from New Zealand.



Manter, 1969

Ectenurus lepidus Looss, 1907 (Fig. 3)

HOSTS (both new records): *Decapterus pinnulatus* (Eydoux & Souleyet), 'opelu, mackerel scad, or 'opelu-mama (Carangidae); 5 specimens from 3 hosts. *Anampses cuvieri* Quoy & Gaimard, 'opule or hilu (Labridae, wrasses); 1 from 1 host.

LOCATION: Intestine

SPECIMEN deposited: U. S. Nat. Mus. Helminth. Coll., No. 39176.

DISCUSSION: *E. lepidus* has been reported principally from carangids in the Adriatic, Mediterranean, and Black seas, and at Aberdeen, Scotland, Wellington, New Zealand, and now Hawaii. Vlassenko (1931) found no anterodorsal papillae on his specimen from the Black Sea; Manter (1954) observed that the papillae "are inconspicuous and not always evident"; very small ones were observed on only one of the Hawaiian specimens, and that specimen was flattened with the preoral lobe bent ventrally over the oral sucker.

In most respects the Hawaiian specimens agree with specimens of *E. lepidus* reported from other localities. The sucker ratio is both smaller and larger than reported by Looss (1:2.4 to 2.8 as compared with 1:2.5) and it reaches the lower limit reported by Manter (1:2.8 to 3). The eggs average smaller (16 by 10) than those reported by Looss (20 by 10), but the range (13 to 19 by 8 to 11) overlaps the limits reported by Manter (18 to 21 by 9 to 10). Like the New Zealand specimens, the sinus sac is elongate but does not reach the acetabulum.

from Manter & Pritchard, 1960

Ectenurus lepidus Loss, 1907

(Est. 21, fig. 72)

Ectenurus lepidus Looss, 1907: 597
Ectenurus lepidus Looss, 1907: 64, 69, 123, 124-125, 175, 178, taf. 10, figs. 26, 27, taf. 13, fig. 46
Ectenurus lepidus Nicoll, 1915: 346, 353, 364
Ectenurus lepidus Nicoll, 1915: 34
Ectenurus lepidus Mola, 1928: 416, 430, 431, 432, 433
Ectenurus lepidus Vlasenko, 1931: 91-93, 118-120, fig. 22
Ectenurus lepidus Osmanov, 1940
Ectenurus lepidus Dawes, 1946: 267
Ectenurus lepidus Manter, 1947: 349, 350
Ectenurus lepidus Butskaia, 1952: 36, 43
Ectenurus lepidus Janiszewska, 1953: 31, 47, 48
Ectenurus lepidus Chauhan, 1954: 315
Ectenurus lepidus Manter, 1954: 536, 558, 559, 561
Ectenurus lepidus Skrjabin & Guschanskaja, 1954: 380, figs. 109, 110
Ectenurus lepidus Yamaguti, 1954: 190, pl. 23, fig. 294
Ectenurus lepidus Chernyshenko, 1955: 215
Ectenurus lepidus Pogorel'tseva, 1957: 15
Ectenurus lepidus Skrjabin & Guschanskaja, 1957: 726
Ectenurus lepidus Yamaguti, 1958: 277, pl. 23, fig. 294
Ectenurus lepidus Manter & Pritchard, 1960: 167, 168, pl. 1, fig. 3
Ectenurus lepidus Skrjabin, 1964: 242, fig. 359

Trematódeo pequeno, com cutícula pregueada e extremidades arredondadas; mede 1,17 mm de comprimento por 0,35 mm de largura. Ventosa oral subterminal, com 0,09 mm de diâmetro. Acetábulo grande, pré-equatorial, com 0,21 mm de comprimento por 0,22 mm de largura. Relação entre a ventosa oral e o acetábulo é de 1:2,38. Faringe presente, musculosa, com 0,047 mm de comprimento por 0,053 mm de largura. Esôfago nulo. Cecos intestinais sinuosos, não atingindo a extremidade posterior do corpo. Poro genital submediano, ao nível do bordo posterior da ventosa oral. Átrio genital (duto hermafrodita) tubular, com 0,133 mm de comprimento. Bôlsa do cirro longa, estendendo-se do átrio genital até pouco atrás do limite posterior da zona acetabular; mede 0,433 mm de comprimento por 0,053 mm de maior largura e encerra vesícula seminal longa, fracamente tripartida, com a porção proximal pequena e globosa, porção prostática mal evidenciada e cirro longo. Testículos pré-equatoriais, imediatamente pós-acetabulares, em grande parte na mesma zona e com campos e áreas parcialmente coincidentes; têm contôrno liso e medem: o do lado do ovário 0,09 mm de comprimento por 0,21 mm de largura e o do lado oposto 0,08 mm por 0,17 mm. Ovário imediatamente pós-testicular, no campo de um dos testículos e em contato com a zona testicular; tem contôrno liso e mede 0,08 mm de comprimento por 0,15 mm de largura. Glândula de Mehlis pouco nítida, na área ovariana. Espermateca e canal de Laurer não evidenciados. Útero com alças pós-ovarianas; abre-se, por delgada vagina, no átrio genital. Ovos operculados, pardacentos, com 0,019 a 0,020 mm de comprimento por 0,011 a 0,012 mm de largura. Vitelinos tubulares, em número de 7, dispostos transversalmente, ocupando as áreas extracecais, cecais e intercecal, em grande parte pós-ovarianos. Porção posterior do corpo invaginada em quase 2/5 do comprimento total. Poro excretor e vesícula excretora não observados.

Habitat — Intestino de **Oligoplites saurus** (Bloch & Schn.).

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

Material estudado depositado na Coleção Helmintológica do Instituto Oswaldo Cruz sob o número 30 030.

Essa espécie, de grande dispersão, ocorrendo no Oceano Atlântico (norte) e no Oceano Pacífico, assinalada nos seguintes peixes: **Trachurus trachurus, Atherina hepsetus, Lichia amia, Scomber colias, Maena vulgaris, Smaris alcedo, Trachypterus taenia, Lophius piscatorius, Cepola rubescens, Lophius budegassa, Lichia glauca, Smaris vulgaris, Atherina lacustris, Atherina sarda, Pomatomus saltatrix, Helicolenus percoides** Richardson, **Trachurus novaezelandiae** (Richardson), **Decapterus pinnulatus** (Eydoux & Souleyet) e **Anampses cuvieri** Quoy & Gaimard, é agora encontrada, no Atlântico sul, em um nôvo hospedador.

FROM TRAVASSOS, TEIXEIRA DE FREITAS AND BÜHRNHEIM, 1967

Ectenurus lepidus Lss. as illustrated by Wlassenko (1931); (Black Sea)

lateral cephalic papillae absent
Host. Trachurus trachurus
one specimen - stomach

OVER

Ectenurus lepidus Looss, 1907

SYNONYMS: *Parectenurus chloroscombri* Siddiqi and Cable, 1960; *Ectenurus trachuri* Nikolaeva and Kovaleva, 1966.

HOSTS: *Chloroscombrus chrysurus* (L.), bumper, **Decapterus rhonchus* (Geoffroy St. Hilaire), mackerel scad (Carangidae); **Galeoides decadactylus* (Bloch), threadfin (Polynemidae).

HABITAT: Stomach.

LOCALITIES: Cape Coast (*C. chrysurus*), Tema (others), Ghana.

SPECIMENS DEPOSITED: USNM Helm. Co Nos. 71687–71689.

DISCUSSION: This species has been reporte from a variety of marine fishes (most carangids) from the Mediterranean, Adriat and Black Seas, Brazil, New Zealand, Hawa and Gulf of Aden. We declare *Parectenur chloroscombri* Siddiqi and Cable, 1960, bas on a single worm from *Chloroscombrus chr urus* from Puerto Rico, and *Ectenurus trach* Nikolaeva and Kovaleva, 1966, from *Trachur mediterraneus* (Steindachner) (Carangida from the Mediterranean, Tyrrhenian, a Adriatic Seas synonyms of *Ectenurus lepid* Siddiqi and Cable (1960) placed their n species in the genus *Parectenurus* Mant 1947, but Manter and Pritchard (1960) d clared it a synonym of *Ectenurus* Looss, 190 The former authors separated their form on t basis of an undivided seminal vesicle, b stated in the description that it had "shallo constrictions but not divided into distinct div sions." In our material from the same ho species the division of the seminal vesic varied from that described by Siddiqi an Cable to a distinct tripartite structure. Com parison of our specimens with two of *Ectenur lepidus* from *Decapterus pinnulatus* (Eydo and Soulayet) reported by Manter and Pritcha (1960) from Hawaii (kindly loaned by D Mary Hanson Pritchard, University of Ne braska) and with the single specimen of *Pa ectenurus chloroscombri* (USNM Helm. Co No. 39397) show them to be basically alik Nikolaeva and Kovaleva (1966) noted th their new species is most closely related to *E lepidus*, but differs in having a sucker ratio 1:3–4, in the ovary being larger than the teste in lacking padlike thickenings on the anter dorsal part of the body, and in the more po terior extension of the ceca into the ecsom In our material the ovary varies from muc smaller than the testes to much larger; th ceca extend into the ecsoma variable distance only a few specimens show anterodorsal pad like thickenings; and the sucker ratios are usu ally slightly less than 1:3.0. Manter an Pritchard (1960) noted that the padlike thicken ings are inconspicuous and not always evident additionally, they noted that the sucker rati is 1:2.8–3.0 in Manter's (1954) specimen from New Zealand.

FROM FISCHTHAL AND THOMAS, 1971

157. *Ectenurus lepidus* Looss, 1907
(Fig. 156)

HABITAT: Stomach of *Decapterus pinnulatus*, *Decapterus maruadsi*, *Caranx mate*, *C. sexfasciatus*, *Trachurops crumenophthalmus*, and *Elagatis bipinnulatus*; Hawaii.

DESCRIPTION (based on 64 whole mounts): Body elongate, 0.9-4.8 mm in total length, with maximum width of 0.2-0.8 mm in postvitellarian region. Forebody short, tapered anteriorly; tail 0.3-1.4 mm long, with blunt end, or truncate when invaginated. Cuticle conspicuously serrated except on tail and midventral surface of forebody. Oral sucker 70-180 × 80-190 μ, surmounted by inconspicuous preoral lobe. Pharynx 40-100 × 40-100 μ; esophagus tubular or bulbous, 30-80 × 20-50 μ; ceca terminating near posterior end of tail. Acetabulum 0.18-0.58 mm in diameter, situated at or near middle of anterior third of body or more posteriorly. Sucker ratio 1 : 2.3-3.8.

Testes contiguous, usually obliquely tandem, shortly behind acetabulum, 0.04-0.25 × 0.055-0.28 mm. Seminal vesicle may be simple or bi- or tripartite, up to 35-150 μ wide posteriorly, reaching to near either anterior or posterior testis or both, with its attenuated anterior end alone surrounded by prostate cells just anterodorsal to acetabulum. Hermaphroditic duct narrow, straight, 90-250 μ long, definitely longer than genital atrium, may be slightly swollen at proximal end, provided with sheath-like hermaphroditic pouch consisting mainly of longitudinal muscle fibers. Genital atrium straight, tubular, opening ventral to oral sucker.

Ovary reniform or bean-shaped, 40-200 × 40-290 μ, ventral, pre-equatorial or at anterior end of middle third of body, contiguous to posterior testis or separated from it by uterine coils. Vitellaria consisting of seven, rarely six, winding tubular lobes, of which four are on the right and three on the left, but may be *vice versa*; two anteriorly directed lobes embracing ovary. Main bulk of uterus consisting of descending and ascending coils, immediately behind vitellaria, usually not extending into tail; distal ascending uterus passing between ovary and posterior testis or dorsal to them, then dorsal to anterior testis and seminal vesicle, and finally dorsal to acetabulum. Eggs elliptical, 14-21 × 8-12 μ in life. Excretory arms reaching to near oral sucker but not uniting dorsal to it.

DISCUSSION: This species differs from the most closely related *Ectenurus americanus* (Manter, 1947) Manter et Pritchard, 1960 (syn. *Parectenurus americanus*), from *Caranx bartholomaei* and *Synodus foetens* of Florida, in sucker ratio and egg size. In these respects it is intermediate between *Ectenurus trachuri* (Yamaguti, 1934) and *E. leiognathi* (Yamaguti, 1953) on the one hand and *E. americanus* (Manter, 1947) on the other. I have been unable to find *Ectenurus* species corresponding to "*E. lepidus* Looss" of Manter et Pritchard, 1960, in which the excretory arms are stated to unite anteriorly.

Yam., 1970.

Ectenurus americanus (Manter, 1947) Manter & Pritchard, 1960

Syn.: Parectenurus americanus Manter, 1947
Magnacetabulum americanum (Manter, 1947) Yam., 1954

160. **Parectenurus americanus** n. gen., n. sp.

Figs. 115, 116

HOSTS: *Caranx bartholomaei* Cuv. & Val., yellow jack; in 1 of 2 hosts examined; 3 specimens. *Synodus foetens* (Linn.), lizardfish; in 1 of 10 hosts examined; 1 specimen.

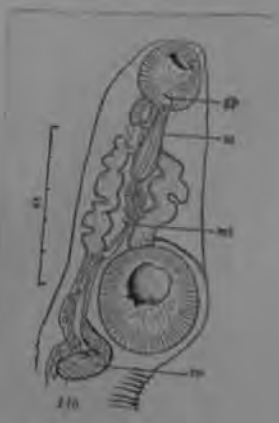
New host record.

LOCATION: Stomach or gills (probably an accidental location).

Description: Length of body 1.900 to 2.070 mm, width 0.467 to 0.469 mm; total length including ecsoma 2.527 to 3.760 mm. Cuticular plications well developed ventrally posterior to acetabulum, poorly developed dorsally for a short region posterior to acetabulum; other regions of body smooth. Oral sucker 0.160 to 0.212 mm, acetabulum 0.300 to 0.348, about 1/3 body length from anterior end; sucker ratio 1:1.6 to 1.9. Pharynx subglobular, 0.090 to 0.112 mm long by 0.082 to 0.122 mm wide; short esophagus present; ceca reaching into ecsoma. Genital pore at posterior border of oral sucker. Testes almost symmetrical a slight distance posterior to acetabulum, at base of seminal vesicle. Seminal vesicle not distinctly divided into three parts, moderately thick-walled; in the form of a swollen tube bent near its middle. Prostatic duct straight, 0.410 to 0.528 mm in length, its basal 2/3 to 3/4 with scanty very inconspicuous cells, its distal 1/3 to 1/4 surrounded by conspicuous gland cells. Sinus sac 0.190 to 0.250 mm long or about 1/2 total length of prostatic duct; genital atrium short. Ovary transversely oval, immediately posttesticular. Left vitelline gland with 4, right gland with 3, elongate, coiled tubes. Seminal receptacle not observed but Mehlis' gland conspicuous; uterus extending posterior to ovary and entering slightly the ecsoma. Eggs 15 to 17 by 8 to 9 μ. Excretory crura do not unite anteriorly.

Discussion: A new genus was named for this species because it did not quite agree with the characters of any genus as outlined above. Its seminal vesicle and prostatic duct are like *Erilepturus* but it possesses distinct plications, lacks a seminal receptacle, and the excretory crura do not unite. It is like *Magnacetabulum* except that it has distinct prostatic gland cells, a more sac-like seminal vesicle, and less prominent acetabulum. It might be included in *Lecithocladium* except for the bipartite seminal vesicle, two regions of the prostatic duct, and it does not have an elongated pharynx. It differs from *Ectenurus* in that the seminal vesicle is not tripartite.

Generic Diagnosis of Parectenurus: Hemiurids with well developed ecsoma, cuticular plications and tubular vitellaria. Seminal vesicle an elongate sac, bent near its middle; most of prostatic duct with few very indistinct cells; prostatic cells conspicuous around the distal portion of the duct; excretory crura do not unite. Type species: *P. americanus*.



Ectenurus americanus (Manter, 1947)
Manter & Pritchard, 1960

Synonyms: Parectenurus americanus Manter, 1947; *Magnacetabulum americanum* (Manter) Yamaguti, 1954.

Hosts: Caranx bartholomaei (J); **C. crysos* (J); **C. hippos* (J); **Epinephelus striatus* (J); **Selar crumenophthalmus* (J); **Seriola dumerili* (J); **Synodus intermedius* (J).

Site: stomach.

JAMAICA; FROM NANNAS & CABLE, 1964

Ectenurus americanus (Manter, 1947)
Manter and Pritchard, 1960

Parectenurus americanus Manter, 1947.
Magnacetabulum americanum (Manter, 1947) Yamaguti, 1954.

Host: Synodus foetens (3 of 7).
Site: Stomach. Overstreet, 1969

Parectenurus antipodus sp. nov.
Рис. 5 Lebedev, 1968

Хозяин: *Caranx lutescens* (12 вскрытий).
Локализация: желудок.
Место обнаружения: Тасманово море.
Экстенсивность инвазии 15%, интенсивность: 1—4 экз.
Голотип: препарат № НЗ—145А.

Описание. Тело удлиненное, длиной 2,75 *мм*, длина хвостового придатка 0,22 *мм*, максимальная ширина 0,51 *мм*. Кутикула кольчатая, кольчатость прослеживается до конца собственно тела, к заднему концу однако расстояние между кольцами сокращается, у брюшной присоски оно составляет около 0,005 *мм*. Диаметр ротовой присоски 0,19 *мм*, брюшной —0,41 *мм*, последняя лежит в первой трети тела. Соотношение размеров присосок примерно 1 : 2. Фаринкс шаровидный диаметром 0,08 *мм*. Пищевод очень короток, представлен постфарингеальным утолщением, сразу же переходящим в кишечные стволы, достигающие в уровне брюшной присоски в толщину 0,08 *мм*.

Семенники лежат один за другим в задней части второй трети тела. Их размеры: 0,19×0,13—0,16 *мм*. Передний семенник прилегает к основанию семенного пузырька. Семенной пузырек овальный, толстостенный размером 0,36×0,17 *мм*, на части не разделяется. Простатические клетки располагаются двумя группами: крупные простатические клетки лежат в дистальной части семенного пузырька, в базальной части гермафродитной бурсы расположены более диффузные простатические клетки. Простатический проток длиной 1,11 *мм*, впадает в гермафродитную бурсу вместе с маточным протоком на расстоянии 0,34 *мм* от полового отверстия, расположенного у средней линии ротовой присоски. Гермафродитная бурса 0,13 *мм* длиной и 0,04 *мм* шириной, расположена с правой стороны близ ротовой присоски. Яичник продольно-овальный, лежит непосредственно у заднего края второго семенника, размером 0,19×0,17 *мм*. Тельце Мелиса диаметром 0,10 *мм*, расположено между задним семенником и яичником. Левый желточник состоит из четыре[х] [...] из трех изогнутых фолликулярных трубок. Желточный резервуар диаметром 0,06 *мм*. Маточные петли толстые, немного заходят в хвостовой придаток. Яйца мелкие, многочисленные, овальной формы, без крышечки. Их размеры: 0,010—0,015×0,007 *мм*.

Размеры у исследованных экземпляров варьируют крайне незначительно и укладываются в пределы размеров типового экземпляра.

Дифференциальный диагноз. От *P. americanus* Manter, 1947, единственного вида рода, описанного от флоридских рыб из родов *Caranx* и *Synodus*, наш вид отличается несколько бо́льшими размерами, значительно более длинным простатическим протоком, меньшими абсолютными и относительными размерами яиц, а также рядом других менее важных в дифференциальном отношении признаков. Перечисленные различия указывают на видовую самостоятельность *Parectenurus antipodus* sp. nov.

GU CHANGDONG AND SHEN JIWEI, 1978

2. ***Ectenurus carangis*** ~~sp. nov.~~ (fig. 2)

This species differs from most closely resemble species *E. pseudosciaenae* n. sp. in gonads being far apart from the acetabulum, the size of the seminal vesicle being so much larger than the testes, the uterine coils extending into the tail and smaller gs.

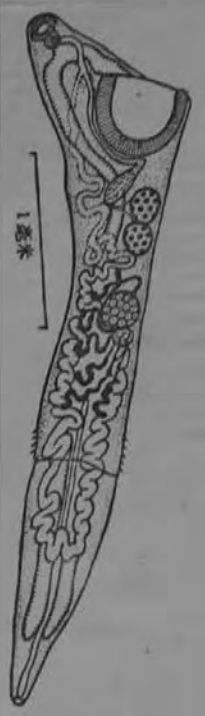


图 2 叶鲹指膜吸虫,新种 *Ectenurus carangis* sp. nov. 的腹面

Ectenurus chloroscombri (S. & C., 1940) new comb

Parectenurus chloroscombri ~~n. sp.~~ (FIGURE 127) Siddiqi & Cable, 1960

Description based on a single specimen with characters of the genus. Body appendiculate, total length 1.982, width 0.393, length without ecsoma 1.400. Cuticular plications well developed ventrally from level of ventral sucker almost to posterior end of body proper. Oral sucker terminal, 0.090 by 0.119; ventral sucker 0.249 by 0.295. Sucker ratio 1:2.6. Prepharynx absent, pharynx 0.066 by 0.071, esophagus short; ceca simple, almost straight in hindbody, extending into ecsoma. Genital pore at posterior border of pharynx. Sinus sac 0.386 long, narrow, extending slightly posterior to ventral sucker; at its base, metraterm and male duct unite to form hermaphroditic duct. Seminal vesicle a curved sac between ventral sucker and anterior testis; with shallow constrictions but not divided into distinct divisions; pars prostatica a compactly coiled tube embedded in prostate cells with ducts entering distal portion of tube. Gonads contiguous; testes 2, entire, 0.068 to 0.083 by 0.121 to 0.158, diagonal, immediately posterior to seminal vesicle. Ovary entire, median, posttesticular, 0.098 by 0.174; seminal receptacle absent. Vitellaria of 7 coiled tubules, in 2 groups of 4 and 3, confined to ovarian and postovarian zone. Mehlis' gland posterior to ovary. Uterus moderately extensive, mostly postovarian, not extending into ecsoma; metraterm simple. Eggs 0.012 to 0.014 by 0.006 to 0.009. Excretory arms ending blindly at sides of oral sucker; excretory pore subterminal.

Host: *Chloroscombrus chrysurus*.

Site: intestine.

Locality: Playa Mani, P. R.

Type specimen: Holotype No. 39397.

The above species is assigned to *Parectenurus* but with some reservations as to the validity of separating that genus from *Dinurus*, *Ectenurus*, and *Magnacetabulum* by the form of the seminal vesicle and distribution of prostate cells along the male duct.

In the length of the sinus sac, *P. chloroscombri* comes closer to *Ectenurus* than *P. americanus* but has an undivided seminal vesicle as in *P. americanus*. *P. chloroscombri* differs from that species in size of body and pharynx, sucker ratio and extent of uterus.

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Parectenurus helicoleni sp. nov. Lebedev, 1968
Рис. 6

Хозяин: *Helicolenus percoides* (сем. *Scorpaenidae*), 14 вскрытий.
Локализация: желудок.
Место обнаружения: Большой Австралийский залив.
Голотип: препарат № НЗ —204.
У одного экземпляра *H. percoides* обнаружено семь экземпляров трематод.

Описание. Трематоды с плотным телом и небольшим хвостовым придатком. Кутикула мелкокольчатая, кольчатость прослеживается до заднего конца собственного тела. Ротовая присоска субтерминальная, предротовая губа отсутствует. Кишечные стволы толстые на всем протяжении тела, пищевод отсутствует. Брюшная присоска с мощной мускулатурой.

Семенники лежат в задней части передней половины тела один за другим субмедианно. Семенной пузырек мешковидный, разделения его на части не наблюдается. Простатическая часть невелика, гермафродитная бурса и половое отверстие располагаются медианно с вентральной стороны на уровне фаринкса. Яичник лежит в середине тела, тельце Мелиса расположено у левого заднего края яичника. Желточник состоит из шести толстых фолликулярных трубок. Петли матки не заходят в хвостовой придаток. Метратерм впадает в гермафродитную бурсу с левой стороны. Яйца многочисленные, округлой формы.

Рис. 6. *Parectenurus helicoleni* sp. nov.

Размеры типового экземпляра. Длина тела 3,18 *мм*, длина хвоста 0,49 *мм*, максимальная ширина 1,01 *мм*. Ротовая присоска 0,34 *мм* в диаметре, фаринкс — 0,12 *мм*. Брюшная присоска диаметром 0,55 *мм*. Семенники: 0,13×0,12 и 0,15×0,13 *мм*. Семенной пузырек 0,33×0,10 *мм*. Простатическая часть размером 0,44×0,11 *мм*. Гермафродитная бурса длиной 0,22 *мм*. Яичник 0,12×0,10 *мм*, тельце Мелиса 0,09×0,03 *мм*, метратерм длиной 0,39 *мм*. Яйца размером 0,027—0,030×0,016—0,019 *мм*.

Изменчивость признаков. Длина собственно тела варьирует в пределах 3,01—3,63 *мм*, максимальная ширина 0,67—1,05 *мм*. Остальные органы имеют размеры, мало отличающиеся или не отличающиеся от типового экземпляра. Размеры яиц укладываются в пределы: 0,025—0,031×0,014—0,019 *мм*.

Дифференциальный диагноз. Сохраняя все характерные для рода *Parectenurus* особенности, описанный вид, однако, весьма отличен от других. Отличия эти заключаются прежде всего в значительно большем развитии простатической части (по сравнению с *P. americanus* и *P. antipodus*, описанному нами на предыдущих страницах), а также величиной яиц. У *P. americanus* они имеют размеры 0,015—0,017×0,008—0,009 *мм*; у *P. antipodus*, как уже говорилось, 0,010—0,015×0,007 *мм*, у *P. helicoleni* —0,025—0,031×0,014—0,019 *мм*. Указанных отличий вполне достаточно для выделения описанных трематод в самостоятельный вид *Parectenurus helicoleni* sp. nov.

Ectenurus leiognathi (Yam., 1953) Manter & Pritchard, 1960

Syn 25. *Magnacetabulum leiognathi* n. sp. Yamaguti, 1953.
Pl. I, Fig. 3.

Habitat. Stomach of *Leiognathus dussumieri* (Cuv. et Valenc.).

Material and locality. A single specimen fixed in acetic sublimate under cover slip, stained and mounted as usual; Macassar.

Body elongate, with comparatively long tail; body proper 1.65 mm long, 0.43 mm wide at posterior end of uterus; cuticular denticulations from immediately behind acetabulum as far back as vitellaria. Tail about 1.0 mm long, smooth, with its blunt-pointed posterior portion invaginated into itself. Preoral lobe 15 μ thick. Oral sucker subterminal, subglobular, 90×98 μ; pharynx also subglobular, 51×63 μ. Esophagus directed posterodorsally, about 60 μ long. Ceca turning backward at right angles, where the right one shows a small bulb due to contraction; both terminating in anterior portion of tail. Acetabulum prominent, near anterior extremity, measuring 0.25 mm anteroposteriorly and 0.225 mm dorsoventrally.

Testes oval, obliquely tandem behind acetabulum, about 0.105 ×0.13 mm. Vesicula seminalis longitudinally elongated, reaching to dorsal side of anterior testis, 25 μ wide, with two not very conspicuous constrictions, tapering anteriorly to a long narrow duct running straight forward dorsal to the acetabulum. Pars prostatica about 80 μ long by 5 μ wide, surrounded by prostate cells, not marked off from the above mentioned duct of the seminal vesicle. Ductus hermaphroditicus narrow, tubular, about 90 μ long by 8 μ wide, extending from immediately behind intestinal bifurcation to ventral side of pharynx, enclosed in a very thin membranous capsule, opening into genital atrium, which is cylindrical, about 60 μ

long by 15 μ wide, and opens to the outside close to the midventral margin of the oral sucker.

Ovary ovoid, 0.1×0.15 mm, situated ventrally at about middle of body proper, overlapping posterior testis at its anterior end. Vitellaria consisting of seven winding tubular lobes, (three on the right and four on the left); one each of the two groups is directed forward dorsolateral to the ovary, while all the remaining ones embracing the proximal descending portion of the uterus are directed posterodorsally. The descending uterus is strongly coiled behind the vitellaria and do not enter the tail; the ascending uterus runs sinuously near the dorsal cuticle, but finally straight alongside the duct of the seminal vesicle and the pars prostatica. Eggs elongate oval, thin-shelled, embryonated, 21–24×11–13.5 μ. Excretory arms terminating immediately behind oral sucker without uniting with each other.

This species differs from the only known genotype in the acetabulum being not so large in relation to the oral sucker, in the shape of the seminal vesicle, etc. The terminal genital ducts are similar to those of the genotype which are illustrated in Fig. 31 in my paper of 1942, though the hermaphroditic duct is much slender in the present species.

158. *Ectenurus lepidocybii* n. sp. Yam., 1970
(Fig. 157)

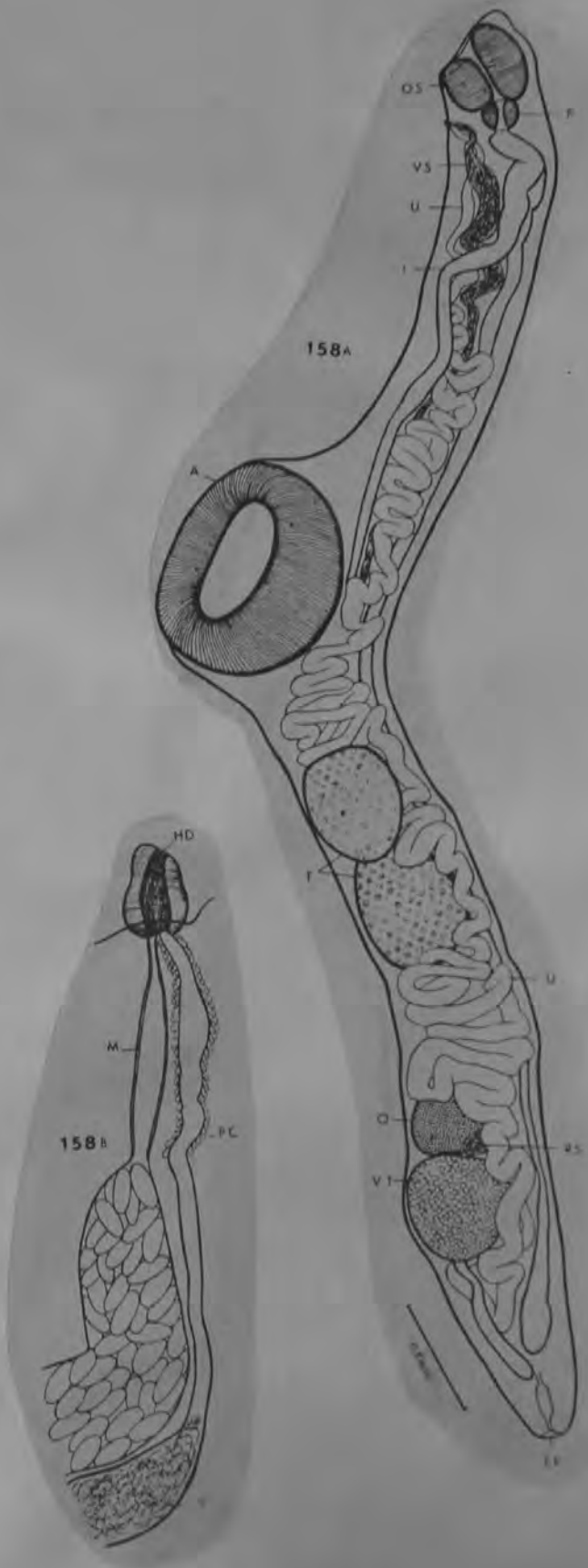
HABITAT: Stomach of *Lepidocybium flavobrunneum*; HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63750. DESCRIPTION (based on a single whole mount): Body robust, about 12 mm in total length including tail which is 5.9 mm long by 1.0 mm wide, up to 2.0 mm wide at testiculo-ovarian level. Cuticle thick, smooth. Oral sucker 0.85 X 0.85 mm, subterminal, with wide quadrangular aperture about 0.4 mm wide, surmounted by preoral lobe. Pharynx ovoid, 0.26 X 0.25 mm; esophagus very short; ceca curved at right angles at level of intestinal bifurcation, terminating 0.3 and 0.4 mm respectively from tail end. Acetabulum 0.78 X 0.84 mm, with comparatively small circular aperture 0.32 mm in diameter, situated about middle of anterior third of body.

Testes subglobular, 0.45-0.5 X 0.5-0.65 mm, obliquely tandem at posterior part of anterior third of body. Seminal vesicle tubular, convoluted behind acetabulum; the duct connecting the seminal vesicle with the pars prostatica is narrow (30 μ wide) and straight; pars prostatica 0.6 mm long by 40 μ wide, surrounded by dense layer of prostate cells, united with metraterm at level of intestinal bifurcation to form a cylindrical hermaphroditic duct about 0.5 mm long. This duct, enclosed in sheath-like hermaphroditic pouch of longitudinal muscles, opens into the cylindrical genital atrium 0.35 mm long, which in turn opens outside ventral to the oral sucker.

Ovary ovoid, 0.45 X 0.6 mm, situated slightly dextral to median line, separated from posterior testis by heavy uterine coil. Vitellaria consisting of seven, long, winding tubules (three on right and four on left), of which two are directed forward and the other four backward, the two most posteriorly extending tubules terminating in anterior part of tail. Uterine coils descending further backward than these two vitelline tubules, ascending on the left of vitellaria, then describing a very thick sigmoid curve in postacetabular region, overlapping ovary, testes, and seminal vesicle; metraterm wide, running forward along male duct from left side of acetabulum. Eggs oval, very thick-shelled, 15-21 X 9-14 μ in life. Excretory arms not uniting anteriorly.

DISCUSSION: This species differs from the most closely related *Ectenurus americanus* (Manter, 1947) Manter et Pritchard, 1960 in the shape of the seminal vesicle and in the very thick-shelled eggs.

Yam., 1970.



GU CHANGDONG AND SHEN JIWEI, 1978

3. ***Ectenurus megalaspis*** ~~**sp. nov.**~~ (fig. 3)

This species is characterized by the smallest size of the body, and by having the prostate cells are invisible.

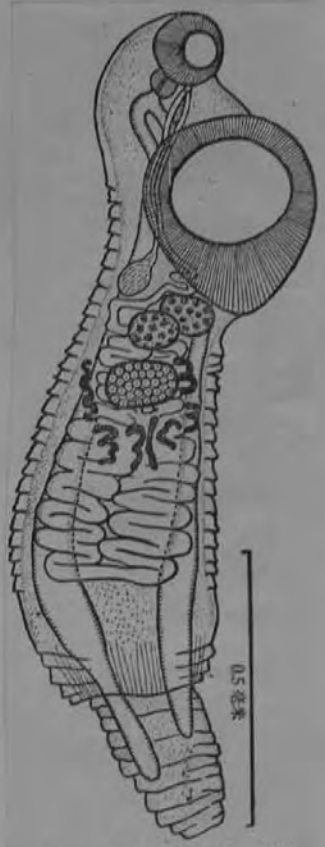


图3 大甲鲹褶膜吸虫，新种
Ectenurus megalaspis sp. nov.
的腹面

Ectenurus miuutus new species ZAIDI AND KHAN, 1977

(Fig. 26)

Host: *Caranx sansun* (Forskal)
Location: Intestine
Locality: Karachi Coast (Arabian Sea)

The following description is based on three specimens collected from the intestine of *Caranx sansun* (Forskal) caught near Karachi Coast in January, 1968. Eight specimens of this fish were examined, out of these only two yielded these worms.

Description

The body of the worm is elongated and slightly attenuated at the anterior end and is covered by strongly annulated tegument. A distinct tail is present with its proximal part invaginated into the body. The maximum width is in postovarian region. The oral sucker is subterminal, with preoral lobe. The prepharynx is absent. The pharynx is fairly developed and is nearly as long as broad. The oesophagus is short. The intestinal limbs are long and extend into the tail terminating a short distance in front of the posterior end. The acetabulum is large and is rounded in outline. It is situated at about a third of the body length from the anterior end.

The testes are somewhat triangular, diagonal and almost equatorial in position. They are entire in outline. The vesicula seminalis is saccular, elongated and is divided into two parts distinctly. The ovary is median near the posterior border of the middle third of the body and is oval in shape, with entire margins. The vitellaria are in form of seven winding tubular lobes extending from posttesticular to postovarian region. The uterus extends from the region of acetabulum into the proximal part of the tail. The genital pore is in the vicinity of the pharynx. The eggs are small, numerous and are yellow in colour.

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Measurements (In Mm.)

Body length	1.379-1.479
Body width	0.260-0.305
Oral sucker	0.167-0.177 × 0.098-0.137
Preoral lobe	0.069-0.070
Ventral sucker	0.148-0.167 × 0.148-0.167
Ventral sucker from anterior extremity	0.266-0.286
Anterior testis	0.079-0.099 × 0.118-0.138
Posterior testis	0.079-0.099 × 0.118-0.0138
Ovary	0.118-0.120 × 0.079-0.099
Tail fully evaginated	0.394-0.310 × 0.099-0.100
Eggs	0.018-0.020.0 × 010-0.012.

Discussion

The species under study can be readily separated from all previously known species in being considerably smaller, in having a proportion of nearly 1:1 between its two suckers, in the extent of its uterus, and in the location of its testes in relation to the acetabulum. In view of above discussion the species under study is regarded as new and the name *Ectenurus minutus* is proposed for it.

GU CHANGDONG AND SHEN JIWEI, 1978

4. *Ectenurus pseudosciaenae* ~~**sp. nov.**~~(fig. 4)

This species agrees well with *E. carangis* sp. nov. but differs from the latter in the size of the body and the seminal vesicle as well as the eggs. Its uterine coils do not extend into the tail. The host is also worthy of note.

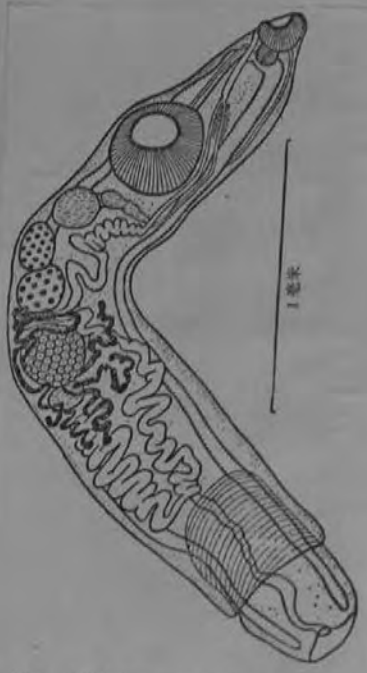


图 4 大黄鱼褶膜吸虫，新种 *Ectenurus pseudosciaenae* sp. nov. 的腹面

USNM, #

Ectenurus virgula sp. nov. (Fig. 148.) Linton, 1910

This species, according to Pratt's Synopsis, belongs to the genus *Lecithocladium*. When one attempts to give it a place among the numerous genera established by Looss (Beitrag zu Syst. d. Dist.) it must be placed in or near the genus *Ectenurus*, on account of the 2 lateral eminences (fig. 148 *n*) situated on the dorsal side of the neck above the pharynx.

The following description is based on specimens mounted in balsam:

Body cylindrical to fusiform with transverse rings making a sharp serrate outline which is most conspicuous on the ventral side, where it continues caudad to about the base of the appendix, very faint on the dorsal side; appendix approximately one-third of the entire length; neck short, its diameter much less than that of the body, with 2 slight eminences dorsal to pharynx; ventral sucker prominent, 2.5 times the diameter of the oral sucker; pharynx subglobular, adjacent to oral sucker, rami of intestine extend into the appendix. Genital aperture ventral, median, at posterior margin of oral sucker; cirrus slender, about as long as the diameter of the ventral sucker; cirrus-pouch dorsal to ventral sucker, prostatic portion rather small and inconspicuous, somewhat variable in position but always behind the ventral sucker, its long axis coinciding nearly with the long axis of the body. Seminal vesicle divided usually into 3 parts, which, in most cases, increase in size posteriorly, the anterior division ellipsoidal, the others subspherical, the whole vesicle surrounded by a definite muscular wall. There is considerable variation shown by the seminal vesicle. Testes 2, close together, one behind the other, just back of the seminal vesicle and with but a short interval between the posterior one and the ovary, somewhat variable in shape but in the main subglobular; in some cases equal, in others the posterior is the larger. Ovary near, in some cases, touching, the posterior testis; in some cases larger, in others equal to, and in others smaller, than the posterior testis, usually ellipsoidal with longer axis transverse to the long axis of the body. Yolk-glands tubular, lying beside the ovary and extending a little way both in front and behind the ovary. In one case there appeared to be only 2 of these tubular glands. In others there were more, possibly as many as 4. The yolk-glands are much convoluted and consequently difficult to make out. The seminal vesicle, testes, ovary, and yolk-glands are all ventrally situated. The folds of the uterus for the most part lie dorsal to the other genitalia and behind them, extending as far back as the base of the appendix. The metraterm was not seen satisfactorily. It appears to lie dorsal to the base of the cirrus-pouch, thence it was traced along the left side of the cirrus-pouch to the base of the retracted cirrus. The excretory vessels do not show distinctly in the mounted specimens, but it could be made out that they end blindly lateral to the oral sucker.

Dimensions, life, flattened: Length 3; diameter 0.5; oral sucker 0.15; pharynx 0.08; ventral sucker 0.38; ova 0.017 by 0.008.

Host, *Clupanodon pseudohispanicus:* July 10, 1906, numerous.

Q. *Family HEMIURIDAE Lühe, 1901*

Ectenurus virgulus Linton, 1910

Hosts.—*Harengula clupeola* (Cuvier), big-eyed sardine; *Selar crumenopthalmus* (Bloch), goggle-eyed scad.

Location.—Stomach.

Locality.—Off Lerner Laboratory pier, N. Bimini, B.W.I. [new locality record].

Sogandares, 1959

Ectenurus virgulus Linton, 1910

Hosts: **Caranx bartholomaei* (J); **C. hippos* (J); **Priacanthus cruentatus* (C); *Sardinella macrophthalmus* (J); *Selar crumenophthalmus* (J); **Trachinotus glaucus* (J).

Site: intestine.

CURAÇAO + JAMAICA; FROM NAHHAS + CABLE, 1964

* check further

Ectenurus virgulus Linton, 1910

Hosts: *Caranx crysos* (1 of 2)*; *Caranx hippos* (1 of 3). Florida

Site: Stomach. Overstreet, 1969

—over—

Ectenurus virgulus LINTON, 1910.

HOST : *Selar crumenophthalmus* (BLOCH) (Carangidae).
SITE : Digestive tract.
LOCALITY : Gorée, Senegal.
DATE : 17 December 1953.
SPECIMEN DEPOSITED : USNM Helm. Coll. No. 71885.

DISCUSSION : Our collection consists of one adult worm. This trematode has been reported from a variety of marine fishes from Ghana, Red Sea, Gulf of Aden, U. S. Atlantic, Gulf of Mexico, Bahama, Bimini, Jamaica, and Curaçao.

From Fischthal and Thomas, 1972

***Ectenurus virgulus* Linton, 1910**

HOSTS: **Caranx africanus* Steindachner, African horse mackerel, *C. crysos* (Mitchill), Jack or horse mackerel, **Trachinotus glaucus* (Carangidae).

HABITAT: Stomach.

LOCALITY: Cape Coast, Ghana.

SPECIMENS DEPOSITED: USNM Helm. Coll. Nos. 71690–71692.

DISCUSSION: The differences cited by Manter (1947) between this species and *Ectenurus lepidus* Looss, 1907, were noted in our material. The padlike thickenings on the anterodorsal part of the body were prominent on all but a few of our specimens. Comparison of our worms with some of the original specimens collected by Linton (1910) from *Clupanodon pseudohispanica* (Poey) (Dorosomidae) from Tortugas, Florida (USNM Helm. Coll. No. 1508) show them to be basically similar. *E. virgulus* has been reported from a variety of marine fishes from the U. S. Atlantic, Gulf of Mexico, Bahama, Bimini, Bermuda, Jamaica, Curacao, and Argentina.

FROM FISCHTHAL AND THOMAS, 1971

Ectenurus virgulus Linton 1910

Host: *Caranx crysos*
Site: Stomach
Locality: Pensacola Bay, Florida

From Nahhas and Powell, 1971

Ectenurus **yamagutii** ~~new species~~ Nahhas and Powell, 1971

Figure 2

Hosts: *Caranx crysos*, *C. hippos*, and *Lagodon rhomboides*
Site: Stomach
Localities: Pensacola Bay; Santa Rosa Island
Holotype: U.S.N.M. Helm. No. 70734

Description (based on 10 specimens): Body appendiculate; soma 0.770–1.560 long, 0.209–0.286 wide at level of ovary; ecsoma 0.220–0.484 long, 0.204–0.253 wide. Tegumental plications encircle body anteriorly, extending from anterior end of body to posterior end of middle third of soma ventrally and almost to posterior end of soma dorsally. Oral sucker 0.055–0.075 in diameter, surmounted by a preoral lobe. Prepharynx absent. Pharynx 0.038–0.045 long by 0.045–0.050 wide. Esophagus about as long as pharynx. Ceca extending to near posterior end of ecsoma. Acetabulum at anterior third of soma, 0.135–0.187 in diameter; sucker ratio 1:2.45–2.80.

Genital pore ventral, at anterior level of pharynx. Sinus sac long, well-developed, extending down to anterior level of acetabulum; hermaphroditic duct well-developed with muscular wall, free in sinus sac. Testes in middle third of body, diagonal, smooth in outline, 0.088–0.110 in diameter. Seminal vesicle tripartite, posterior to posterodorsal to acetabulum. Prostatic duct with conspicuous prostatic cells around distal third or half, entering posterior end of sinus sac. Ovary, posttesticular, smooth in outline, 0.063–0.100 in diameter. Uterus entering ecsoma or not, joining prostatic duct at base of sinus sac. Eggs 17–20 by 7–10 microns. Vitellaria immediately postovarian, in two groups of four and three digitiform lobes; lobe length 2–4 times width. Excretory arms not uniting anterior to oral sucker.

The single most important characteristic of this species which distinguishes it from others in the genus is the short digitiform vitellaria. In this feature, *Ectenurus yamagutii* differs not only from other ectenurids, but perhaps from all other members of the subfamily Dinurinae. On this basis, a separate genus may be justified, but because of its strong resemblance in other ectenurid features we prefer to retain it in *Ectenurus*.

This species is named in honor of Dr. Satyu Yamaguti in recognition of his contributions to helminthology.

Fig. 2

GU CHANGDONG AND SHEN JIWEI, 1978

5. ***Ectenurus zonichthyi*** ~~**sp. nov.**~~ (fig. 5)

This species is characterized by the long tail, the caeca extending into the end of the tail, and also by the shape of the ovary, the position of the vitellaria. The host is also worthy to be noted.

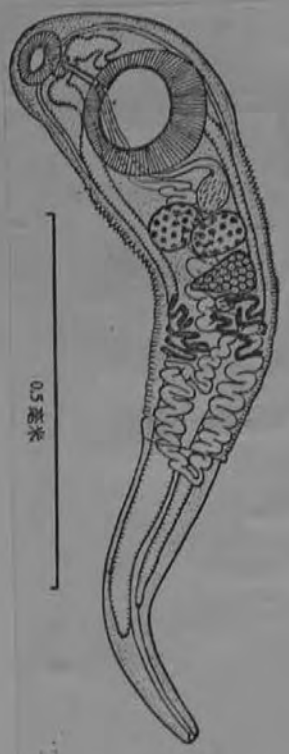
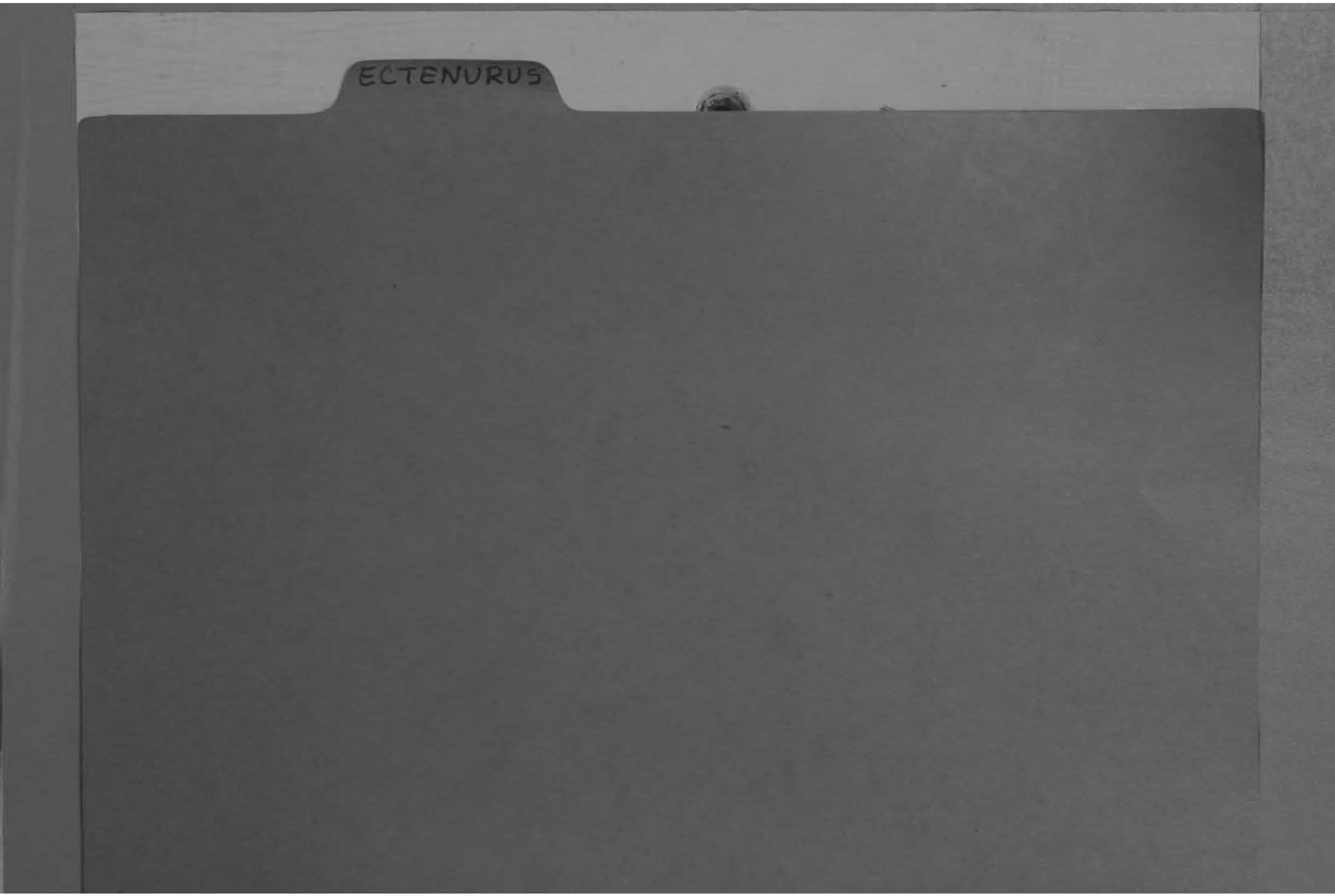


图5 条帆鳍膜吸虫，新种 *Ectenurus zonichthyi* sp. nov. 的腹面


ECTENURUS

vol. 10 (1955)

Skrjabin diagnosis of Elytrophallidae: Skr. & Gnedi. 1954

Hemiurata with caudal appendage. Cuticula of body smooth. Genital opening found ventral to oral sucker. Vitellaria single, consisting of seven tubular ##### blades. Seminal vesicle with thick muscular wall. Hermaphroditic ..... system consisting of four parts: proximal hermaphroditic duct, thin-walled hermaphroditic sac, hermaphroditic metraterm in genital atrium. Lateral branches of excretory bladder unite dorsally at level of pharynx.

Type and for the present only genus: Elytrophallus Manter, 1940

Elytrophallus Manter, 1940[1])

Generic diagnosis. — Hemiuridae, Dinurinae: Body elongate, smooth, with tail. Oral sucker subterminal; pharynx small, esophagus short, ceca may or may not enter tail. Acetabulum larger than oral sucker, near anterior extremity. Testes diagonal, close together, a short distance posterior to acetabulum. Seminal vesicle saccular, thick-walled, not distinctly divided, just pretesticular. Pars prostatica sinuous, entirely postacetabular, with prostate cells moderately developed. Ductus hermaphroditicus very long; its pre-acetabular anterior portion is convoluted and enclosed in a thin-walled sac, while its straight posterior portion lying dorsal to the acetabulum is enclosed in a sheath. Genital atrium [2]) tubular, muscular throughout except for its distal end opening ventral to oral sucker. Ovary in middle third of body. Vitellaria of seven rather thick tubular lobes. Receptaculum seminis small, Laurer's canal absent. Uterus may or may not extend into tail. Excretory arms uniting dorsal to pharynx. Stomach parasites of marine fishes.

[1]) Skrjabin and Guschanskaja (1954) separated this genus as representing a new family Elytrophallidae.

[2]) Based on my own examination of Manter's specimens deposited at the Parasite Laboratory, A. R. C., Beltsville. I regard "the third and fourth regions of the sinus tube" of Manter as genital atrium.

Genotype: *E. mexicanus* Manter, 1940 (Pl. 24, Fig. 306), in ***Lutianus viridis***, *Paranthias furcifer*, *Epinephelus* sp., ***E. labriformis***, ***Caranx lugubris***, *Zalocys stilbe*, *Mycteroperca* sp., Socorro and Clarion Island, Mexico, and James Island, Galapagos.

?Elytrophallus sp.

Data based on one incompletely developed metacercaria. Body 951 long, smooth, with short, retracted ecsoma. Oral sucker folded during fixation, approximately 90 wide. Acetabulum 177 long by 180 wide. Forebody 22 % of body length. Pharynx 81 long by 70 wide. Oesophagus short. Ceca extending to near posterior end of body. Testes diagonal; left testis 41 μm post-acetabular, 29 long by 61 wide; posterior testes dextral, genital pore submedian, dextral, at pharyngeal level; genital sinus extending posteriorly to short distance beyond pharyngeal level. Sinus sac extending from genital sinus diagonally almost to mid-acetabulum at left side; containing non-coiled, muscular sinus organ. Pars prostatica not fully developed, sinuous, joining uterus and muscular, saccular seminal vesicle near posterior border of acetabulum. Ovary short distance posterior to right testis. Vitellaria incompletely developed. Excretory arms apparently uniting anteriorly.

Host: *Japetella heathi* (Berry, 1911).

Site: Stomach.

Incidence and locality: one worm in 1 of 24 octopods (11–90 mm DML) from Gulf of California, La Pas Basin, Mexico, 24°20′ N; 110°05′ W, between 0–400 m.

Discussion

The structure of the terminal genitalia, though incompletely developed and difficult to interpret, forms the basis for this tentative identification. Additional specimens from *Japetella heathi* should provide necessary material to confirm or reject the identification.

From Overstreet and Hochberg Jr, 1975

GENERIC DIAGNOSIS OF ELYTROPHALLUS MANTER, 1940

Smooth-bodied, tailed Hemiuridae. Subfamily Dinurinae. Acetabulum large, in anterior half of body. Genital pore ventral to oral sucker. Seminal vesicle ovoid, thick walled, not distinctly divided. Pars prostatica fairly short, sinuous, with prostatic cells moderately developed. Ductus hermaphroditicus exceedingly long with 4 regions more or less evident: a long, straight posterior portion; a thinner-walled distensible portion within which the sinus tube is usually coiled; a straight, very muscular portion within which the sinus tube may be extended; and a thin-walled genital atrium. Vitellaria of 7 rather thick tubes, thicker terminally. Small seminal receptacle present; Laurer's canal absent. Branches of excretory vesicle uniting dorsal to pharynx. Type species: *E. mexicanus*.

The name Elytrophallus is from *elytro* (= sheath) and *phallus* (= penis). It refers to the sheathlike manner in which the sinus sac encloses the sinus tube. The name *mexicanus* is for the locality.

Discussion. This trematode reveals a combination of characters known in several genera. The smooth body, the rather small tail appendage, and the form of the vitellaria all suggest the genus Sterrhurus. But the seminal vesicle, the tubular pars prostatica, and especially the long tubular form of the sinus sac are very different from Sterrhurus. Tubovesicula Yamaguti, 1934 has a smooth body but a larger tail, a very long pars prostatica, and a short pyriform sinus sac. These differences also hold for Culpenurus Srivastava, 1935, a genus which probably should be considered a synonym of Tubovesicula. Lecithocladium Lühe has a long slender sinus sac and a genital pore near the mouth, but it has a ringed body, long tubular vitellaria, and usually a very long pars prostatica. Dinurus Looss has a ringed body, long tubular vitellaria, distinctly tripartite seminal vesicle, and lacks the ventral spherical swelling of the esophagus. Elytrophallus is similar to Erilepturus Woolcock, 1935 in some respects, especially in the seminal vesicle and in that the ringed condition is practically lacking in Erilepturus. Erilepturus, however, has a more posterior acetabulum, a more posterior genital pore, a different pars prostatica which is preacetabular and separated from the seminal vesicle, and a shorter sinus sac. The sphincters of the sinus sac figured by Woolcock seem to divide the common genital tube into somewhat similar but less evident regions, as have been noted in Elytrophallus.

Elytrophallus is perhaps most like Erilepturus. Woolcock correctly minimizes the subfamily significance of cuticular plications or rings. As a consequence it becomes increasingly difficult to separate the Sterrhurinae from the Dinurinae. Elytrophallus is considered in the subfamily Dinurinae chiefly because of the length of the sinus tube, the tubular pars prostatica, and the shape and position of the seminal vesicle.

FROM: [illegible]

This genus is similar to Glomericirrus Yamaguti, 1937 except that the vitellaria are in 7 long lobes rather than compact or slightly lobed and in that the body is smooth rather than ringed. The differences are like those between Sterrhurus and Hemiuus.

Key to species of *Elytrophallus* from Hawaiian fishes

1. Acetabulum very large 2
   Acetabulum not very large 3
2. Sucker ratio 1 : 3.2-4.0; body 2.2-4.3 mm long . . . . . *E. decapteri*
   Sucker ratio 1 : 2.6-3.3; body 1.9 mm long . . . . . *E. mulloidichthydis*
3. Body 1.5-2.7 mm long; parasitic in *Holocentrus* . . . . . *E. holocentri*
   Body 2.5-3.5 mm long; parasitic in *Fistularia* . . . . . *E. fistulariae*

Yam., 1970.

163. *Elytrophallus decapteri* n. sp. Yam., 1970
(Fig. 163)

HABITAT: Stomach of *Decapterus maruadsi* (local name "opelu"); Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63755.

DESCRIPTION (based on ten whole mounts): Body elongate, 2.2-4.3 mm in total length including tail which is 0.57-0.9 mm long; forebody abruptly tapered anteriorly; hindbody cylindrical, 0.4-0.5 mm wide. Cuticle may be papillated in forebody. Oral sucker subterminal, 0.11-0.15 × 0.14-0.18 mm, may be papillated on its anterior margin; prepharynx almost absent; pharynx 60-90 × 60-90 μ; esophagus very short, muscular; ceca swollen in some places, entering tail, but not reaching its posterior end. Acetabulum very large, bowl-shaped, 0.32-0.5 × 0.45-0.6 mm, may be papillated on anterior margin occasionally, situated about middle of anterior third of body or a little more posteriorly. Sucker ratio 1 : 3.2-4.0.

Testes subglobular, obliquely contiguous, in equatorial or pre-equatorial region. Seminal vesicle elliptical, 0.15-0.3 × 0.07-0.1 mm, provided with thick wall of oblique longitudinal muscles, lying immediately in front of anterior testis. Pars prostatica surrounded by prostate cells, sigmoid or looped, 0.17-0.3 × 0.018-0.03 mm, joining metraterm shortly behind acetabulum to form hermaphroditic duct. This duct (sinus organ of Manter) very long, 14-20 μ wide, muscular, enclosed in a sheath of longitudinal muscles posteriorly, but more or less winding in genital sinus. Genital sinus very long, 0.55-0.65 mm long, 30-50 μ wide, consisting of delicate membranous layer of fine longitudinal muscle fibers, extending from dorsal side of acetabulum to genital pore which lies ventral to the oral sucker near its anterior margin.

Ovary subglobular, ventral, 0.1-0.18 × 0.13-0.22 mm, nearly equatorial. Seminal receptacle small, immediately behind ovary. Vitellaria consisting of seven, winding, tubular lobes, measuring as a whole 0.16-0.32 mm anteroposteriorly. Uterus first descending near ventral cuticle to base of tail, into which it usually does not intrude, and where it turns forward to take dorsal ascending course and occupy most of space dorsal to gonads; metraterm short, opening into base of hermaphroditic duct, 0.4 mm posterior to acetabulum in the type. Eggs elliptical, 14-17 × 7-9 μ in life. Excretory pore terminal; arms united dorsal to oral sucker.

DISCUSSION: This species differs from the most closely related *Elytrophallus mexicanus* Manter, 1940, from the Mexican coast of the Pacific and the Galapagos, in body length and sucker ratio. In Manter's original specimens the sucker ratio is 1 : 3, and in the Hawaiian representatives from *Pseudupeneus*, assigned by Manter and Pritchard (1960) to *E. mexicanus*, it is 1 : 2.4-2.5, whereas in the present species the acetabulum is 3.2 to 4 times as wide as the oral sucker. The fact that the oral sucker and acetabulum may or may not be papillated on the anterior margin shows that this character is of no specific significance.

YAM., 1970

Elytrophallus mexicanus, new genus, new species MANTER, 1945

(Plate 46, figs. 105-107)

Hosts: *Lutianus viridis* (Val.) ? (type host)
Paranthias furcifer (Cuv. and Val.)
Epinephelus sp.
Epinephelus labriformis (Jenyns)
Caranx lugubris Poey ?
Zalocys stilbe Jordan and McGregor
Mycteroperca sp.

Location: Stomach

Locality: All collections were from Socorro or Clarion Island, Mexico, except for a few specimens from 2 *Paranthias furcifer* from James Island, Galapagos. The trematode is very common at Socorro and Clarion. Three of 4 specimens of *P. furcifer* contained it in that region, but only 2 of 6 specimens of this same host were infected in the Galapagos region.

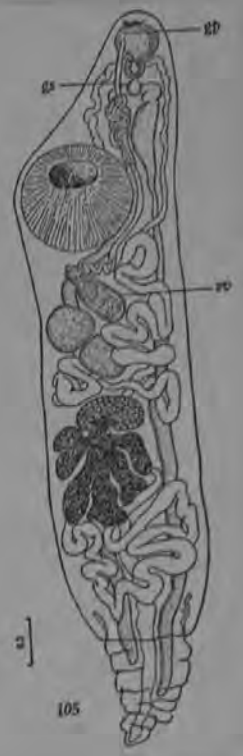
Number: Common in the above hosts at Clarion and Socorro islands. Collected there 8 times.

SPECIFIC DIAGNOSIS OF ELYTROPHALLUS MEXICANUS

Body smooth, elongate, cylindrical, with protrusible ecsoma; body itself 1.125 to 2.025 in length, tail may be extended up to 0.487 to make a total length up to 2.323; greatest width 0.292 to 0.487, usually at acetabular level, sometimes near posterior end of body. Forebody 0.232 to 0.435 (about 1/5 body length). Oral sucker subterminal, 0.090 to 0.127 in diameter. Acetabulum circular, 0.244 to 0.397 in diameter. Sucker ratio close to 1:3. Genital pore far anterior, median or submedian, ventral to oral sucker, only a short distance posterior to mouth. Pharynx usually slightly wider than long, 0.039 to 0.053 in length, 0.044 to 0.053 in width; esophagus spherical, saclike, sharply defined, ventral, rather distinct from intestinal ceca which arise from its dorsal side; ceca diverging then turning posteriorly, sometimes entering ecsoma, sometimes not. Testes subspherical, diagonal, close together, a short distance posterior to acetabulum. Seminal vesicle a thick-walled, elongate or ovoid sac lying close to and overlapping anterior testis; an indistinct tripartite appearance (fig. 106), sometimes evident within the vesicle [a condition similar to that described by Woolcock (1935, p. 321) for *Erilepturus tiegsi*]. Pars prostatica sinuous, usually forming a posterior loop and always overlapping anterior end of vesicle, entirely postacetabular, not reaching appreciably anterior to seminal vesicle; prostatic cells present but not profusely developed. Pars prostatica and a short narrow portion of uterus uniting posterior to acetabulum to form a very long tubular ductus hermaphroditicus or genital sinus enclosed in a sinus sac. Sinus tube almost or quite 1/3 body length, divided into 4 regions as follows: a narrow, almost straight region slightly wider at its base, extending past acetabulum, sinus sometimes with somewhat convoluted inner wall in anterior part of this region, but tube is uncoiled. Just anterior to acetabulum occurs a thin-walled, usually expanded region of the sac within which the muscular sinus tube often becomes greatly coiled (fig. 107). This region is more or less separated by a constriction at its posterior end and sometimes appears to be partially divided near its middle. The penislike sinus tube is very evidently flexible and capable of protrusion; its tip end can usually be seen in this saclike portion of the sac; in a few specimens it is extended into the next anterior and more muscular region. This muscular region of the sac is long and straight, extending almost to the genital pore. It measures 0.127 to 0.170 in length. The fourth region is a short, thin-walled, tubular genital atrium leading to the genital pore.

Ovary ovoid, transversely extended, not far posterior to testes, about in middle of hindbody. Vitelline lobes fairly thick and of medium length, thickened at tips with some slight indication of branching (fig. 105). Seminal receptacle very small, embedded in Mehlis' gland. Laurer's canal lacking. Uterus may or may not send a loop into ecsoma. Eggs thin shelled, elongate, 14 to 17 by 6 to 8 μ. Eggs were seen within the ductus hermaphroditicus and even in the sinus sac outside the ductus. Excretory vesicle forking at base of seminal vesicle; branches uniting dorsal to pharynx.

Hemiuridae



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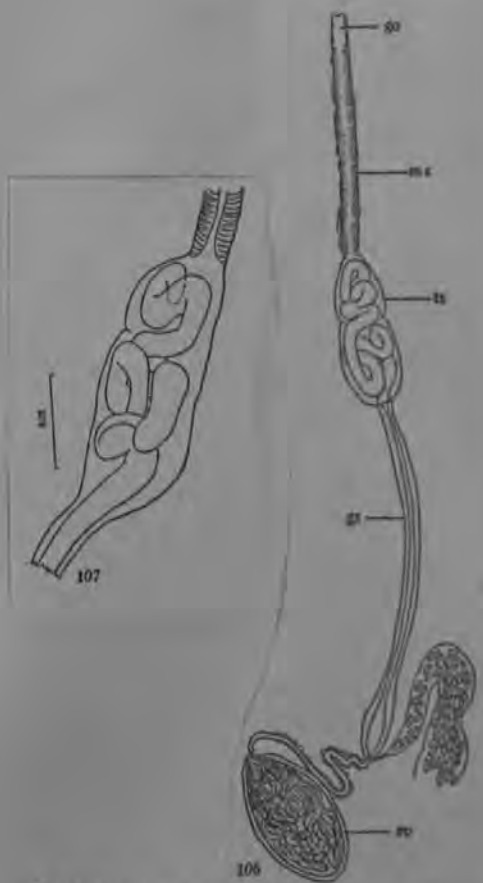

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107

Elytrophallus mexicanus Manter, 1940 (Figs. 13-14)

HOSTS: *Pseudupeneus multifasciatus* (Quoy and Gaimard), locally known as moana or moano, the red and black banded goatfish (Mullidae); 1 each from 4 of 20 hosts. New host record.

P. chrysoneus Jordan and Evermann, a goatfish (Mullidae); 1 from 1 of 23 hosts. New host record.

LOCATION: Intestine.

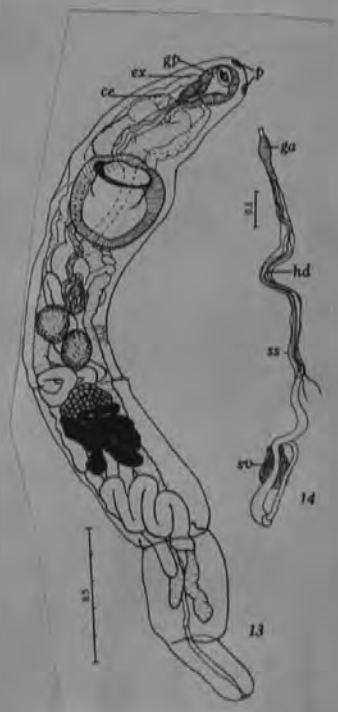
DISCUSSION: These specimens agree in general with the original description. A few differences are: the sucker ratio is 1:2.4 to 2.5 as compared with 1:3; the loop from the seminal vesicle extends as far back as the posterior testis; the hermaphroditic duct may be sinuous dorsal to the acetabulum and does not become extensively coiled in any of the 5 specimens; the distal end of the duct lies free in the sinus sac or may extend into the atrium; the genital atrium is muscular most of its length but is thin-walled near genital pore (Fig. 13); eggs are slightly smaller, 11 to 14 by 6 microns.

A restudy of 25 paratypes in Manter's collection disclosed that the differences in the terminal ducts noted above also appeared in some of the paratypes. Specimens from all localities bear a pair of papillae on the preoral lobe (Fig. 13). As Yamaguti (1958) has noted, the label "ms" in Manter's (1940) Fig. 106 refers to a muscular portion of a long, tubular genital atrium, not to a "metraterm sac."

This species is known from 7 different hosts along the Mexican Coast and Galapagos, from *Paralabrax clathratus* at LaJolla, California, as well as from goatfishes in Hawaii.

Skrjabin and Guschanskaja (1954) named the family Elytrophallidae for this genus, basing it largely on the terminal genital ducts. Although the hermaphroditic duct is long and lies free in its sac, the system is basically a sinus sac enclosing a tubular hermaphroditic duct and connecting with a genital atrium. We believe the genus may be included in the Lecithochiriinae.

From Manter & Pritchard 1960



From Manter, 1969

164. *Elytropballus fistulariae* n. sp. Yam., 1970
(Fig. 164)

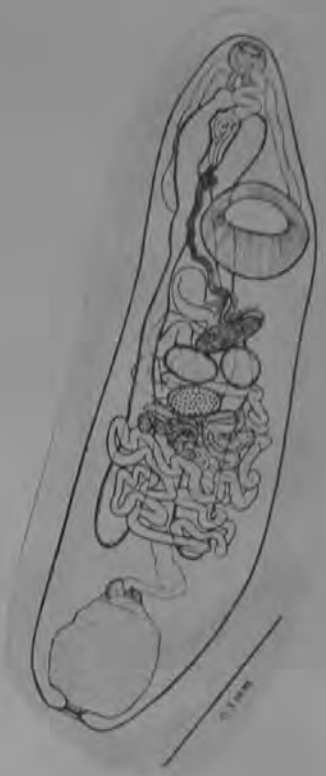
HABITAT: Stomach of *Fistularia petimba*; Hawaii.
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63756.
DESCRIPTION (based on five whole mounts): Body elongate, 2.5-3.5 mm long; forebody tapering anteriorly; hindbody cylindrical, truncate at posterior extremity; tail usually completely retracted. Cuticle smooth. Oral sucker spherical, 0.1-0.13 × 0.12-0.15 mm, surmounted by inconspicuous preoral lobe, directly followed by barrel-shaped muscular pharynx 50-70 μ long by 50-80 μ wide; esophagus very short; ceca terminating near posterior extremity, without entering tail. Acetabulum 0.34-0.45 mm in transverse diameter, situated immediately behind middle of anterior third of body. Sucker ratio 1 : 2.5-3.0.

Testes subglobular, directly tandem or nearly juxtaposed, close to each other, 0.1-0.23 × 0.11-0.2 mm, largely in anterior half of middle third of body. Seminal vesicle elliptical, thick-walled, oblique, 0.18-0.29 × 0.07-0.12 mm, pretesticular, with its posterior end contiguous with either testis; in one paratype the sperm contents appear distinctly quadripartite. Pars prostatica a narrow tubule 0.28 mm long in the type, enclosed in sheath of longitudinal muscles and surrounded throughout its length by prostate cells; in the type it runs transversely from right to left in a gentle curve; it unites with the metraterm at varying pretesticular levels to form an unusually long hermaphroditic duct. Hermaphroditic duct slender, 1.15 mm long in the type, enclosed in sheath-like longitudinal muscles posteriorly, but projecting anteriorly into genital sinus, in which it is usually loosely winding or looped. Genital sinus tubular, 40-50 μ wide, very variable in length (0.28-0.46 mm long) and in width according to different state of contraction; when extended as in the type it may reach to near the anterior border of the acetabulum, but when contracted it becomes folded upon itself with its posterior end just behind the intestinal bifurcation. Genital pore ventral to posterior end of oral sucker.

Ovary reniform, 0.14-0.17 × 0.19-0.25 mm, equatorial or postequatorial. Vitellaria divided into six or seven, rather thick digitiform lobes, with slight indentation or branching, measuring 0.2-0.26 × 0.28-0.38 mm as a whole. Uterus convoluted in postvitellarian region, usually not extending back of cecal ends, then winding forward dorsal to ovary, testes, and seminal vesicle, finally turning back on itself behind acetabulum to be continued into short metraterm which in turn proceeds forward to unite with the pars prostatica at the posterior end of the hermaphroditic duct. Eggs small, elongate oval, thin-shelled, embryonated, 13-15 × 7-8 μ. Excretory arms uniting dorsal to pharynx; pore terminal.

DISCUSSION: This species differs from the closely related *Elytrophallus mexicanus* Manter, 1940, which was found by Manter and Pritchard (1960) in *Pseudupeneus multifasciatus* and *P. chrysonemus* of Hawaii, but which we missed., in body size (2.5-3.5 × 0.48-0.65 mm as compared with 1.1-2.3 × 0.29-0.49 mm) and in egg size. In Manter's original description of *E. mexicanus* the egg size was given as 14-17 × 6-8 μ, but in the specimens from Hawaiian goatfishes the eggs are slightly smaller, 11-14 × 6 μ. In 1940 Manter placed this genus *Elytrophallus* in the subfamily Dinurinae chiefly because of characteristics of the male terminalia, but in 1960 Manter and Pritchard believed that it might be included in the Lecithochiriinae. I agree with Manter in his former opinion. Yam., 1970.

165. *Elytrophallus bolocentri* n. sp. Yam., 1970
(Fig. 165)



HABITAT: Stomach of *Holocentrus spinifer* (type host) and *H. xantherythrus*; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63757.

DESCRIPTION (based on five whole mounts): Body rather plump, with tail protruded or retracted, 1.5-2.7 mm in total length, 0.4-0.6 mm in maximum width at vitellarian level; tail, when protruded, 0.25-0.85 mm long, as wide as body proper at base, tapered posteriorly to rounded end. Cuticle smooth. Oral sucker spherical, 70-120 × 90-120 μ, surmounted by inconspicuous preoral lobe; pharynx round, 50-65 × 45-70 μ; esophagus very short; ceca may or may not enter tail. Acetabulum 0.25-0.35 mm in diameter, in posterior half of anterior third of body. Sucker ratio 1 : 2.4-3.0.

Testes ovoid, 0.07-0.12 × 0.11-0.16 mm, obliquely tandem or juxtaposed, usually contiguous, in anterior half of middle third of body. Seminal vesicle elliptical, 0.14-0.25 × 0.07-0.11 mm, thick-walled, oblique to body axis anterodorsal to testes; pars prostatica narrow, 0.15-0.2 mm long, curved ventral to seminal vesicle in the type, but may be straightened out, surrounded by dense layer of prostatic cells, joining metraterm posterodorsal or dorsal to acetabulum to form a very long (0.35-0.7 mm lineally) hermaphroditic duct enclosed throughout in sheath of longitudinal muscles. This duct being a cuticular tubule provided outside with fine circular muscle fibers is capable of contraction and extension; it is usually more or less winding or looped at its distal portion projecting into the genital atrium. Genital atrium very long, thin-walled, tubular, variable in length and width, straight or winding, opening ventral to oral sucker. In the type it extends backward windingly to near the anterior end of the acetabulum.

Ovary transversely elongated oval, 70-130 × 120-200 μ, equatorial when the tail is retracted, pre-equatorial when the tail is protruded. Vitellaria divided into seven, rather short, digitiform tubules, measuring 0.1-0.22 × 0.2-0.32 mm as a whole. Uterus convoluted posterior to vitellaria, usually not extending back of cecal ends. In the type it runs forward on the left side of the vitellaria and, passing between the testes and the ovary dorsally, becomes distended with eggs as it winds forward along the right side of the right testis, and finally turns back on itself behind the acetabulum to be continued into a short (50-120 μ) muscular metraterm; the latter joins the distal end of the pars prostatica as mentioned above. Eggs elongate oval, thin-shelled, embryonated, 13-16 × 7-8 μ. Excretory arms uniting dorsal to pharynx or oral sucker; pore terminal.

DISCUSSION: This species differs from the most closely related *Elytrophallus fistulariae* n. sp. from *Fistularia petimba* of Hawaii only in body size. Upon comparison of the two species on the basis of abundant material, they may turn out to be identical. For the present, however, they are considered distinct.

Yam., 1970

166. *Elytrophallus mulloidichthydis* n. sp. Yam., 1970
(Fig. 166)

HABITAT: Stomach of *Mulloidichthys pfluegeri* (type host) and *Caesioperca thompsoni*; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63758.

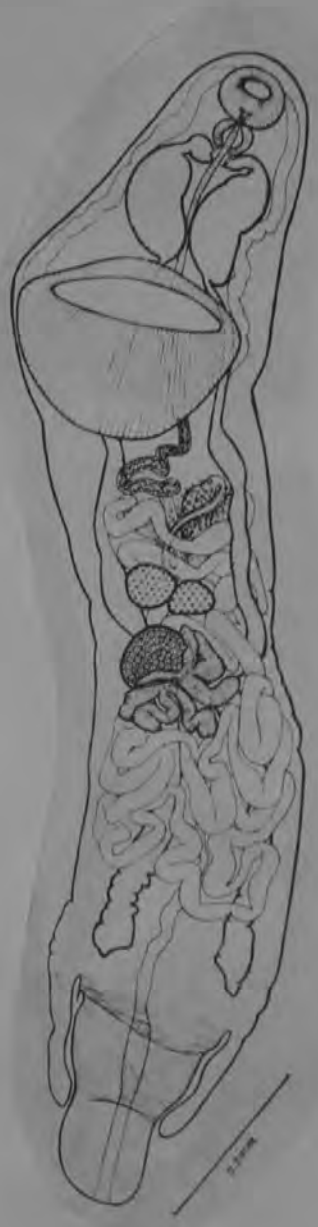
DESCRIPTION (based on two whole mounts from type host and three from other host): Body elongate, 1.9-2.1 mm in total length; forebody abruptly tapering anteriorly; hindbody cylindrical, nearly uniform in width, 0.29-0.34 mm wide except for tail, which is 0.36 mm long in the type but entirely retracted into the hindbody in one paratype. Cuticle smooth. Oral sucker subterminal, surmounted by preoral lobe. Prepharynx absent; pharynx 50-60 × 50-70 μ; esophagus very short, terminating just in front of base of tail. Acetabulum relatively large, prominent, 0.25-0.29 × 0.3-0.36 mm, in posterior part of anterior third of body. Sucker ratio 1 : 2.6-3.3.

Testes subglobular, 50-120 × 60-120 μ, ventral, diagonal, contiguous or not, just pre-equatorial. Seminal vesicle elliptical to fusiform, 0.1-0.15 × 0.04-0.06 mm, situated oblique-longitudinally anterodorsal to testes; pars prostatica very narrow, winding ventral or anterolateral to seminal vesicle. Hermaphroditic duct twisted between testes and acetabulum, enclosed in tubular sheath of fine circular and longitudinal muscle fibers, running striaght forward dorsal to acetabulum. Genital atrium very long, may reach to near level of posterior end of acetabulum. Genital pore ventral to oral sucker.

Ovary oval or somewhat reniform, 0.08-0.1 × 0.11-0.16 mm, midventral, just postequatorial, immediately behind testes. Vitellaria consisting of seven, recurved or winding, digitiform lobes which are massed together immediately behind the ovary, partly overlapping it. Receptaculum seminis small, immediately postovarian. Uterus coiled posterior to vitellaria, passing on left side of ovary, and then winding around seminal vesicle; metraterm muscular. Eggs elliptical, small, 13-15 × 7-8 μ. Excretory vesicle Y-shaped, with terminal pore; arms united dorsal to pharynx or oral sucker.

DISCUSSION: This species differs from the most closely related *Elytrophallus decapteri* n. sp. in the sucker ratio and body length, as shown in the key to the Hawaiian species of *Elytrophallus*.

Yam., 1970



ELYTROPHALLUS

ELYTROPHALLOIDES SZIDAT, 1955

Diagnosis: The new genus Elytrophalloides is very intimately related with the genus Elytrophallus Manter, 1940. As in the latter it posseses a weak body, with the caudal portion little developed. The ventral sucker, greater than the oral sucker, is in the anterior 1/3 body. The genital pore opens ventrally with respect to the oral sucker. The seminal vesicle is very large, with an elipsoidal, curved, form, with the extremities tapered, with very thick walls and not subdivided. The prostatic portion forms an ovoidal body, well differentiated from the parenchima, filled with glandular cells that surround the vas efferens. This follows the body in coils. The hermaphroditic duct very long, forming also a big coil in the inferior extremity, and containing the evaginable portion of the genital sinus in a tubular cavity. The vitellaria, the same as in Elytrophallus, divides itself into seven large lobules. There is a small seminal receptacle, and the Laurer's canal appears to be absent, the same as in Elytrophallus. The branches of the excretory system unite dorsally with respect to the pharynx. Type species: Elytrophalloides merluccii N.G. N.Sp.

Host: Merluccius hubbsi Marini. Abundant. In false host, up to now, in Eleginops maclovinus, in Aguirre Bay, Tierra de Fuego

Location: Atlantic Coast of Argentina, in front of Mar de Plata.

Reference: Szidat, L. 1955. La fauna de parasitos de Merluccius hubbsi como caracter auxiliar para la solución de problemas sistematicos y zoogeograficos del genero Merluccius L. Com. Inst. Nat. de Ciencias Naturales Bern. Rivadavia (Ciencias Zoologicas), 3(1):1-54

Elytrophalloides merluccii n.g. n. sp. (fig. 4-6)

HAROld Manter describes in 1940 a notable trematode from the stomach of 8 different fishes, seven of them captured at Socorro or Clarion Island, near the western mexican coast, in the pacific, and one obtained near the Island of James, of the Gallapagos. I refer to Elytrophallus mexicanus Manter, 1940, of the family Hemiuridae Lühe, that because of its systematic characters was very hard to include in some of the known sub-families Sterrhurinae and Dinurinae, or in some of their genera, because it presented a series of intergrading characters between many of the genera:

TRANSQUOTE N DIRECTLY FROM MANTER (1940) (DISCUSSION) pp. 423.

During my investigations related to the stomach contents of Merluccius hubbsi, I found always, and frequently in great quantity (twenty or more specimens), a trematode that is so similar in size and internal structure with Elytrophallus mexicanus that at first I thought I had the same species before me. With very detailed observation I convinced myself that I was dealing, in reality, with a different species, that for certain reasons must also be considered as belonging to a different genus, and which I shall name Elytrophaloides n.g. to denote the close resemblance with Elytrophallus.

This species also has a curious intermediate position, with characters of many genera and even of sub-families. It has a body as delicate as that of Elytrophallus, with the posterior part only very weakly developed and rarely extended, the same characteristic vitellaria with deeply sunken lobes and its esophageal diverticulum so particular to the species, but possesses a different structure in the male genital apparatus, with a giant seminal vesicle and a prostatic portion which is very short. By this character it relates itself closely with a species of Lecithocladium described by Yamaguti, in 1934 for the sea of Japan, L. magnacetabulum. The suckers, placed very close one to the other; the rings of the body, that, just the opposite to Elytrophallus, are very prominent; the form of the pharynx and also a few details of the outgoing canals of the male genital apparatus, indicate a close relationship with the Hemiurinae, especially with the genus Parahemiurus, from which it differs only because of the shape of the vitellaria and certain details of the male genital apparatus.

The same as in the case of the genus Elytrophallus, we are here in the presence of a mixed form, primitive, as is featured in many of the southamerican and South Atlantic parasites (see Szidat, 1950, Los parasitos del robalo), and in a certain way appear to be the starting point of many genera and even sub-families.

If because of Elytrophallus mexicanus the clarity of the division of the Hemiuridae in the sub-families Sterrhurinae and Dinurinae vanished, now it becomes completely unsure and doubtfull, the division into Hemuirinae and Dinurinae, and with

the study of more species, it is probable that,it may have to be eliminated completely.

Of great interest, and of great importance for our observations, is this-~~relation~~ similar relation between a parasite so frequent in Merluccius hubbsi and Elytrophallus mexicanus, that inhabits the mexican waters of the Pacific. Till now there have not been found similar forms in the North or Central Atlantic, that has in reality been well investigated; in which way, as will be seen later in treating copepod parasites, we must asume a relation with the Hemiuridae that live in the Pacific. This can only be explained by a migration of these parasites, together with their hosts, from the pacific, around Cape Horn.

Dinuridae

Elytrophalloides merlucii Szidat, 1955

Description: Body 1.75 to 1.85 mm. long when the caudal portion is semi-extended. Body 0.35 mm. in width without being compressed. The anterior part of the body shows well differentiated cuticular rings, the same as those observed in the genera Hemiurus and Dinurus. In the majority of the specimens the caudal portion is extended very little or not at all. Upon fixing the specimens in formol, the posterior part retracts totally and the contraction modifies the typical appearance of the specimen in such a way that it would appear like a species of Plerurus which evidently happened to me on finding isolated specimens of this parasite in the stomach of Elginops maclovinus from Aguirre Bay, Tierra de Fuego (Pleurus sp., see Szidat, 1950).

The oral sucker somewhat subterminal in position, measures 0.03 mm. in length by 0.10 mm. in width, the pharynx from 0.04-0.05 mm. in diameter. The ventral sucker, whose center is 0.35 mm. from the anterior extremity of the body, measures, according to the degree of contraction 0.15 to 0.17 mm. The oesophagus is very short, presents at its inferior extremity the esophageal diverticulum, in the form of a vesicle, that is also characteristic of the genus Elytrophallus. The intestinal branches, wide, penetrate with their ends somewhat into the caudal portion, when they find themselves extended.

The male genital apparatus consists of two oval testes, transverse, of smooth borders, and that in general are somewhat oblique, one behind the other, in the anterior part of the posterior half of the body. Its vas efferens leads to the seminal vesicle, of great size in this species, constituted by an elipsoidal body, in both extremities with a thick translucent wall in which the seminal fluid is stored. This vesicle is the greatest of all that can be observed in species of the Hemiuridae, and differentiates this species from all others at first glance. In the live animal it appears as a strange body, or a hyperparasite that may have attacked the trematode. Almost immediately after leaving the seminal vesicle, the vas efferens enters into a spherical to elipsoidal body, well differentiated in the parenchyma, in the form of a tight loop. We are dealing with the prostatic portion, with a very characteristic appearance for this species, whose glandular elements have united themselves in a spherical body.

Upon leaving the prostatic body, the duct joins with the aperture of the uterus, forming from there on a hermaphroditic duct, very long, with a loop that extends to the middle of the seminal vesicle, and enclosed inside of a tubular conduit (tube), that can evaginate itself in form of a copulatory organ, but that generally is found retracted. In this state one can recognize it as a thickening or coil inside of the genital tube, approximately at the level of the ventral sucker.

The female genital apparatus consists of a transverse ovary, of oval form, with smooth border, placed in the median body line behind the testes, and 1½ times larger than these (testes). Immediately behind it the vitellaria are found, large, with three oval lobules to the right, three to the left and one central lobe towards the rear. The seminal receptacle is notably small and can only be observed in the live animal. Neither could the presence of a Laurer's canal be observed.

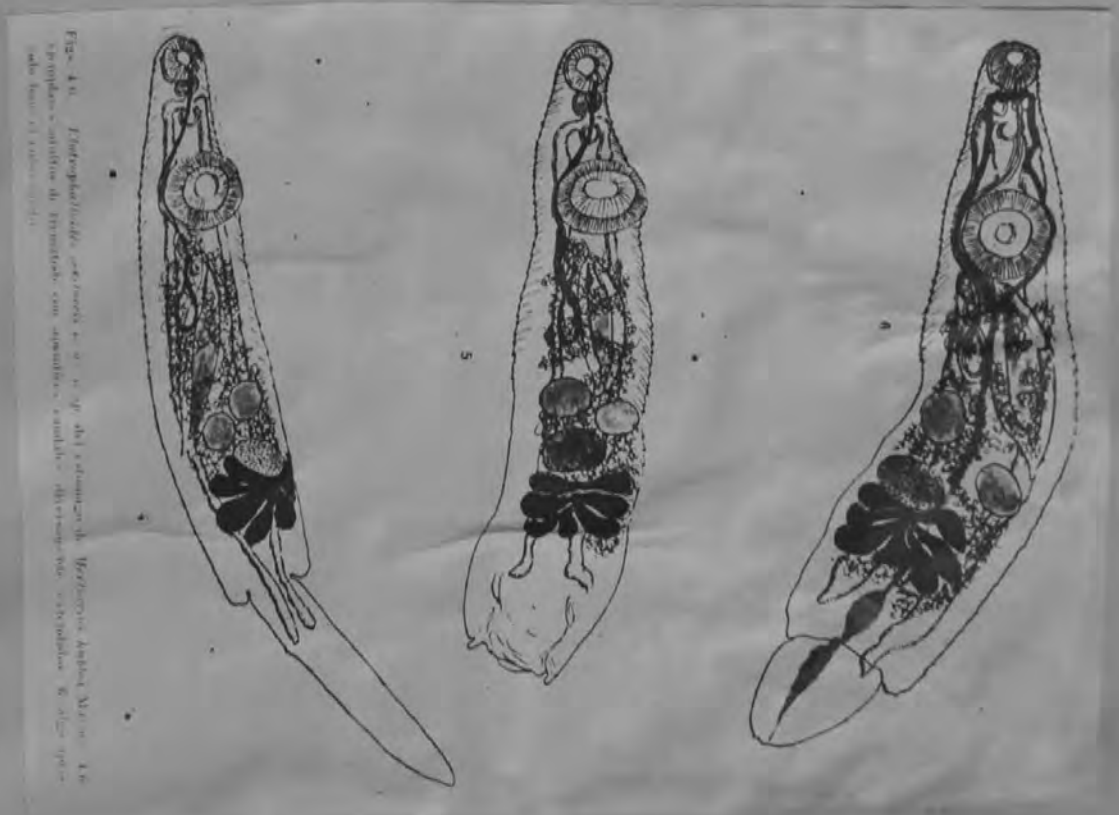
The uterus extends first towards the rear, but without reaching the posterior extremity of the body and without penetrating the caudal portion, in the form of open coils that do not cover the genital glands.

Afterwards it extends between the testes up to the prostatic section; just beneath the ventral sucker, opening there in the already mentioned hermaphroditic duct.

The eggs are very numerous, of a pale golden, ~~pale~~ yellow color without filaments, and measure (average) 0.020 mm. in length by 0.011 mm. in width.

The excretory system is formed by a urinary vesicle somewhat wide, placed in the posterior portion of the body. From it extends a branch _____, long, until immediately beneath the ventral sucker, where it bifurcates, to return and reunite itself beneath the pharynx.

Elytrophalloides merluccii is a normal parasite of the stomach of Merluccius hubbsi Marini, where it frequently appears in twenties. In one occassion one individual was found in the stomach of Eleginops maclovinus, (Robalo) from Tierra de Fuego, but probably it was in a false host.



Family HEMIURIDAE

Elytrophalloides oatesi (Leiper and Atkinson) Szidat and Graefe

(Fig. 17)

Hemiurus oatesi Leiper and Atkinson, 1914, 224.

Parahemiurus oatesi (Leiper and Atkinson) Manter, 1954, 477; Skrjabin and Guschanskaya, 1954, 311.

Plerurus sp. Szidat, 1950, 248.

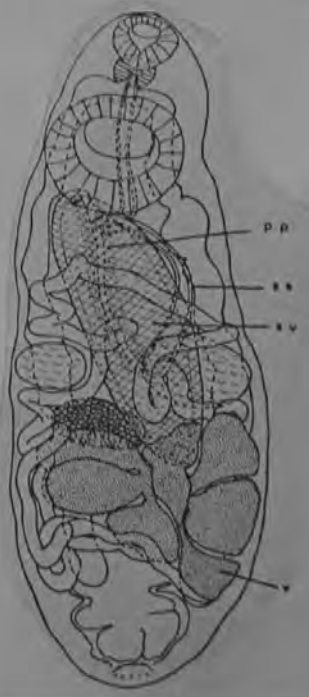
Elytrophalloides merluccii Szidat, 1955, 24.

Elytrophalloides oatesi (Leiper and Atkinson) Szidat and Graefe, 1967, 12.

Hosts and localities: *Chionodraco kathleenae* — A.A.E., 65°6'S, 96°14'E; *Cryodraco antarcticus* — Stn. 107; A.A.E., 65°42'S, 92°10'E; *Cygnodraco mawsoni* — Stn. 107; *Notothenia mizops* — Kerguelen; *Pagetopsis macropterus* — A.A.E., 66°32'S, 141°39'E; *Trematomus bernacchii* — Stn. 105; *Trematomus centronotus* — Stn. 105; *Trematomus lepidorhinus* — Stn. 107; *Trematomus newnesi* — Stn. 106; *Trematomus scotti* — Stn. 103; *Upeneichthys porosus* — Stn. 76.

In all of the specimens examined the body is shrunken to a more or less degree and the cesoma withdrawn. These specimens are small and elongate oval, measuring 0.78 mm to 1.8 mm in length and 0.24 mm to 0.5 mm in maximum width, which occurs in various regions behind the ventral sucker. Cuticular plications on the surface of the body are shallow and well separated from each other, but in some specimens, however, they are not apparent. The oral sucker measures 0.9–0.21 mm in diameter, while the ventral sucker, which is situated close behind the oral sucker, measures 0.15–0.33 mm in diameter; the ratio of the suckers being 1:1.3 to 1.5. Sometimes a small pre-oral lobe is noticeable, and this is apparently due to a thickening of the dorsal wall of the oral sucker. As the specimens are somewhat shrunken, the pharynx shows a variety of shapes, principally longer than wide (0.1 × 0.087 mm), globular (0.05–0.09 mm in diameter) or transversely oval (0.06 × 0.087 mm). An oesophagus has not been made out, but the intestinal cacca are wide and undulate into the posterior region of the body. They are lined with a distinct epithelium.

The testes are situated behind the ventral sucker. They are variously arranged, being symmetrically side by side, or somewhat diagonally one behind the other, or even one obliquely superimposed on the other in a dorso-ventral plane. The usual arrangement, however, seems to be more or less symmetrical. They are irregular in outline and have a diameter varying from 0.062 mm to 0.22 mm. The seminal vesicle has a very thick wall of diagonally-disposed muscle-fibres. It is fusiform and of variable size, 0.3–0.6 mm long and 0.15–0.21 mm wide. It lies obliquely between the ventral sucker and the testes or vitelline complex. The pars prostatica is sinuous and invested with well-developed gland-cells. From the anterior end of the seminal vesicle, the pars prostatica curves posteriorly and around the hinder region of the vesicle unites with the uterus to form a hermaphroditic duct. The latter is enclosed in a long sinus-sac and opens into a narrow genital atrium through a papilla of varying length. The genital pore is situated ventrally in the median line, close behind the opening of the oral sucker.



0.25 mm

-over-

The ovary lies in the median line or to one side of it, immediately behind the testes, which it resembles closely in shape and size. A receptaculum seminis has not been observed, but in a sectioned specimen a considerable number of spermatozoa have accumulated in the proximal region of the uterus. No Laurer's canal has been made out. The oötype is relatively large and might readily be mistaken in whole mounts for a receptaculum seminis. In whole mounts of contracted specimens the vitelline complex is difficult to interpret with accuracy, for sometimes it appears as a single deeply-lobed organ, and sometimes as two closely-approximate lobed structures, lying close behind the ovary. From a study of serial sections, however, it appears that the complex is actually a stellate structure consisting of seven, occasionally eight, lobes usually disposed four on one side and the remainder on the other. The lobes are pyriform or claviform. The uterine coils are widely distributed in the hind-body, extending posteriorly as far as, but not into, the ecsoma. The eggs measure 20–25μm × 10–12 μm.

The above material agrees very well with Byrd's (1963) re-description of this species from *Trematomus hernacchii*, *T. kansoni* and *T. centronotus* in McMurdo Sound, Antarctica. As indicated in Leiper and Atkinson's description of *Hemiurus oatesi*, the original specimens are rather larger than any of those described subsequently. There is, however, one very important discrepancy in their description, as suspected by Byrd, namely, the size of the eggs. The co-authors gave the egg-size as 0.05 mm × 0.03 mm, but in a syntype specimen examined by the present writers the eggs measure, in an uncollapsed condition, 0.02–0.025 mm × 0.01–0.012 mm, otherwise the specimen agrees very well with the original description. Szidat and Graefe (1967) consider *Hemiurus oatesi* as a member of the genus *Elytrophalloides* Szidat, 1955, and, in fact, regard it as synonymous with *E. merluccii* Szidat, 1955, although they do regard the form in *Merluccius* to be subspecifically distinct from that in *Trematomus*. There seems to be very little doubt that *Hemiurus oatesi* and *Elytrophalloides merluccii* are identical, but the latter is said to possess a small receptaculum seminis, apparently seen only in living worms, whilst in the former this structure has not been observed. Nevertheless, as stated above, in serial sections of one of the present specimens the proximal region of the uterus contains a mass of spermatozoa, suggesting the presence of a receptaculum seminis uterinum.

There seem to be differences of opinion as to the systematic position of this species. Originally, it was placed in the genus *Hemiurus*, but the form does not possess a seminal vesicle deeply constricted into two portions, and presumably for this reason, and because of the thick walls of the seminal vesicle, Manter (1954), independently of Skrjabin and Guschanskaya (1954), transferred it to the genus *Parahemiurus*. The combination *Parahemiurus oatesi* was accepted by Byrd (1963), but on the basis of the vitelline structure this species does not appear to belong to either of these two genera. On the other hand, Szidat and Graefe (1967) transferred this species to the genus *Elytrophalloides*, apparently because of its large thick-walled seminal vesicle and short prostatic duct, features which, together with cuticular plications on the body, enable this genus to be differentiated from *Elytrophallus*.

According to the most recent classification of the family Hemiuridae (Yamaguti, 1971), *Elytrophalloides* belongs to the subfamily Dinurinae, inasmuch as it possesses an ecsoma and a stellate vitelline mass usually consisting of seven lobes. The constitutions of most of the genera placed in this subfamily by Yamaguti seem to be somewhat arbitrary. For instance, *Parahemiurus australis* Woolcock, 1935, and *P. lovettiae* Crowcroft, 1947, show a considerable resemblance to the type-species of *Elytrophalloides*, and their transfer to *Elytrophallus* by Yamaguti is therefore questionable, if the two genera are regarded as distinct. Moreover, for some inexplicable reason Yamaguti has placed *Parahemiurus oatesi* and *Elytrophalloides merluccii* in different subfamilies. It is evident that until a revision of the group based on examination of actual specimens, particularly of the type-species, and not merely on a review of the literature, is undertaken, the generic constitution of the subfamily Dinurinae in the sense of Yamaguti (1971) will remain unsatisfactory.

Elytrophalloides oatesi appears to be a common parasite of various Antarctic fishes, but its distribution is now known to range into sub-Antarctic regions, as well as into Australian and Argentine waters.

Prudhoe and Bray, 1973

ELYTROPHALLOIDES

Dinurinae 1: 2.5

ERILEPTURUS Woolcock 1935

Syn: Uterovesiculares

Small cylindrical Dinurinae, with short ecsoma. Cuticle of soma faintly ringed. Oral sucker simple, subterminal. Ventral sucker large, globular, at about the middle of the soma length. Ratio of diameters of suckers 2:5. Prepharynx lacking, esophagus short, intestinal diverticula entering appendix. Arms of excretory vesicle meeting behind anterior sucker. Genital pore common, median. Genital atrium large, ovoid; sinus sac muscular, bulb-shaped. Testes post-acetabylar, oval, entire, intercecal, oblique. Vesicula seminalis tripartite,* in main post-acetabular. Pars prostatica moderately short, the greater part of the male conducting tube free from prostatic cells. Ductus hermaphroditicus (genital sinus) longer than pars prostatica, functioning as cirrus. Ovary median, oval, and post-testicular. Vitellaria post-ovarian, narrow, irregular, flattened, tubular processes. Receptaculum seminis present. Uterus voluminous, posterior extension not entering appendix. Union of male and female conducting tubes directly anterior to the pars prostatica. Eggs small, oval, numerous. Habitat: stomach of fishes. Type species: Erilepturus tiegsi

Most like Ectenurus. Differs from both species (E.lepidus and E.angusticauda) in structure of terminal genital organs, position of acetabulum, and in that the arms of the excretory vesicle meet at the anterior end.

See Parasitology vol.27, no.3. 1935

* indistinctly so in most but not all specimens

Cuticle "not plicated as in Parahemiurus"

sem. ves. more or less sac-like

ex. Crura unite

Species: 1. E. tiegsi
2. E. hamati (Yam., 1934)
3. E. paralichthydis (Yam., 1934)
4. E. lemeriensis (Tub. & Maz., 1935

Uterovesiculurus Skrjabin et Guschanskaja, 1954

Generic diagnosis. — Hemiuridae, Dinurinae: Body elongate, somewhat fusiform, with tail partly or entirely invaginated. Oral sucker subterminal, with preoral lobe. Esophagus short, ceca extending into tail. Acetabulum large, in middle third of body. Testes diagonal or juxtaposed, postacetabular. Vesicula seminalis saccular, may be constricted into two portions, posterodorsal to acetabulum. The duct connecting the seminal vesicle with the hermaphroditic duct is long, narrow, and surrounded by prostate cells at its distal portion alone. Ductus hermaphroditicus enclosed in hermaphroditic pouch, opening into tubular genital atrium, whose wall may be partly muscular. Genital pore ventral to oral sucker. Ovary slightly submedian, at or near junction of middle with posterior third of body. Vitellaria consisting of seven winding tubular lobes. Uterus not extending into tail, its terminal portion forming more or less conspicuous dilatation just before opening into hermaphroditic duct. Excretory arms uniting dorsal to pharynx. Stomach parasites of marine fishes.

Genotype: *U. hamati* (Yamaguti, 1934) Skrj. et Gusch., 1954, (Pl. 37, Fig. 473 a—b), syn. *Ectenurus h.* Y.; *Erilepturus h.* (Y.) Manter, 1947; in *Seriola quinqueradiata, S. aureovittata, Epinephelus fasciatus, E. septenfasciatus, Sciaena schlegeli;* Inland Sea, Toyama Bay, Mutu Bay, Pacific coast of Japan.

Other species:

E. paralichthydis (Yamaguti, 1934) Skrj. et Gusch., 1954, syn. *Ectenurus p.* Y., in *Paralichthys olivaceus;* Hamana-ko, Japan.

E. platycephali (Yamaguti, 1934) Skrj. et Gusch., 1954, syn. *Ectenurus p.* Y., in *Platycephalus indicus;* Hamana-ko, Japan.

KEY TO SPECIES OF ERILEPTURUS Woolcock,1935

(from Reid, Coil, & Kuntz,1966) J.P.

1. Seminal vesicle saccular, dorsal or postero-dorsal tp acetabulum; sinus sac muscular.....2

   Seminal vesicle bipartite, intertesticular, sinus sac muscular.....E.paralichthydis (Yam.,1934)

   Seminal vesicle tripartite; sinus sac tubular, thin-walled.....E.africanus Fischthal & Kuntz,1963

2. Uterine slings extending into forebody; genital atrium long, tubular.....3

   Uterine coils confined to hindbody, genital atrium short.....E.formosae Reid,Coil & Kuntz

3. Sinus sac lacking muscular sphincters.....4

   Sinus sac possessing two muscular sphincters..... .....E.tiegsi Woolcock,1935

4. Efferent duct sinuous, sinus sac large, strongly muscular.....5

   Effenernt duct straight; sinus sac small, with less developed musculature...E.lemeriensis (Tubangui & Masilungan,1934) Manter,1947

5. Testes diagonnl,contiguous, wedge-shaped; dorsal glandular pit absent.....E.hamati (Yam.,1934)Manter,1947

   Testes symmetrical, well separated by uterus, oval; dorsal glandular pit present..... ...E.platycephali (Yam.,1934) Manter & Pritchard, 1960

Key to species of *Erilepturus* from Hawaiian fishes

1. Acetabulum nearly as large as oral sucker; testes close together; genital atrium tubular ..... *E. aequalis*

   Acetabulum definitely larger than oral sucker; testes wide apart; genital atrium funnel-shaped 2

2. Prostatic cells strongly developed and delimited from surrounding parenchyma by membranous capsule; testes diagonal ..... *E. trachinocephali*

   Prostatic cells less strongly developed, not delimited from surrounding parenchyma by membranous capsule; testes subsymmetrical ..... *E. synodi*

Yam., 1970.

Erilepturus tiegsi ~~n. sp. n. g.~~ (Pl. IX, fig. 7) WOOLCOCK, 1935

Marine form, found in the stomach and intestine of *Arripis trutta* (Salmon Trout).

Locality: Port Philip Bay, Victoria.

Incidence: Of the six Salmon Trout investigated three had one or two specimens each.

Total length of formalinised specimens 4–6·5 mm.; maximum breadth (at level of ovary), 1·5–2 mm. Appendix (ecsoma) very variable, from one-fifth to one-eighth soma length. Body narrow, cylindrical. Cuticle not plicated as in *Parahemiurus*, but very finely ringed. This character, as also noted by Linton (1907) for a related genus, tends to disappear when the specimens have been under slight pressure for some time. Not to be confused with this faint ringing of the cuticle is the ringed appearance of these trematodes due to surface corrugations which involve both cuticle and muscles, and increase with the degree of contraction. The oral sucker is small, globular, and subterminal, the portion anterior to it appearing as a lip like fold. A few scattered papillae, presumably sensory in function, are to be seen in this region, but are not visible in stained and mounted specimens. The ventral sucker, situated at about the middle of the body length, is large and globular, with a diameter approximately two and a half times that of the oral sucker. A prepharynx is lacking, and the small spherical pharynx 0·16 mm. in diameter, passes to a narrow, short oesophagus. The intestinal diverticula extend backwards into the appendix as in the previous form, but do not possess any specially demarcated portion, nor are their walls crenated.

The excretory pore is terminal, passing to the dilated terminal portion of the narrow excretory vesicle which bifurcates slightly posterior to the acetabulum into two undulating arms of yet narrower calibre. These arms pass on either side of the acetabulum proceeding anteriorly in the lateral regions of the body, where at the level of the pharynx they curve inwards to meet behind the anterior sucker.

The common genital pore is median, situated immediately behind the pharynx, and passes to a large, ovoid, muscular atrium, from the basal end of which the ductus hermaphroditicus (genital sinus) leads off. Towards the genital pore, longitudinal and circular muscles are clearly to be observed in the wall of the atrium.

The testes, 0·35–0·4 mm. in diameter, are post-acetabular, two in number, oval and slightly elongated, and lie obliquely within the intercaecal space. The vasa deferentia are short, and unite just posterior to their entrance into the simple elongate sac-like vesicula seminalis. Thin walled, and appearing indistinctly tripartite in most though not all specimens, it is in the main post-acetabular, while the duct leading out from its anterior end is for the greater part of its length free from prostatic cells, the pars prostatica being confined to a moderately short section lying median, some distance anterior to the ventral sucker, and directly posterior to the ductus hermaphroditicus. The first part of this latter is slightly swollen, and surrounded by a strongly muscular sinus sac, the basal end of which is also swollen and bulb-like, the distal tapering anteriorly towards the atrium. On the wall of this latter section are to be observed, a short distance apart, two annular bands of muscle fibres, which function as sphincters during the process of egg-laying. The anterior termination of the majority of the muscle fibres of the sinus sac is on the wall of the ductus hermaphroditicus. This latter here also functions as a cirrus, but the wall of the atrium in this case apparently takes no part in its extrusion.

The ovary is median, oval, post-testicular, and slightly larger than the testes. The vitellaria lie directly behind the ovary, and consist of about six long irregular finger-like processes. A receptaculum seminis is present, but as in *Parahemiurus australis* its relation to other organs is not clear in either living or stained specimens. The uterus here is also voluminous and pursues a winding course similar to that of the previous genus, but does not enter the appendix. The union of male and female conducting tubes to give the ductus hermaphroditicus takes place directly anterior to the pars prostatica.

The eggs are numerous, small and oval, measuring $10 \times 22 \mu$. During the process of egg-laying the pre-acetabular portion of the body of the trematode undergoes alternating contractile and extensile movements. During extension a number of eggs, about 12–14, are drawn into the first portion of the ductus hermaphroditicus. Here they remain till the worm contracts, when a propulsive movement of this region sends them beyond the first muscle band, which now functioning as a sphincter immediately contracts and prevents their return. With a second extension a further batch of eggs is sucked in from the uterus to the ductus, while a further contraction followed by propulsive movements of the ductus sends the first eggs beyond the second band into the atrium, while the opening of the first sphincter allows their place to be taken by the second batch. Both muscle bands now contract, preventing any backward passage of the eggs. During the time these movements were observed the atrium remained completely filled with eggs, from which it may be presumed that the number entering the atrium and leaving it were about equal. An accurate count of the trail of eggs left behind on the slide at each contraction was not possible.

Considerable difficulty has been experienced in assigning this hemiurid to its systematic position, in part owing to the indefinite character of its cuticle, in part owing to its combining the characters of several genera. Concerning the ringing of the cuticle, regarded as a fundamental subfamily character among the Hemiuridae, the point for consideration has centred on the exact significance of the term "ringing". In the diagnosis of the subfamily Hemiurinae as cited by Looss (1907 *b*) there is no doubt as to the nature of the transverse plications, for he says: "Haut im Vorderkörper mit scharf nach aussen vorspringenden Querleisten, die ihr im Profil das Aussehen einer Säge mit nach hinten gerichteten Zähnen geben." In the diagnosis of the subfamily Dinurinae however, only the term "quergeringelt" is given to describe the nature of the cuticle. The question arises as to whether "quergeringelt" (the meaning of which has already been extended to meet cases where the body rings tend to split up into scales) was originally meant only for the saw-like edge of the Hemiurinae, or meant to include a faint ringing such as described in the present form. Nicoll (1915) has evidently considered this latter to be the case, for in his description of *Ectenurus angusticauda* he states that "the cuticle is not markedly annulated, only traces of transverse wrinkles being present." That a feature, which, in the many genera and species of the Hemiuridae has proved so variable and inconstant—a feature too, which, as recorded earlier, has been shown to be affected by the slight pressure used during fixation—should be employed as a fundamental subfamily character does not appear at all satisfactory.

While the form here described appears to have features in common with both the Sterrhurinae and Lecithasterinae, it is felt that the cuticle cannot definitely be described as smooth, and on this account these subfamilies have been excluded. Possibly this hemiurid has more features in common with the Dinurinae than the Hemiurinae, but even then the former subfamily, as diagnosed by Looss, would have to be modified to receive it. The ecsoma here, though quite definite, is certainly not well developed. Looss, however, in the diagnosis of one of the genera of the Dinurinae, *Ectenurus*, modifies his statement "mit wohl-entwickeltem Abdomen," saying "Das Abdomen ist an sich wohlentwickelt, aber klein im Vergleich zu dem der *Dinuren*." He does not, however, indicate this in his diagnosis of the subfamily. Of the known genera of the Dinurinae, the affinities of the form just described appear to lie more closely with this genus *Ectenurus*, fully agreeing with the somewhat brief diagnosis. There are two species of the genus to be considered, *E. lepidus* (Looss) and *E. angusticauda* (Nicoll). In the structure of the terminal genital organs and the position of the acetabulum, the new form differs from both species. A further point of difference is to be found in the excretory system, the arms of the excretory vesicle not meeting at the anterior end in *E. lepidus*, while they do so here. Nicoll does not mention the excretory system in his description of *E. angusticauda*. Any of these differences occurring separately would not justify the erection of a separate genus, but since all the peculiarities occur in the one species it is considered that the bounds of a logical generic limitation have been passed, and that the creation of a separate genus is justifiable.

short, the greater part of the male conducting tube free from prostatic cells. Ductus hermaphroditicus (genital sinus) longer than pars prostatica, functioning as cirrus. Ovary median, oval, and post-testicular. Vitellaria post-ovarian, narrow, irregular, flattened tubular processes. Receptaculum seminis present. Uterus voluminous, posterior extension not entering appendix. Union of male and female conducting tubes directly anterior to the pars prostatica. Eggs small, oval, numerous. Habitat: stomach of fishes. Type species: *Eriepturus lagoi*. The species is named in honour of Dr O. W. Tiegs, Associate Professor of Zoology, University of Melbourne.

The name *Eriepturus* is suggested and from the above description is diagnosed as follows.

Small cylindrical Dinurinae, with short ecsoma. Cuticle of soma faintly ringed. Oral sucker simple, subterminal. Ventral sucker large, globular, at about the middle of the soma length. Ratio of diameters of suckers 2 : 5. Pharynx lacking, oesophagus short, intestinal diverticula entering appendix. Arms of excretory vesicle meeting behind anterior sucker. Genital pore common, median. Genital atrium large, ovoid; sinus sac muscular, bulb-shaped. Testes post-acetabular, oval, entire, intercecal, oblique. Vesicula seminalis tripartite, in main post-acetabular. Pars prostatica moderately

From: Manter 1969:

Erilepturus tiegsi Woolcock, 1935 (Figs. 3–4)

HOSTS: *Epinephelus* sp.; Serranidae. Serranidae; a mottled "grouper." Serranidae: "loche bleue."

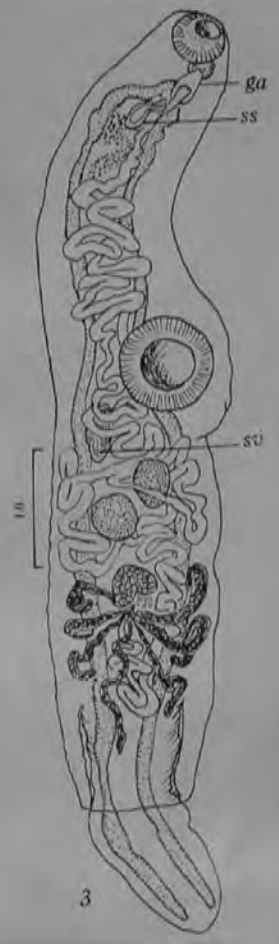
LOCATION: Stomach.

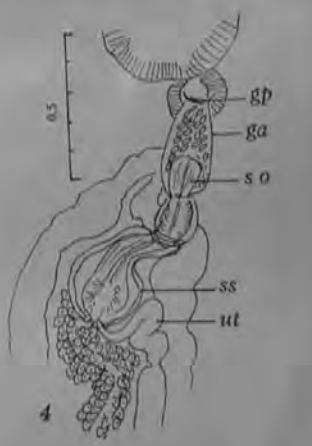
NUMBER: One or two specimens in each of five hosts.

DISCUSSION: This species is previously known from Port Philip Bay, Victoria, Australia. It has not been collected from warmer waters of Australia.

The sucker ratio (given as approximately 1:2.5 by Woolcock) is 1:1.95–2 in my specimens. The base of the sinus sac is thick-walled and contains radial muscles; the sinus organ is thick-walled with circular muscles; the atrium is separated from the sinus sac.

The *sinus organ* (Fig. 4), a structure named by Manter (1969), was well described but not clearly figured by Woolcock (1935). A sinus organ is a muscular, cylindrical organ lying more or less free in the sinus sac and penetrated by a lumen, the hermaphroditic duct. It is long, coiled, and conspicuous in the genus *Elytrophallus* Manter, 1940, where it lies in a thin-walled portion of the sinus sac (Fig. 5) and is protrusible into the genital atrium. The duct of the sinus organ may contain sperm cells, eggs, or both. Manter (1969) showed that a sinus organ occurs in several species of *Dinurus* Looss, 1907 (Fig. 6). It also occurs to varying degree in *Elytrophalloides* Szidat, 1955, and *Ectenurus* Looss, 1907 (Fig. 7). Thus, the sinus organ of Manter (1969) equals the "sinus tube" of Manter (1940), "cirrus" of Looss (1907), and "terminal muscular bulb of the hermaphroditic duct" of Fischthal & Kuntz (1963). The genus *Lampritrema* Yamaguti, 1941, has a similar long, muscular tube lying in a tubular genital atrium but in this species it is a male tube only, the uterus opening separately into the base of the tubular genital atrium (see Margolis, 1962). The tube here is technically a cirrus but it seems evident that it has evolved from a sinus organ and is not homologous with the cirrus of other families of trematodes.





160. *Erilepturus aequalis* ~~n. sp.~~ Yam., 1970
(Fig. 160)

HABITAT: Stomach of *Taractes (Taractes) rubescens*; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63752.

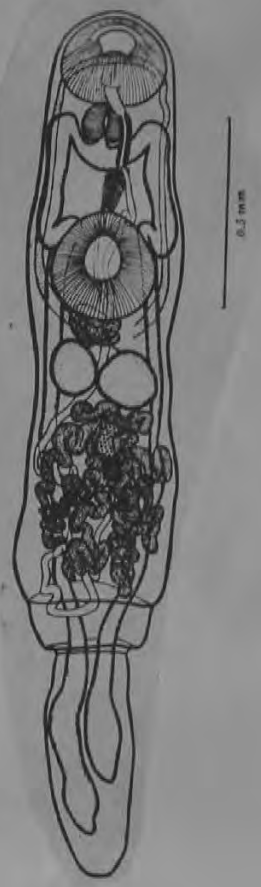
DESCRIPTION (based on a single mount): Body subcylindrical, 2.25 mm in total length, 0.4 mm wide at level of acetabulum; tail plump, 0.6 X 0.23 mm. Cuticle comparatively thin, smooth. Oral sucker round, subterminal, 0.25 X 0.28 mm, with quadrangular aperture, surmounted by inconspicuous preoral lobe. Pharynx globular, 0.1 X 0.11 mm; esophagus practically absent; ceca terminating near posterior end of tail. Acetabulum 0.28 mm in diameter, situated at posterior end of anterior third of body.

Testes round, 0.14-0.15 X 0.12-0.15 mm, juxtaposed in pre-equatorial zone. Seminal vesicle forming a convolution between right testis and acetabulum, partly overlapping latter; the duct connecting the seminal vesicle with the pars prostatica is narrow, running forward dorsal to acetabulum; pars prostatica tubular, surrounded by dense layer of prostate cells, immediately pre-acetabular, united with metraterm about halfway between acetabulum and pharynx; hermaphroditic duct narrow, running straight forward by left side of pharynx, enclosed in thin-walled sheath-like hermaphroditic pouch, opening into genital atrium ventral to pharynx. Genital atrium tubular, about 50 μ long, curved, opening outside ventral to oral sucker.

Ovary heart-shaped, 0.08 X 0.12 mm, median, equatorial, separated from testes by anteriormost vitelline tubule, with compact shell gland mass immediately behind and between right and left vitelline tubules. Vitellaria consisting of seven, strongly winding, digitiform tubules, of which the posterior extend as far back as the first annular body constriction lying at junction of middle with posterior third of body. The proximal portion of the uterus also descends to this level; the ascending distal portion passes on the right side of vitellaria and between two testes dorsally and then dorsal to seminal vesicle, finally dorsal to acetabulum. Metraterm to left of pars prostatica. Eggs elongate oval, 21-23 X 9-12 μ in life. Excretory arms uniting dorsal to oral sucker.

DISCUSSION. This species is characterized by the equal size of the two suckers; hence the specific name. In this genus the acetabulum is usually larger than the oral sucker.

Yam., 1970.



Hemiuridae

Erilepturus formosae Reid, Coil & Kuntz, 1966

Subfamily Dinurinae Looss, 1907
***Erilepturus formosae* sp. n.**
(Fig. 1)

Diagnosis: Based on six mature specimens with the characters of the genus. Body appendiculate, smooth, slightly attenuated anteriorly, 1.21 to 1.52 mm long (excluding ecsoma) by 357 to 496 wide at testicular level. Ecsoma retracted in four of six specimens, partially evaginated 226 to 246 in two. Oral sucker subterminal, 128 to 256 by 108 to 168. Preoral lobe present, prepharynx absent. Pharynx ovoid 84 to 90 by 80, esophagus short; ceca simple extending into ecsoma. Acetabulum 264 to 300 by 280 to 310, larger than oral sucker, situated in middle third of body. Testes ovoid, diagonal, contiguous, situated immediately posterior to acetabulum anterior testis 78 to 154 by 60 to 100 and slightly overlapping acetabulum, posterior testis 66 to 140 by 40 to 108. Seminal vesicle elongate-oval, undivided, thin-walled, dorsal and posteriodorsal to acetabulum, 80 to 140 long by 80 to 95 wide. Pars prostatica sinuous, anterior third surrounded by well-developed prostatic cells, sinus sac pyriform, attenuated anteriorly, enclosing entire hermaphroditic duct, surrounded by thick muscular wall, anterior third of sinus sac delimited by a single muscular sphincter. Genital atrium short, distinct genital pore median, ventral to oral sucker. Ovary median, transversely ovoid, posttesticular, separated from posterior testis by uterine sling, 100 to 136 long by 50 to 90 wide. Uterus extending to postovarian level, but not entering ecsoma, slings limited to postacetabular region, uterine swelling present immediately before penetration of sinus sac by metraterm, in varying degrees of distension. Metraterm joins hermaphroditic duct immediately upon entering sinus sac. Vitellaria postovarian, consisting of six to eight long digitiform lobes, joined centrally. Eggs numerous, small, 18 to 20 by 10 to 12; excretory crura united dorsal to pharynx.

Host: *Alectis indica* (Ruppell), (plumed trevally).

Site of infection: Intestine.

Locality: Formosan waters.

Specimens deposited: USNM Helm. Coll. Nos. 61055 (holotype) and 61056 (section type).

Discussion

Erilepturus formosae is the smallest of the known species of the genus. It closely resembles the type, *E. tiegsi* W... 1935, but the latter possesses two ... sphincters around the sinus sac instead ... one. In addition, *E. tiegsi* is much lar... to 6.5 mm compared to 1.2 to 1.5 m... uterine slings extend anterior to the ...ulum and it lacks a ... swelling ... uterus immediately posterior to the si... as does *E. africanus* Fischthal and Kunt...

Woolcock (1935) erected the genus ...turus for smooth-bodied dinurids w... affinities to species of *Ectenurus* Loos... Manter (1947) subsequently placed ... genus *Erilepturus*: *E. hamati* Yamaguti ..., *E. platycephali* (Yamaguti, 1934), *E. pa...thydis* (Yamaguti, 1934), and *E. lem...* (Tubangui and Masiluñgan, 1935), which were originally allocated to *Ecte...*

...maguti (1954), however, synonymized *Eri...turus* with *Ectenurus*, to include the five ...viously mentioned species, *E. virgulus* Lin..., 1910 and *E. lepidus* Looss, 1907. At the ...e time, Skrjabin and Guschanskaja (1954) ...ated *Uterovesiculurus* for Yamaguti's three ...enurids based on the presence of the swell... at the distal end of the uterus. They also ...ognized the validity of *Erilepturus* and ...*tenurus*. Yamaguti (1958) recognized *Utero...siculurus* but continued to synonymize ...*ilepturus* with *Ectenurus*. Manter and Prit...ard (1960b) synonymized *Uterovesiculurus* ...th *Ectenurus* after demonstrating that the ...erine swellings of the former genus are of ...riable nature. Velasquez (1962) recognized ...oolcock's genus and redescribed *E. lemerien...*. Fischthal and Kuntz (1963) reviewed the ...nus and described *Erilepturus africanus* from ...gypt. In a later work (1965), they reported *...platycephali* from North Borneo, noting the ...esence of a dorsal glandular pit in that ...ecies.

There is considerable doubt in our minds ...at *E. africanus* is properly allocated to this ...nus. The narrow, thin-walled sinus sac, the ...raight pars prostatica, and the tripartite semi...al vesicle of *E. africanus* are characters which ...ffer markedly from those found in other ...embers of the genus. One can separate it ...om both *Ectenurus* and *Dinurus* on the basis ...f the smooth cuticle. Fischthal and Kuntz (1963) do not refer to the nature of the excre...ory crura (united or not united), and in an ...xamination (W.A.R.) of the paratype the ...rura could not be seen. Manter (1947) used ...his character as one criterion to separate ...*rilepturus* (united) from *Ectenurus* and *Di...urus* (not united). Since only two specimens, the type and paratype, are available the allo...ation of this species to *Erilepturus* is at best ...rovisional. The acquisition of new material ...ay well warrant the establishment of a new ...enus to accommodate *E. africanus*.

Erilepturus formosae sp. n. ... lateral aspect.

Jour. Parasit., 52(1): 39-45

Erilepturus ~~Setenurus~~ hamati (Yamaguti, 1934) Manter, 1947

Generic characters. Body plump, 2. to 4. by 0.6 to 1.5 Tail invaginated at or behind vitelline gland. Oral sucker 0.2 to 0.38 . Pharynx 0.11 to 0.21 by 0.11 to 0.2. Acetabulum 0.45 to 0.7 by 0.46 to 0.74 , in anterior part of middle third of body. Testes closely oblique, at about middle ~~third~~ of body, 0.15 to 0.18 by 0.24 to 0.25. Seminal vesicle large, posterodorsal to acetabulum. Ovary transversely elongate, reniform, 0.15 to 0.24 , at about junction of middle with posterior third of body. Eggs 18 to 19 by 11 to 12 μ.

Host: Seriola quinqueradiata, S. aureovittata and Epinephelus fasciatus.
Locality: Japan.

Differs from E. lepidus in size of body as well as of suckers. The saccular swelling of the terminal part of the uterus is very characteristic of this species. It occurs less conspicuously in E. paralichthydis and E. platycephali

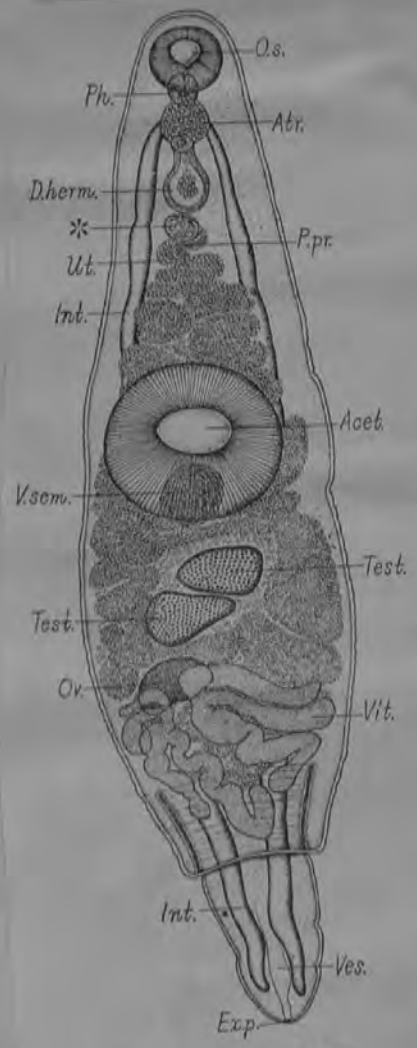


Fig. 109. *Ectenurus hamati*; ventral view.
Type (2.7?+0.86) × 0.86 mm.
* Saccular swelling of uterus.

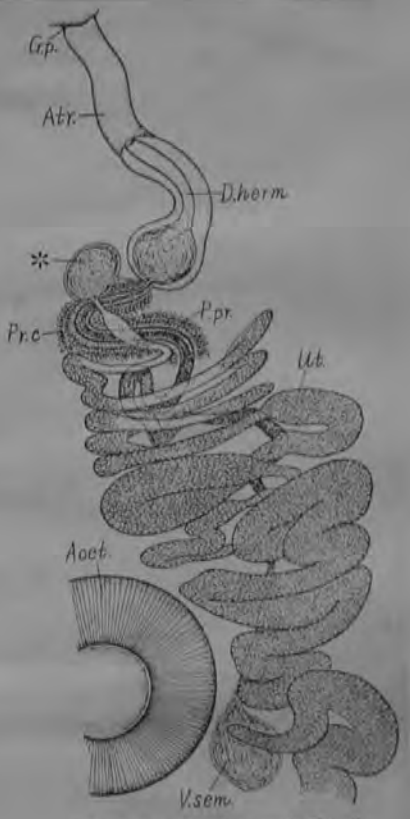
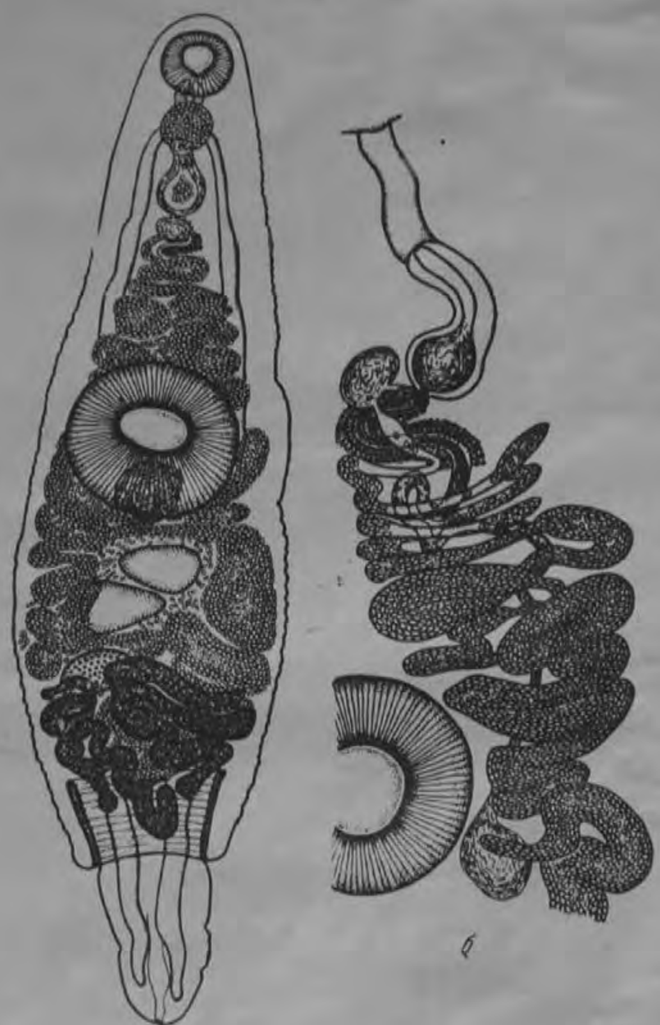


Fig. 110. Terminal genitalia of *Ectenurus hamati*; ventral view.
* Saccular swelling of uterus.

UTEROVESICULURUS HAMATI (Yam, 1934)



146. *Uterovesiculurus* [illegible] (Yamaguti, 1934) Skrjabin et Guschanskaja, [illegible] Ямагути, 1934)

а — [illegible] б — [illegible] аппарат

-OVER-

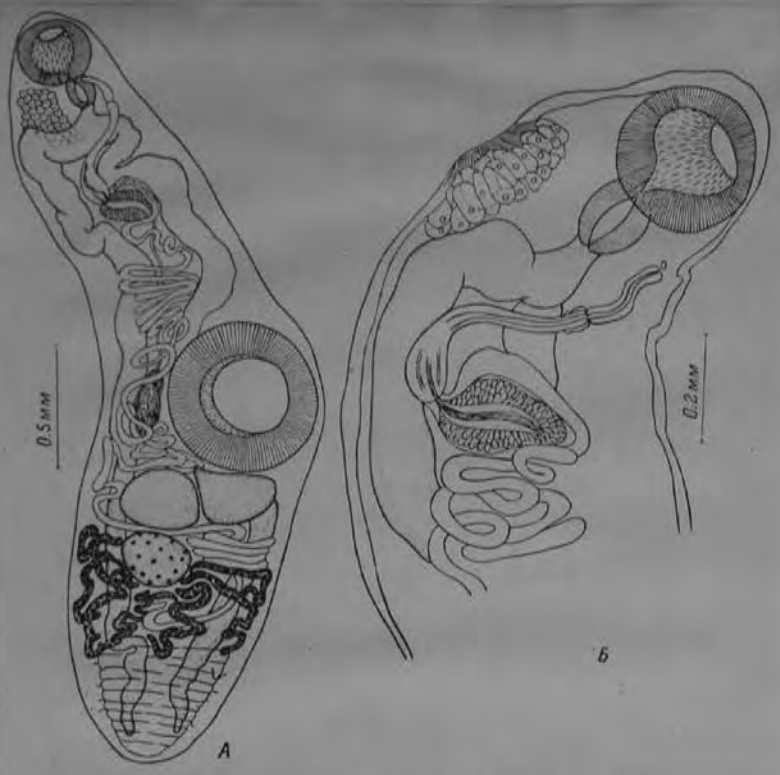


Рис. 9. *Uterovesiculurus hamati* (Yamaguti, 1934).
А — взрослая особь; Б — терминальный участок полового аппарата.

Ex. Polynemus heptadactylus
Otolithoides brunneus
Sillago panijius

Loc. INDIA
Ref. ZHUKOV, 19?? undated reprint

✓

Erilepturus
~~Ectenurus~~ lemeriensis (Tubangui & Masilungan, 1935) Manter, 1947

Length 2.5 to 3.2
Width 0.80 to 0.95
Oral sucker 0.24 to 0.28 by 0.25 to 0.31
Pharynx 0.13 to 0.15 by 0.12 to 0.15
Acetabulum o.55 to 0.68 by 0.53 to 0.66

Testes oblique, partly overlapping immediately behind acetabulum.
Seminal vesicle oval, slightly to one side of median line, almost entriely overlapped by acetabulum
Pars prostatica median, about halfway between pharynx and acetabulum.
Sinus sac pyriform to oval, immediatley behind pharynx
Genital pore median to submedian, opposite anterior level of pharynx.

Ovary in posterior third, oval to pear-shaped, submedian.
Vitellaria in coiled tubes, four pair.
Eggs 15 to 17 by 9.6 to 12 μ
Uterus does not extend posterior to ovary.

Host: Scomberoides sp., leather jacket
Location: intestine
Locality: Luzon, Philippines.

Compared with E.hamati Yamaguti ~~-by-shape~~
Differs in shape of testes which are oval or globular instead of wedge-shaped, by absence of saccular swelling at the terminal portion of the uterus, and by the greater development of the vitellaria.

Erilepturus lemeriensis
(Tubangui and Masilungan, 1935)
Manter, 1947
(fig. 3)

Host: *Scomberoides lysan* (Forskål)
Location: Stomach.
Locality: Navotas and Malabon (open sea), Rizal, Luzon Island.
Neotype: U. S. Nat. Mus. Helm. Coll. No. 59840. University of the Philippines, Zoology Discipline. Helm. Coll. Nos. 450d$_2$, 490d$_2$, 548d$_2$, 562d.

Prevalence: Eleven specimens from four of nine hosts examined.

Redescription (measurements based on six gravid specimens): Body smooth, elongate, 2.59 to 3.09 long, greatest width 0.55 to 1.04. Ecsoma usually extended, length variable, 0.48 (retracted) to 1.38 (fully extended); width at base 0.32 to 0.6. Preoral lobe prominent; oral sucker 0.13 to 0.16 by 0.16 to 0.18. Acetabulum at middle of body, 0.37 to 0.53 by 0.37 to 0.46. Sucker ratio 1:3. Pharynx globular to subglobular 0.07 to 0.10 by 0.07 to 0.11; esophagus short, thin-walled sac; ceca extending into posterior tip of ecsoma. Testes globular to subglobular, posterior to acetabulum; diagonal to nearly symmetrical (in partly retracted specimens); anterior testis or left testis (when symmetrical) 0.16 to 0.35 by 0.15 to 0.23; posterior testis or right testis (when symmetrical) 0.16 to 0.23 by 0.16 to 0.21. Seminal vesicle posterodorsal to acetabulum, large, elongate, sacciform 0.21 to 0.34 by 0.07 to 0.097. Efferent duct narrow, long, continuing anteriorly to form short, elongate pars prostatica surrounded by prostate cells. Peculiar expansion of uterus united with the distal end of pars prostatica forming ductus hermaphroditicus, latter enclosed in muscular hermaphroditic sac. Vesicular uterine expansion (in neotype) overlapping hermaphroditic sac at its base. Hermaphroditic duct opening into elongate genital atrium; genital pore at anterior level of pharynx. Ovary globular to subglobular, 0.16 to 0.23 by 0.20 to 0.26, in posterior one-fifth of body; germiduct from posterior side of ovary uniting with receptaculum seminis and receiving at this level vitelline duct. Receptaculum seminis 0.046 to 0.069 (three specimens), not clearly discernible in others. Ootype not seen. Mehlis' gland subglobular, lying immediately posterodextral to ovary. Vitellaria tubular, four dextral and three sinistral extending slightly posterior to ecsoma-body junction. Receptaculum seminis ad uterinum present. Uterus entering ecsoma. Eggs 11 to 15 by 6 to 9 μ. Excretory bladder bifurcating at level of anterior testis; lateral arms uniting at dorsal side of pharynx; excretory pore terminal.

Remarks: Tubangui and Masilungan (1935) noted the close resemblance of *Erilepturus lemeriensis* (Tubangui and Masilungan, 1935) Manter, 1947 to *Uterovesiculurus hamati* (Yamaguti, 1934) Skrj. and Guschans., 1954. *E. lemeriensis*, the only hemiurid ever described from Philippine fishes, was collected from the intestine of a marine fish, the leather jacket, *Scomberoides* sp. (type host) from Balayan, Lemery, Batangas, Luzon Island, Philippines (type locality). Again it was reported by the same authors (1944) from the intestine of a fresh-water fish *Glossogobius giurus* Bloch from Manila. The 1944 report was based upon specimens collected by ichthyology students from the University of the Philippines. It is likely that the host was not identified properly.

3

Manter (1947) transferred Tubangui and Masilungan's species to the genus *Erilepturus* Woolcock, 1935, and later it was reassigned by Yamaguti (1958) to *Ectenurus* Looss, 1907. In 1954 Skrjabin and Guschanskaja transferred all species of *Ectenurus* characterized by the presence of a peculiar, conspicuous terminal dilatation of the uterus just before opening into the hermaphroditic duct, to the genus *Uterovesiculurus* Skrj. and Gusch., 1954. Yamaguti (1958), agreeing with Skrjabin and Guschanskaja (1954), placed *U. hamati* (Yamaguti, 1934) Skrj. and Gusch., 1954, syn. *Ectenurus h.* Yam. and *Erilepturus h.* (Yam.) Manter, 1947; *U. paralichthydis* (Yam., 1934) Skrj. and Gusch., 1954 syn. *Ectenurus p.* Yam.; *U. platycephali* (Yamaguti, 1934) Skrj. and Gusch., 1954 syn. *Ectenurus p.* Yam. under the subfamily Dinurinae Looss, 1907. However, in recent studies Manter and Pritchard (1960b) placed *Erilepturus* in the subfamily Lecithochiriinae Lühe, 1901 and noted that the uterine swelling is not always present within a single species (*Tubulovesicula angusticauda*). In view of the above, the uterine swelling cannot be considered a generic character. I agree with Manter and Pritchard (1960b) that *Uterovesiculurus* should be a synonym of *Erilepturus*.

As has been stated in my previous papers, Tubangui's collections were lost during World War II and hence examination of his type specimens is not possible. However, Tubangui and Masilungan were aware of the absence of a saccular swelling at the terminal portion of the uterus and mentioned four pairs of vitelline tubules in their specimens of *E. lemeriensis*. My specimens approach those of Tubangui and Masilungan's species in general morphology and measurements including egg size, but differ in the presence of a saccular terminal expansion of the uterus and the number of the vitelline tubules which is seven and not eight. It is probable that the uterine swelling must have been missing in their specimens although present in all the present material examined by me. I am not inclined to regard the missing vitellarian tubule as a specific character.

In view of the above considerations and the redescription presented, a neotype in a similar host in a new locality is proposed.

FROM VELASQUEZ 1965

Erilepturns lemeriensis (Tubangui and Masilungan, 1934) Manter, 1947

Syn. *Ectenurus lemeriensis* Tubangui and Masilungan, 1934.

(Fig. 4)

4

The following study is based upon four specimens collected from the stomach of one specimen of *Scomberoides* sp. from Karachi (Arabian Sea).

The body of the fluke is elongated, somewhatfusiform and appendiculate, with maximum width at about the acetabular region. The tail is shorter than the body and may be completely extended or partly invaginated. The tegument is thick and devoid of any armature. The mouth is surrounded by a fairly well-developed, subterminal and almost globular oral sucker which is preceded by a very short preoral lobe. The ventral sucker is muscular and well-developed, lying in the middle third of the body proper at a distance of 0.909-1.050 mm from the anterior extremity of the body. It is more than three times as large as the oral sucker. Prepharynx is absent. The globular pharynx has a feebly developed musculature and is smaller than the oral sucker. The oesophagus is very short, with the intestinal bifurcation close behind the pharynx. The caeca are long and extend back well into the tail, terminating a short distance in front of the posterior end of the tail.

The gonads are disposed in the post-acetabular region of the worm. The testes are rounded, diagonal subequal in size, with even outlines and are placed at a distance of 0.164 mm behind the ventral sucker. The seminal vesicle is large, saccular and is not enclosed within a cirrus pouch. Anteriorly it extends to the anterior testis. The ductus ejaculatorius is long, winding and is only distally surrounded by prostate gland cells. Anteriorly it receives the metraterm and collectively constitute a hermaphroditic duct which is enclosed within a hermaphroditic bursa. The latter communicates with the exterior through a genital atrium, placed at the anterior end of the bursa. The ovary is oval, post-testicular and submedian, lying in the posterior third of the body proper. It is elongated anteroposteriorly and larger than the testes. Receptaculum seminis is present. The vitellaria consist of seven winding digitiform tubes, with one of the tubes extending into the proximal part of the tail. The uterus is extensive with numerous coils between the proximal part of the tail and the middle of pre-acetabular region of the body. At places the uterus extends into the extracaecal fields. Anteriorly the uterus continues into the metraterm. The eggs are numerous, small, oval, yellow, operculates and embryonated. The excretory vesicle is Y-shaped.

Host: *Scomberoides* sp.

Location: Stomach

Locality: Karachi (Arabian Sea)

Measurements

(All measurements in millimetres)

Body length (without tail)	1.999 – 2.727
Body breadth	0.696 – 0.727
Preoral lobe	0.058 – 0.068
Tail	0.484 – 1.060
Oral sucker	0.107 – 0.156 × 0.147 – 0.176
Ventral sucker	0.450 – 0.588 × 0.460 – 0.627
Pharynx	0.063 – 0.102 × 0.053 – 0.107
Ovary	0.245 – 0.196 ×
Anterior testis	0.147 × 0.147
Posterior testis	0.176 × 0.147
Seminal vesicle	0.392 × 0.196
Vitelline tubes	0.196 – 0.043 × 0.039 – 0.078
Eggs	0.015 – 0.020 × 0.010 – 0.012

Discussion

The specimens under study resemble *Erilepturus lemeriensis* (Tubangui and Masilungan, 1943) Manter, 1947, as described by Velasquez (1962) in all essential features and have been identified as such. However, this species is being reported for the first time from Pakistan.

From BHUTTA AND KHAN, 1975

GU CHANGDONG AND SHEN, JIWEI, 1978

9. ***Uterovesiculurus lutianius*** ~~**sp. nov.**~~(fig. 9)

This species differs from all the described species of the genus in: (1) the position of the acetabulum and its size, (2) the position of the seminal vesicle, (3) the triangular shape of the testes, (4) the size of the ova, and (5) the host is also worthy of note.

图 9 笛鲷泡宫吸虫，新种 *Uterovesiculurus lutianius* sp. nov. 的腹面

Erilepturus
~~Ectenurus~~ paralichthydis (Yamaguti, 1934) Manter, 1947

Host: Paralichthys olivaceus (Temm. & Schl.)

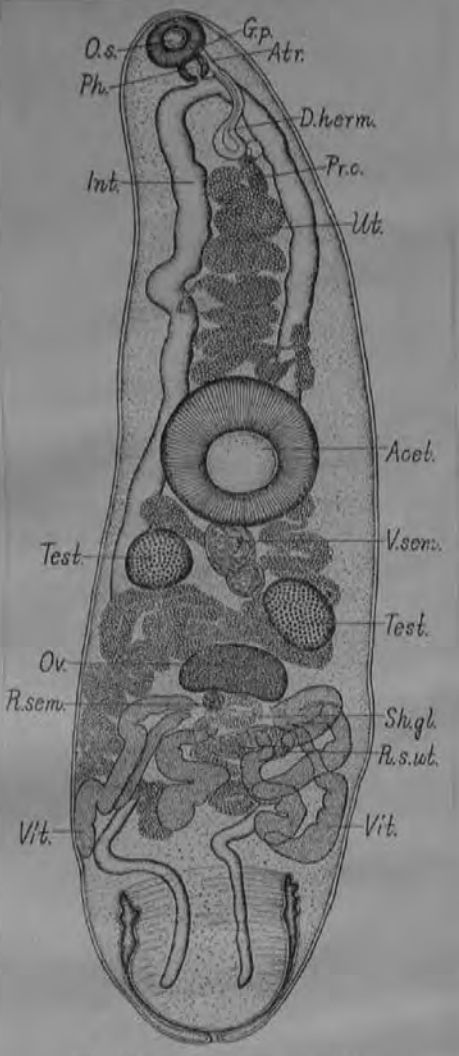


Fig. 112. *Ectenurus paralichthydis*; ventral view.
Type, body proper 3.56 mm long.

Distinguished from E. hamati by position of testes, the bipartite character of seminal vesicle, the size of eggs, and the host. Specific diagnosis reserved until more perfect specimens available.

Hemiuridae

Erilepturus

~~Ectenurus~~ platycephali (Yamaguti, 1934) ~~Manter, 1947~~ Manter & Pritchard 1960

This species bears a marked resemblance to E. paralichthydis in general anatomy, but differs distinctly in the size of the body and the extent of the uterus. The apparently abnormal character of the vesicula seminalis in one paratype is probably due to its being empty. The unusual commencement of the anteriormost vitelline lobes in the smaller paratype is not of much importance in view of the exceedingly variable character of the gland.

Host: Platycephalus indicus

Lake Hamana, Japan

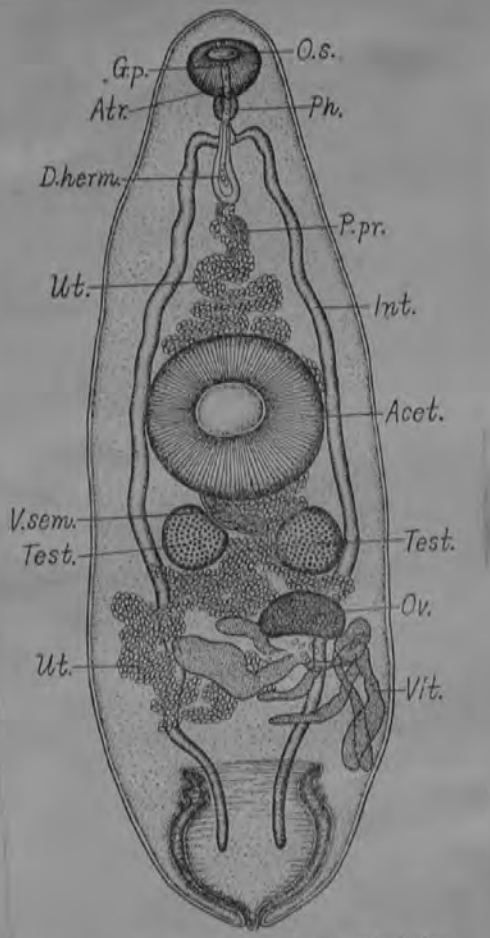


Fig. 113. *Ectenurus platycephali*; ventral view. Type, body proper 2.22 mm long.

Erilepturus platycephali (Yamaguti, 1934) Manter and Pritchard, 1960 (Fig. 1)

SYNONYMS: *Ectenurus platycephali* Yamaguti, 1934, *Uterovesiculurus platycephali* (Yamaguti, 1934) Skrjabin and Guschanskaja, 1954.

HOST: *Platycephalus indicus* (Platycephalidae).

HABITATS: Stomach and small intestine.

LOCALITY: Jesselton, North Borneo.

DATE: 29 August 1960.

SPECIMENS: U.S.N.M. Helm. Coll. No. 60071 (two slides).

MEASUREMENTS AND SOME PERTINENT DATA (based on two specimens mounted in lateral view, measurements are length by depth): Body 1,925 to 2,905 by 730 to 1,500, ecsoma retracted except for pointed tip in one; oral sucker 192 to 295 by 133 to 247, acetabulum 380 to 725 by 270 to 660, sucker length ratio 1 : 1.98 to 2.46; glandular pit lying dorsal to oral sucker or to latter and pharynx, 169 to 242 by 85 to 167, large gland cells in single layer with large vacuole displacing nucleus and cytoplasm against cell membrane; pharynx 92 to 133 by 82 to 143; testes (in smaller specimen) 243 at diameter, seminal vesicle (in one) 270 by 142, muscular, thick walled, dorsal to acetabulum; proximal portion of pars prostatica (in one) 210 by 18, distal portion inflated into vesicle 123 to 205 by 54 to 80 and surrounded by dense mass of prostate cells; hermaphroditic duct 315 to 460 by 19 to 27; sinus sac 230 to 336 by 70 to 111 proximally and 30 to 31 distally; ovary (in smaller specimen) 296 by 202; uterine vesicle 734 to 135 by 101 to 135; 15 eggs measuring 15 to 19 by 10 to 14.

DISCUSSION: This species has been described by Yamaguti (1934, 1938) from the same host species from Japan. No mention was made of a dorsal, glandular pit. Velasquez (1962) reviewed the status of the genus.

FROM FISCHTHAL AND KUNTZ (1965)

Hemiuridae

Erilepturus platycephali (Yamaguti,1934) Manter & Pritchard,1960

From Yamaguti, 1938

94. *Ectenurus platycephali* Yamaguti, 1934

Two mature specimens were found in the stomach of *Platycephalus indicus* (Linné) from Lake Hamana. They were fixed in acetic sublimate under cover glass pressure and stained with Heidenhain's hematoxylin. The following note based on these two mounts is to supplement my previous description of the species.

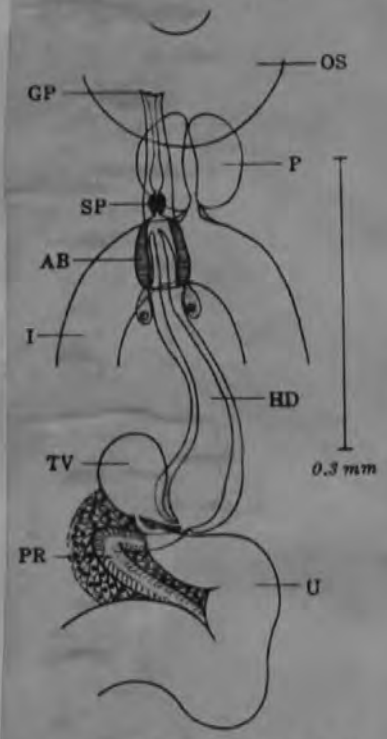


Fig. 73. Terminal genitalia of *Ectenurus platycephali* Yamaguti, 1934; ventral view.

Body 2.8-3.0×0.87-1.0 mm, broadest at level of testes. Oral sucker, pharynx and acetabulum measuring respectively 0.2-0.22 mm, 0.1-0.11 mm and 0.438-0.5 mm in diameter. Testes 0.175-0.28 × 0.188-0.3 mm, ovary 0.15-0.188×0.25 mm. Eggs 23-24 × 13-15 μ in life. The uterus passes between the ovary and the left testis and comes to lie partly dorsal to the right testis, but does not extend into the space between the acetabulum and the testes. The hermaphroditic duct, enclosed in a club-shaped pouch of longitudinal muscles, is enlarged posteriorly and opens into the muscular bulb-like portion of the genital atrium (AB). On each side of the distal end of the duct there is an elliptical cell containing an oval nucleus and fine protoplasmic granules, with its anterior end attached to the posterior end of the bulb mentioned above. The genital atrium is divided into two portions of different structure; the proximal portion forms a muscular bulb 72 μ long by 60 μ broad, into which the hermaphroditic duct may be protruded; the distal portion is enclosed in a cylindrical sheath and provided at its short, narrow, posterior portion with a globular sphincter (SP) 27 μ in diameter. In front of this sphincter the genital atrium may be dilated to some extent.

Literature

Yamaguti, S. Studies on the helminth fauna of Japan. Part 2. Trematodes of fishes, I. Jap. Jour. Zool., 5/3, 1934, p. 462-468.

GU CHANGDONG AND SHEN, JIWEI, 1978

10. *Uterovesiculurus sinensis* ~~**sp. nov.**~~(fig. 10)

This species is distinguished from the most closely related species *U. sphyraena* Yamaguti, 1970 by the posterior position of the vitellaria, the size of the egg and by the difference of the hosts.

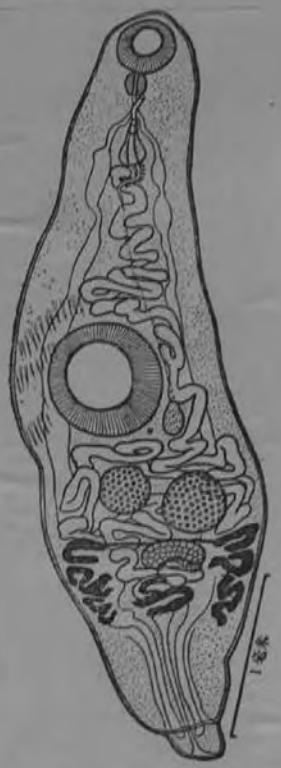


图 10 中国泡宫吸虫,新种 *Uterovesiculurus sinensis* sp. nov. 的腹面

159. *Uterovesiculurus sphyraenae* n. sp. Yam., 1970
(Fig. 159)

HABITAT: Stomach of *Sphyraena barracuda*; Hawaii.
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63751.
DESCRIPTION (based on two strongly flattened whole mounts): Body stout, elongate, somewhat fusiform, 7.5-7.8 × 2.4-2.5 mm, widest in ovariotesticular region, covered with thick smooth cuticle. Tail plump, 1.5-1.6 mm. long, with rounded end. Oral sucker 0.42-0.43 × 0.52-0.55 mm, with preoral lobe; pharynx 0.15-0.2 × 0.25-0.26 mm. Esophagus short, turned dorsad; ceca a little sinuous, terminating nearly at posterior end of tail. Acetabulum about 1.0 mm in diameter, situated at junction of anterior with middle third of body, with six rather flat cuticular papillae along its inner margin.

Testes round to oval, 0.42-0.48 × 0.47-0.75 mm, oblique, contiguous, a little behind acetabulum in equatorial region. Seminal veicle undivided, saccular, posterodorsal to acetabulum, thin-walled in the type, but provided with muscular walls of longitudinal muscles in the paratype. The duct connecting the seminal vesicle with the pars prostatica is narrow and very long (about 1.0 mm); pars prostatica also comparatively long. Ductus ejaculatorius short, narrow, joining metraterm at base of hermaphroditic pouch. Hermaphroditic duct about 0.6 mm long in the type, enclosed in a muscular pouch largely composed of circular muscles and strong longitudinal muscles, forming at its base a bulbous swelling, whose inner surface has a villous cuticular lining. Except for this basal swelling the hermaphroditic duct is lined with thick smooth cuticle, and when everted, it opens not at the middle of the tip of the everted portion but at its side. Genital pore median, ventral to esophagus or intestinal bifurcation.

Ovary bean-shaped, 0.2-0.34 × 0.35-0.6 mm, situated at posterior end of middle third of body. The germiduct arising from the dorsal side of the ovary passes backward to be enclosed in the rounded shell gland complex delimited by connective tissue capsule, in which the retort-shaped seminal receptacle and the narrow convoluted initial portion of the uterus are embedded. Vitellaria divided into seven, slender, winding, digitiform lobes radiating from behind ovary, four lobes on the right and three on the left; some of the backwardly directed lobes extending into basal portion of tail. Uterine coils descending into basal portion of tail, and occupying inter- and extracecal fields. In the paratype the muscular terminal portion of the uterus, the metraterm, forms a conspicuous spherical dilatation about 0.3 mm in diameter. In the type, however, the metraterm forms a fusiform swelling instead. Eggs thick-shelled, elliptical to elongate pyriform, 20-22 × 10-12 μ in life. Excretory arms uniting dorsal to oral sucker or pharynx.

DISCUSSION: This species differs from the most closely related *Uterovesiculurus hamati* (Yamaguti, 1934) Skrj. et Gusch., 1954 in body size and other principal measurements including egg length (20-22 μ vs. 18-19 μ), and in the acetabulum being located at the junction of the anterior with middle third of the body instead of being pre-equatorial. Yam., 1970.

161. *Erilepturus synodi* n. sp. Yam., 1970
(Fig. 161)

HABITAT: Stomach of *Synodus dermatogenys*, Hawaii.
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63753.
DESCRIPTION (based on three whole mounts): Body elongate, widest in midregion, whence it tapers more rapidly anteriorly than posteriorly, 3.8-5.3 × 1.0-1.3 mm. Cuticle thick, smooth. Tail 1.3-1.6 mm long, transversely wrinkled. Oral sucker subterminal, 0.15-0.24 × 0.2-0.3 mm, surmounted by simple prominent preoral lobe; pharynx 80-110 × 100-120 μ; esophagus very short, muscular; ceca terminating at posterior end of tail. Acetabulum 0.35-0.54 mm in diameter, situated at or near middle of anterior third of body.

Testes subglobular, comparatively small, 0.12-0.2 × 0.12-0.18 mm, situated nearly symmetrically behind acetabulum at posterior part of anterior third of body. Seminal vesicle tubular, 50-60 μ wide, commencing at level of posterior end of acetabulum or immediately behind it. Pars prostatica very distinct, sigmoid, 0.25-0.3 mm long lineally, with dense coat of prostate cells. Hermaphroditic duct muscular, somewhat swollen at base where it is directly continuous with pars prostatica, receiving metraterm dorsally, and enclosed in elliptical hermaphroditic pouch 0.13-0.16 mm long by 0.09-0.1 mm wide. The coarse longitudinal muscle bundles of the hermaphroditic pouch extend forward over the genital atrium. Genital atrium shallow, funnel-shaped, 20-50 × 70-90 μ, opening ventral to pharynx.

Ovary spherical to oval, 0.17-0.3 × 0.22-0.28 mm, situated ventrally at anterior end of middle third of body, with small seminal receptacle behind. Vitelline lobes digitiform, winding, four on the right and three on the left; right ones extending to near posterior end of acetabulum in the type, reaching as far back as equatorial level. Uterus first descending on the right, turning forward at base of tail, and then ascending on the left to acetabular level where it is continued into the metraterm. Eggs elliptical, thick-shelled, 32-40 × 16-23 μ in life. Excretory arms united dorsal to pharynx; pore terminal.
DISCUSSION: This species differs from the most closely related *Erilepturus trachinocephali* n. sp. (*v. i.*) in the testes being almost symmetrical in arrangement and in the prostatic complex being more weakly developed. In *E. trachinocephali* the thick layer of prostatic cells is delimited from the surrounding parenchyma by a membranous capsule.

Yam., 1970

162. *Erilepturus trachinocephali* n. sp. Yam., 1970
(Fig. 162)

HABITAT: Stomach of *Trachinocephalus myops*; Hawaii.
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63754.
DESCRIPTION (based on 33 whole mounts): Body elongate, finely annulated transversely on forebody, 1.4-6.0 mm long, 0.4-1.4 mm wide at ovarian level; tail smooth, 0.45-2.7 mm long when extruded. Oral sucker subterminal, 0.11-0.26 × 0.13-0.29 mm, surmounted by simple preoral lobe; pharynx 0.06-0.12 × 0.07-0.16 mm; esophagus 0.14 mm long in the type 4.3 mm long; ceca terminating near tail end. Acetabulum 0.21-0.5 × 0.23-0.56 mm, situated near middle of anterior third of body; sucker ratio 1 : 1.4-2.1.

Testes subglobular, 0.09-0.24 × 0.1-0.3 mm, obliquely tandem about halfway between acetabulum and ovary; usually right testis posterior to left one, and occasionally very close to ovary. Seminal vesicle tubular, though swollen posteriorly up to 50-80 μ wide (exceptionally 150 μ), usually sigmoid or winding, posterodextral to acetabulum, with its attenuated anterior end leading into pars prostatica. Pars prostatica usually sigmoid, 0.15-0.5 mm long lineally, extending forward from anterodorsal side of acetabulum, with very thick coat of cylindrical prostatic cells which stand at right angles to the duct and are sharply delimited from the surrounding tissue by a membranous capsule. Hermaphroditic duct muscular, 0.09-0.26 mm long, swollen at its base up to 58 μ wide, enclosed in oval, elliptical, or subcylindrical hermaphroditic pouch of strong longitudinal muscles, opening into funnel-shaped genital atrium which is 50 μ long by 70 μ wide in the type. Genital pore ventral to oral sucker or pharynx.

Ovary subglobular to transversely elongated oval, 0.06-0.23 × 0.1-0.3 mm, pre- or postequatorial. Seminal receptacle oval, 0.14 × 0.13 mm in the type. Vitellaria divided into seven distally enlarged, moderately long, digitiform lobes (four on the right and three on the left or *vice versa*), whole organ extending 0.3-0.95 mm anteroposteriorly. Uterine coils descending into tail, then ascending on left side of ovary, crossing left vitelline lobes ventrally to pass between two testes and between testes and acetabulum; metraterm running straight forward from dorsal side of acetabulum to open from dorsal side into hermaphroditic duct at middle of its basal swelling. Eggs oval to elliptical, 32-42 × 20-23 μ. Excretory vesicle bifurcating immediately behind acetabulum; arms uniting dorsal to pharynx.

DISCUSSION: This species differs from the most closely related *Erilepturus synodi* n. sp. in the prostatic cells being strongly developed and separated from the surrounding parenchyma by a membranous capsule.

Yam., 1970.

GU CHANGDONG AND SHEN JIWEI, 1978

6. *Erilepterus trichiuri* ~~**sp. nov.**~~ (fig. 6)

This species differs from the most closely related *E. trachinocephali* Yamaguti, 1970 in the position of the testes and the pars prostatica, in the prostatic cells without a membranous capsule, in the size of the ova and also in the host.

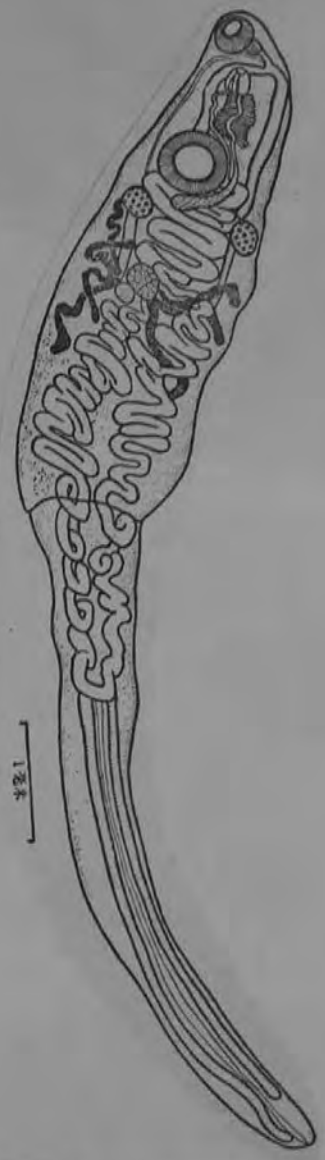


图 6 带鱼细尾吸虫，新种 *Erilepterus trichiuri* sp. nov. 的腹面

1981. GU AND SHEN report this species from Trichiurus haumela (Forskål) in China Seas.

ERILEPTURUS