1990

Binder 088, Haplosplanchnidae A-Z [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

HAPLOSPLANCHNIDAE Poche, 1925

Family diagnosis. — Small distomes with single intestinal limb. Oral sucker and pharynx well developed. Acetabulum large. Testes single, in hindbody. Cirrus and cirrus pouch absent. Ovary pretesticular. Vitellaria follicular or acinous, lateral, in hindbody, sometimes intruding into forebody. Receptaculum seminis present. Laurer's canal present or absent. Uterus coiled between testis and genital pore. Eggs containing miracidia. Excretory vesicle Y-shaped. Parasites of marine fishes.

Key to genera of Haplosplanchnidae

1. Vitellaria extending on each side of body from level of pharynx or acetabulum to posterior extremity *Schikhobalotrema*
   Vitellaria poorly developed anterolateral to testis 2
2. Posterior extremity semispiral; Laurer's canal present .... *Laruea*
   Posterior extremity not semispiral; Laurer's canal absent ..... *Haplosplanchnus*

HAPLOSPLANCHNIDAE Poche, 1926

Oral sucker well-developed and a very large deep sac-like ventral sucker lying in a thickening of the body; unspined cuticula; a very short prepharynx, pharynx, a short esophagus, a short unforked cecum, limi ted to anterior half of body, straight, median; ~~ventral sucker shortly behind the oral sucker~~ excretory vesicle Y-shaped opening at hind end, long stem to testis and branches to region of ovary; genital pore median, ventral shortly behind the oral sucker; genital atrium present; one testis, large, entire, elongate-oval some distanee from hind end, coiled vas deferens serving as seminal vesicle; no cirrus or cirrus sac; ovary median, directly in front of testis; vitellaria rather weakly developed, not clearly paired, dorsal between cecum and testis; large sac-like seminal receptacle; no Laurer's canal; uterus narrow moderately coiled; eggs medium-sized, thin-shelled, without filament; miracidium fully developed at time of egg laying. In fish.

Type: Haplosplanchus Looss, 1902.

Haplosplanchnus Looss, 1902

Generic diagnosis. — Haplosplanchnidae: Body somewhat fusiform, more pointed posteriorly than anteriorly. Acetabulum more or less elongated, equatorial or pre-equatorial, retracted into body parenchyma or projecting prominently. Prepharynx and esophagus short. Cecum may or may not reach to testis. Testis at about middle of hindbody, or nearer posterior extremity. Vesicula seminalis long and slender. Pars prostatica elongated, surrounded by prostate cells, opening directly into genital sinus. Genital pore median, just behind oral sucker. Ovary median or submedian, between acetabulum and testis. Vitellaria rather poorly developed anterolateral to testis. Uterine coils chiefly between acetabulum and ovarian complex. Excretory stem reaching to testis, arms extending to near anterior extremity. Parasitic in intestine of marine fishes.

Genotype: ***H. pachysomus*** (Eysenhardt, 1829) Looss, 1902 (Pl. 15, Fig. 187), in ***Mugil auratus*** and *M. cephalus;* cosmopolitan.

Other species:

H. purii **Srivastava, 1939,** in *Mugil waigiensis;* Puri, Karachi.

Haplosplanchnus

SYN-

Laruea Srivastava, 1939

Generic diagnosis. — Haplosplanchnidae: Body small, smooth, Y-shaped, with unequal arms and semispiral posterior end. Oral sucker subterminal, followed by small prepharynx; pharynx small, dome-shaped; esophagus continued into straight single cecum ending in anterior half of body. Acetabulum long, tubular, club-shaped, in longer arm of body. Testis single, postequatorial. Seminal vesicle tubular, sinuous, pars prostatica small, prostate cells well developed. Genital sinus tubular, opening in angle of two arms. Ovary immediately pretesticular, small. Receptaculum seminis and Laurer's canal present. Vitellaria poorly developed in lateral fields anterior to testis. Uterus coiled between ovary and acetabulum; eggs embryonated; miracidia with prominent eye-spots. Excretory vesicle Y-shaped with short stem and fairly long cornua. Parasitic in intestine of fishes.

Genotype: *L. caudata* **Srivastava, 1939** (Pl. 37, Fig. 475), in *Mugil waigiensis*; **Puri and Karachi, Bay of Bengal and Arabian Sea.**

HAPLOSPLANCHNUS Looss, 1902

Body small, very contractile but relatively little muscular, thicker anteriorly, much narrowed and almost pointed posteriorly. Suckers near together, the oral sucker of ordinary form, the ventral sucker deeply sac-like, cylindrical and lying in a thickening of the body which rises over the sucker in the form of a plump stalk which can be drawn back into the body. The wall of the sucker contains at its opening a peripherally lying strong sphincter and between the muscle fibers are numerous cellular layers lacking only in the region of the outer opening. In stained preparations the sucker stands out as a rather thick almost granular sac. The oral sucker shows the ordinary structure and possesses in the middle of the v ventral border a small canal-like depression surrounded by circular myuscles and which can be everted a a fine, papilla-like point. On the significacne of this Looss does not profess to say. The skin is thin and smooth/. After the oral sucker follows a very short prepharynx, then a well-developed spherical or slightly pyriform pharynx which leads to a cuticula-lined esophagus. The intestine is represented by a simple tube lined with a relatively tall epithelium which can apparently be lenghtened and shortened. It is limited to the anterior half of the body. The excretory pore lies at the end of the body and leads by a short, narrow canal into a Y-shaped vesicle the# often widened stem of which reaches to the testis. The 2 branches extend dorsally about to the level of the ovary where they pass over into vessels which, coiling, extend into the forebody where they seem to turn back. The genital pore lies median, shortly behind the oral sucker; organs of copulation are lacking. The relatively long, canal-like genital sinus leads at its end into double passageways; the male begins with a tube-like pars prostatica the very large and rather numerous prostate cells lie around it ###### and stretch out into the parenchyma. The vas deferens extends posteriorl in numerous coils and throughout it s length is filled with sperm cells and corresponds to a seminal vesicle. There is a single, elongate-oval testis lying near the hind end. Directly in front of it median or by contraction displaced to one side is a spherical ovary. Large sac-like seminal receptacle with its blind end directed foward lie dorsal and more or less anterior to the ovary; a Laurer's canal is lacking. A paired condition of the vitellaria is not pronounced; they are poorely developed and broaden beneath the dorsal surface sometimes more toward the right ,sometimes more toward the left. The uterine coils are fairly numerous and narrow so that eggs usually lie in a single row. The end region of the uterus before entrance into the genital sinus is not differentiated. The eggs are of medium size, thin-shelled and contain a mature miracidium. Type: H. pachysoma (Eysenh.)

Species : H. pachysomus

H. sparisomae Manter, 1937

H. obtusus "

H. brachyurus "

H. pomacentri "

H. acutus "

H. pirii Srivastava, 1939

H. kyphosi Manter, 1947

H. griellae Manter & VanCleave, 1951

Haplosplanchnus pachysoma (Eysenhardt,1829) Looss,1902

Specific diagnosis as given by Looss,1902:

Length 3.3 mm. Diameter of suckers about equal, 0.35 mm. Depth of ventral sucker 0.8 mm. Pharynx diameter 0.2 mm/ The intestine reaches in expanded condition to the hind edge of the ventral sucker. The vitellaria extend foward not much over the end of the seminal receptacle, the uterine coils extend posteriorly to the anterior edge of the testis. An animal 1.2 mm. long contained eggs 40 by 26 µ. Amn animal 3. mm. long contained eggs 55 by 31 µ/ A large black eye-spot on the miracidium.

Type host: Mugil auratus

Collected by Looss from several species of Mugil at Trieste.

Reported by Yamaguti (1934) from Mugil cephalus from the Inland Sea, Japan. He says: living worms brownish yellow in color. The excretory vesicle is divided into two parts; the posterior is an elongated sac extending to near the testis, but the anterior is relatively narrow and bifurcates just behind the testis into lateral arms passing fowards along the lateral borders of the testis. Elongate oval seminal vesicle. Embryonated eggs in uterus, some of which hatch in the uterus; empty shells in the uterus measure 60 to 70 by 27 to 30 µ. Miracidia with X-shaped eye and stylet.

from Dawes after Fuhrmann also after Looss, 1902 (in reprint)

Haplosplanchnus pachysomus (Eysenhardt, 1829) Looss, 1902

Synonyms: *Distoma pachysoma* Eysenhardt 1829; *Podocotyle pachysomum* (Eysenhardt, 1829) Stossich, 1898.

Hosts: *Mugil cephalus* and *M. ramada* (Mugilidae).

Habitat: Small intestine.

Locality: Giza Fish Market, Giza Province, Egypt.

Dates: 22 November 1952 (*M. cephalus*), and 23 December 1953 (*M. ramada*).

Specimens deposited: USNM Helm. Coll., No. 59824 (one slide with three worms from *M. ramada*), and No. 59825 (one slide with one worm from *M. cephalus*).

The one specimen from ***Mugil cephalus*** and the 38 from a single ***M. ramada*** agree with the description of ***Haplosplanchnus pachysomus*** from ***Mugil cephalus*** and ***M. chelo*** at Trieste

esented by Looss (1902b). Looss's specimens were up to 3.3 mm in length. This parasite has been recorded by a number of investigators from *Mugil* spp. from the Mediterranean Sea. Yamaguti (1934) reported it from *M. cephalus* from Japan, and he (1958) noted that it was cosmopolitan. Skrjabin and Guschanskaja (1955) reviewed the family Haplosplanchnidae, erecting the subfamilies Haplosplanchnidae, for *Haplosplanchnus* (syn. *Laruea* Srivastava, 1939), and Schikhobalotrematinae for their newly erected genus *Schikhobalotrema* (syn. *Derodena* Linton, 1910, in part). They presented data on *H. pachysomus* by Looss in 1902 and Yamaguti in 1934. Additionally, they mentioned the reports of this parasite from the Black Sea by Vlasenko in 1931 from *M. cephalus* and Osmanov in 1940 from *M. auratus*. Data on the latter's observation were also given. *H. pachysomus* was recorded from *M. saliens* from the Caspian Sea by Mikailov (1958). Sogandares and Sogandares (1961) reduced the genera *Schikhobalotrema* and *Laruea* to subgenera in the genus *Haplosplanchnus* Looss, 1902, and created the subgenus *Haplosplanchnus*. They placed *H. pachysomus* in the latter.

Because of the large, protruding acetabulum, adult worms can be mounted only in lateral view. Therefore, when specifying depth in measurements reference is to dorsoventral extent.

Description: Mean measurements (with minima and maxima in parentheses) of eight whole mount adults from *Mugil ramada*: body, length 1,430 (1,135 to 1,815), depth at acetabulum 810 (675 to 970), depth at testis 270 (185 to 365); oral sucker, length 200 (155 to 245), depth 205 (155 to 255); acetabulum, length 225 (195 to 240), depth 585 (365 to 680); pharynx, length 125 (100 to 140), depth 150 (135 to 160); testis, length 240 (170 to 315), depth 185 (120 to 240); posttesticular body length 250 (135 to 365); ovary, length 120 (105 to 140), depth 120 (90 to 160); 20 older intrauterine eggs 48 (45 to 54) by 26 (25 to 29).

Small but prominent irregularly shaped concretion of several irregular layers in excretory bladder or in one of arms near bladder of some *H. pachysomus*.

From Fischthal and Kuntz, 1963

Haplosplanchnidae

Haplosplanchnus caudatus (Srivastava, 1939) Skrjabin & Guschanskaja, 1955

LARUEA CAUDATUM GEN. ET. SP. NOV.[1]

Host.—***Mugil waigiensis*** Quoy and Gaim.

Habitat.—Intestine.

Locality.—Puri, Bay of Bengal.

Three specimens of this interesting trematode were collected from the gut of ***Mugil waigiensis*** examined at Puri in 1935. In the living state the parasite is light-brown in colour and does not appear to possess any marked power of contraction and expansion. It cannot remain alive outside the host for even a quarter of an hour. The trematode has a peculiar, plump, smooth body which is roughly Y-shaped with unequal arms and a broad stem with a semi-spiral end. In permanent mounts it measures 3·6 to 3·8* in length from the oral extremity to the hinder end and 1·2 to 1·4 from the genital pore to the acetabular end. The small, transversely oval, subterminal oral sucker, 0·2—0·24 × 0·28—0·35 in size, is followed by a small prepharynx, a dome-shaped pharynx 0·12×0·14—0·16 in size, and an oesophagus 0·32—0·5 long. Posteriorly the oesophagus is continued into a single straight caecum 0·4—0·8 × 0·14—0·16 in size. The acetabulum is a long club-shaped, tubular, muscular structure, 0·96—1·8 × 0·32—0·54 in size, situated in the longer arm of the Y-shaped body.

A single oval testis, 0·44—0·54 × 0·32—0·4 in size, is situated a little behind the first half of the body length. The vesicula seminalis is a long, sinuous tube which opens at the level of the posterior end of the oesophagus into an elongated, oval pars prostatica surrounded by well-developed prostate glands. Terminally the pars prostatica opens into a tubular genital sinus. The genital pore lies at the bifurcation of the Y.

The small, spherical ovary of 0·18—0·28 size lies obliquely in front of the testis. The size of the receptaculum seminis varies from 0·16 to 0·4×0·2 to 0·5, depending on the amount of its contents. Though its position is slightly variable, it is always pre-testicular. A small Laurer's canal is given off from the duct of the receptaculum seminis. A diffuse shell gland mass lies between the receptaculum seminis and the ovary. The vitellaria are poorly developed and consist of long follicles which are confined to the space between the testis, the ovary, the blind end of the intestinal caecum, and the right body wall. The intricately coiled uterus is confined to the space between the testis and the acetabulum. The eggs are numerous, operculate, 0·038—0·04 × 0·019—0·023 in size, and contain developing miracidia with prominent eye-spots. Terminally the uterus opens independently of the male opening.

The excretory bladder is Y-shaped with a short, median stem and fairly long cornua.

The new genus, ***Laruea*** differs remarkably from the type genus in the peculiar shape of its body and of the acetabulum, and in the position of its gonads and vitellaria. In all other important features the two genera are alike.

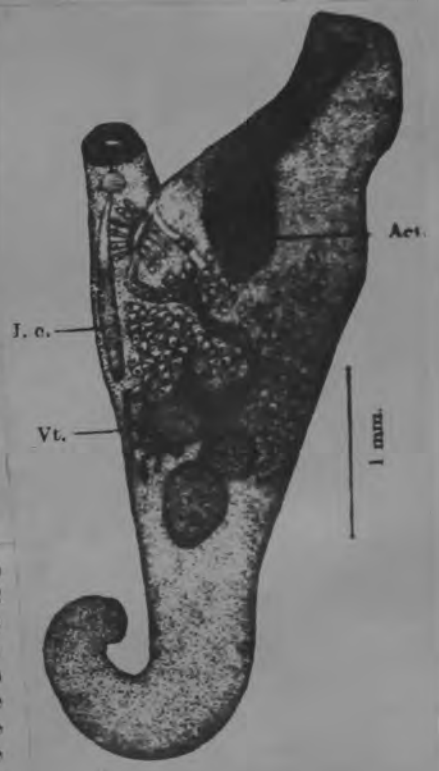


Fig. No. 1
Laruea caudatum.

(ovies)

GENERIC DIAGNOSIS OF "LAUREA"

Medium sized, plump, smooth, Y-shaped body with unequal arms and semi-spiral posterior end. Oral sucker oval, subterminal ; acetabulum long, tubular, club-shaped and muscular, situated in the longer arm of the Y-shaped body. Prepharynx small ; pharynx small and dome-shaped ; oesophagus smaller than the caecum ; caecum single, straight, ending blindly in front of the middle third of the body length. Testis oval, single, situated a little behind the anterior half of the body length. Vesicula seminalis tubular, sinuous ; pars prostatica small, oval with well-developed glands and opens into a tubular genital sinus in the angle of the Y. Ovary small, spherical and pre-testicular. Receptaculum seminis and Laurer's canal present. Vitellaria poorly developed and confined to the space between the testis, ovary, blind end of caecum and the right body wall. Uterus containing numerous eggs with developing miracidia having prominent eye-spots is confined between the acetabulum and the testis. Terminally uterus opens in the genital sinus independently of the male opening. Excretory bladder Y-shaped with small median stem and long cornua. Parasitic in marine fishes.

Type species.—*Laurea caudatum*.

Genus.—*Haplosplanchnus* Looss, 1902.

Haplosplanchnus purii, n. sp.

Host.—*Mugil waigiensis* Quoy and Gaim.

Habitat.—Intestine.

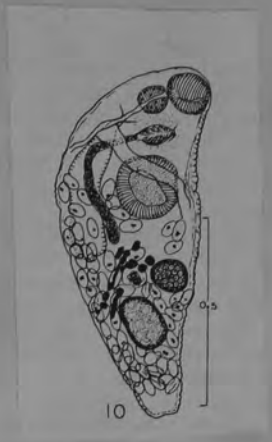
Locality.—Puri and Karachi, Bay of Bengal and Arabian Sea.

FAMILY HAPLOSPLANCHNIDAE
Roche, 1925

Haplosplanchnus **mugilis** n.sp.
Figure 10 Nahhas & Cable, 1964

Host: Mugil curema (C).
Site: intestine.
Holotype: U.S.N.M. 60259.

Description based on 13 specimens. Body elongated, tapering posteriorly, 0.780-1.15 long, 0.220-0.467 wide. Cuticle aspinose; eye-spot pigment present. Oral sucker 0.075-0.120 long, 0.083-0.135 wide; ventral sucker 0.138-0.180 long, 0.096-0.168 wide, on a short peduncle; sucker ratio 1:1.27-1.55. Prepharynx short; pharynx 0.037-0.063 in diameter; esophagus as long as pharynx; cecum extending to about anterior level of ovary. Testis entire, 0.150-0.165 long, 0.083-0.120 wide, about midway between acetabulum and posterior end of body; seminal vesicle tubular, sometimes reaching level of ovary; pars prostatica large, spherical to ovoid; prostate glands diffuse, inconspicuous; ejaculatory duct short. Ovary entire, anterior to testis, 0.090-0.120 long, 0.053-0.105 wide; seminal receptacle dorsal, near ovary; uterus extending posterior to testis. Genital pore midway between pharynx and acetabulum. Eggs 48-63 by 30-36 μ, containing oculate miracidia. Vitellaria of 10-12 inconspicuous follicles scattered between posterior edge of seminal vesicle and anterior third of testis. Excretory bladder not observed; its pore terminal.



10

This is the first species of *Haplosplanchnus* to be reported from the Gulf-Caribbean region. Of the 3 previously described species, *H. mugilis* is most like *H. pachysomus* (Eysenhardt, 1829), but differs in having a shorter seminal vesicle, shorter peduncle of the acetabulum, a spherical or ovoid pars prostatica and the uterus extending posterior to the testis. It differs from *H. caudatus* (Srivastava, 1939) in the same respects and also in body shape. In *H. purii* Srivastava, 1939, the testis is in the extreme posterior end of the body, the cecum and seminal vesicle are long, the vitellaria are compact, and the pars prostatica tubular.

Haplosplanchnus purii Srivastava, H.D. 1939

Host: Mugil waigiensis Quoy & Gaim
Habitat: Intestine
Locality: Puri and Karachi, Bay of Bengal and Arabian Sea

About a dozen specimens of this parasite were collected from the intestine of a food-fish obtained from the Bay of Bengal and the Arabian Sea. The body is fleshy, smooth and roughly triangular with broadly rounded off ends. In permanent mounts the trematode measures 1·5—2·3 in length and 0·54—1·2 in maximum breadth which occurs across the acetabular region. The anteriorly directed, cup-shaped oral sucker measures 0·08—0·22 × 0·25—0·34 in size. It is followed by a small and narrow prepharynx, a dome-shaped pharynx, 0·07—0·1 × 0·08—0·14 in size and an oesophagus, 0·12—0·18 × 0·08—0·12 in size. The oesophagus is continued posteriorly into a long, broad, tubular caecum 0·5—0·9 in length. The acetabulum is bowl-shaped and muscular and measures 0·22—0·34 × 0·24—0·38 in size. It is situated at the junction of the first and second thirds of the body length.

The single, ovoid testis, 0·2—0·3 × 0·18—0·28 in size, is situated close to the hinder end. The vesicula seminalis is a narrow, tubular and sinuous structure which opens anteriorly into a small pars prostatica surrounded by prostate glands. The pars prostatica opens anteriorly into a deep and narrow genital sinus. The genital pore lies on a prominent conical papilla, half way between the oral sucker and the acetabulum.

The ovary, 0·12—0·2 × 0·08—0·15 in size, lies close in front of the testis and is separated from the latter by the scythe-shaped vitellarium. A small, spherical or oval receptaculum seminis, 0·12—0·22 × 0·12—0·16 in size, lies in the neighbourhood of the ovary. The shell gland complex is situated in the space between the receptaculum seminis and testis. The vitellarium consists of a scythe-shaped structure, 0·15—0·43 × 0·04—0·08 in size, extending from the receptaculum seminis to the opposite body wall. The concavity of the vitellarium is directed anteriorly. The uterus is well developed and occupies the whole of the space between the vitellarium, intestinal caecum, acetabulum and the pars prostatica. It contains a large number of operculate eggs, 0·049—0·068 × 0·023—0·034 in size. They contain developing miracidia with prominent eye-spots. Terminally the uterus opens into the genital sinus independently of the male opening.

The excretory bladder is as in the type species.

Haplosplanchnus purii, n. sp. resembles the type species *H. pachysomus* (Eysenhardt) roughly in the shape of its body, the digestive system, the general topography of the gonads and the shape of the excretory bladder. It can, however, be distinguished from the type species in the shape of its acetabulum, position of testis, character of vitellarium and the position of the genital pore, besides differences in the measurements of the various organs.

The author is grateful to the Director and the Pathologist of the Imperial Veterinary Research Institute, Mukteswar, for their kind encouragement.

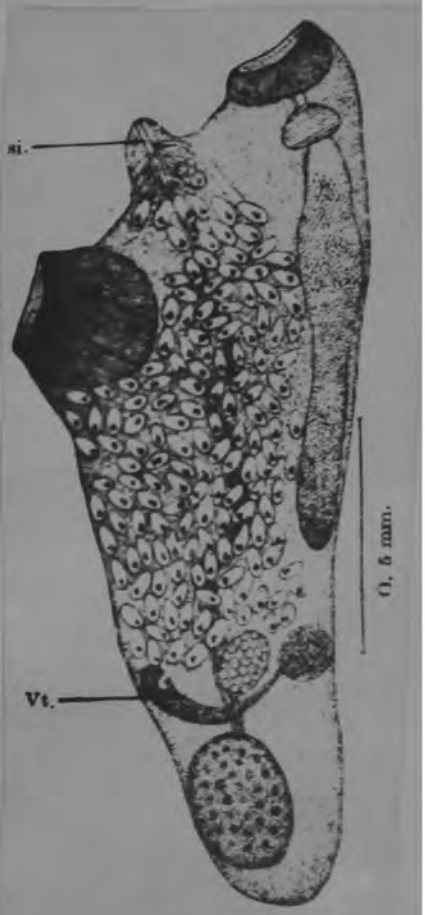


Fig. No. 2.
Haplosplanchnus purii

Haplosplanchnidae

Haplosplanchnus purii Srivastava,1939

Length: 1.5 to 2.3
Width : 0.54 to 1.2
Oral sucker: 0.08 to 0.22 by 0.25 to 0.34
Acetabulum (size): 0.22 to 0.34 by 0.24 to 0.38
(location) : 1/3 from anterior end

Esophagus: 0.12 to 0.18

Pharynx: 0.07 to 0.1 by 0.08 to 0.14

Genital pore: on a papilla midway between suckers

Testes (shape): single, ovoid
(location) : close to posterior end

Cirrus sac:
Ovary (shape):
(location): close in front of testis

Vitellaria: scythe-shaped.

Eggs: 49 to 68 by 23 to 34 μ
Other features: small spherical seminal receptacle

Host: Mugil waigiensis Quoy & Gaim

Locality: Bay of Bengal and Arabian Sea
Comparisons:

Reference: Jour- Indian Jour.Vet. Sci.,9:67-71

Life cycle:

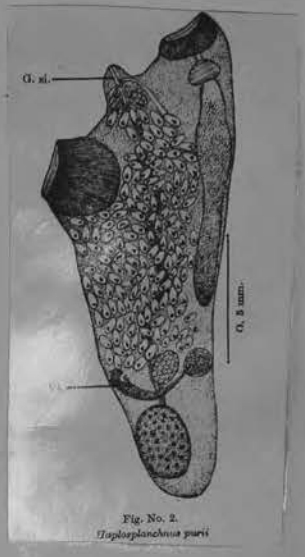


Fig. No. 2.
Haplosplanchnus purii

probably Haplosplanchidae

Larura caudatum Gen. et. sp. nov.[1] Srivastava, 1939

Host.—*Mugil waigiensis* Quoy and Gaim.

Habitat.—Intestine.

Locality.—Puri, Bay of Bengal.

Three specimens of this interesting trematode were collected from the gut of *Mugil waigiensis* examined at Puri in 1935. In the living state the parasite is light-brown in colour and does not appear to possess any marked power of contraction and expansion. It cannot remain alive outside the host for even a quarter of an hour. The trematode has a peculiar, plump, smooth body which is roughly Y-shaped with unequal arms and a broad stem with a semi-spiral end. In permanent mounts it measures 3·6 to 3·8* in length from the oral extremity to the hinder end and 1·2 to 1·4 from the genital pore to the acetabular end. The small, transversely oval, subterminal oral sucker, 0·2—0·24 × 0·28—0·35 in size, is followed by a small prepharynx, a dome-shaped pharynx 0·12×0·14—0·16 in size, and an oesophagus 0·32—0·5 long. Posteriorly the oesophagus is continued into a single straight caecum 0·4—0·8 × 0·14—0·16 in size. The acetabulum is a long club-shaped, tubular, muscular structure, 0·96—1·8 × 0·32—0·54 in size, situated in the longer arm of the Y-shaped body.

[1] The new genus is named in honour of Dr. George K. La-Rue, the well-known American helminthologist.

* All measurements are in mm.

A single oval testis, 0·44—0·54 × 0·32—0·4 in size, is situated a little behind the first half of the body length. The vesicula seminalis is a long, sinuous tube which opens at the level of the posterior end of the oesophagus into an elongated, oval pars prostatica surrounded by well-developed prostate glands. Terminally the pars prostatica opens into a tubular genital sinus. The genital pore lies at the bifurcation of the Y.

About a dozen specimens of this parasite were collected from the intestine of a food-fish obtained from the Bay of Bengal ard the Arabian Sea. The body is fleshy, smooth and roughly triangular with broadly rounded off ends. In permanent mounts the trematode measures 1·5—2·3 in length and 0·54—1·2 in maximum breadth which occurs across the acetabular region. The anteriorly directed, cup-shaped oral sucker measures 0·08—0·22 × 0·25—0·34 in size. It is followed by a small and narrow prepharynx, a dome-shaped pharynx, 0·07—0·1 × 0·08—0·14 in size and an oesophagus, 0·12—0·18 × 0·08—0·12 in size. The oesophagus is continued posteriorly into a long, broad, tubular caecum 0·5—0·9 in length. The acetabulum is bowl-shaped and muscular and measures 0·22—0·34 × 0·24—0·38 in size. It is situated at the junction of the first and second thirds of the body length.

The small, spherical ovary of 0·18—0·28 size lies obliquely in front of the testis. The size of the receptaculum seminis varies from 0·16 to 0·4×0·2 to 0·5, depending on the amount of its contents. Though its position is slightly variable, it is always pre-testicular. A small Laurer's canal is given off from the duct of the receptaculum seminis. A diffuse shell gland mass lies between the receptaculum seminis and the ovary. The vitellaria are poorly developed and consist of long follicles which are confined to the space between the testis, the ovary, the blind end of the intestinal caecum, and the right body wall. The intricately coiled uterus is confined to the space between the testis and the acetabulum. The eggs are numerous, operculate, 0·033—0·04 × 0·019—0·023 in size, and contain developing miracidia with prominent eye-spots. Terminally the uterus opens independently of the male opening.

The excretory bladder is Y-shaped with a short, median stem and long cornua.

from Indian J. Vet. Sci. 9: 67-70

HAPLOSPLANCHNUS

Haplosplanchnidae

Syn. LARUEA Srivastava, 1939

Srivastava's generic diagnosis of Laruea.

Medium sized, plump, smooth, Y-shaped body with unequal arms and semi-spiral posterior end. Oral sucker oval, subterminal; acetabulum long, tubular, club-shaped and muscular, situated in the longer arm of the Y-shaped body. Prepharynx small; pharynx small and dome-shaped; esophagus smaller than cecum; cecum single, straight, ending blindly in front of the middle third of the body length. Seminal vesicle tubular, sinuous; pars prostatica small, oval with well-developed glands and opens into a tubular genital sinus in the angle of the Y. Ovary small, spherical and ~~poorly-developed~~ pretesticular. Seminal receptacle and Laurer's canal present. Vitellaria poorly developed and confined to the space between testis, ovary, blind end of cecum and the right body wall. Uterus with numerous eggs with developinmiracidia having prominent eye-spots, confined between acetabulum and testis. Uterus opens into genital sinus independently of the male opening. Excretory bladder Y-shaped with small median stem and long cornua. Parasitic in marine fishes.

Type species: Laruea caudatum Srivastava, 1939

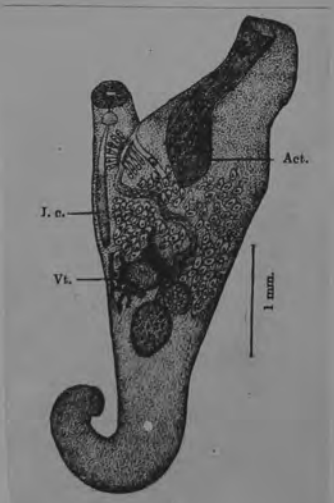


Fig. No. 1
Laruea caudatu.

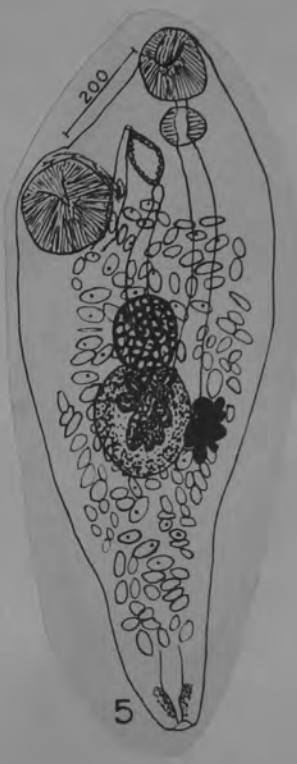
~~OVER~~ SEE BACK OF HAPLOSPLANCHNUS FOR II PAGE

Pischthal & Nasir, 1974

Haplosplanchnus venezuelensis sp. n. (~~Fig. 5~~)

Host: *Antennarius multiocellatus* (Cuv. & Val.) (Lophiiformes: Antennariidae).
Site: Small intestine.
Locality: Los Roques Islands.
Specimen deposited: No. 72874 (holotype).

Description (based on one adult worm in sinistral ventrolateral view): Haplosplanchnidae. Body elongate, 1,286 long by 465 wide at acetabular level, anterior extremity rounded, posterior truncated. Forebody 245 long; hindbody 850 long; forebody–hindbody length ratio 1:3.5. Eye spot pigment present. Many large gland cells between oral sucker and posterior margin of acetabulum, very few gland cells scattered posteriorly to testicular level. Oral sucker ventroterminal, 136 by 124. Acetabulum 191 by 194, on short peduncle. Sucker length ratio 1:1.40, width ratio 1:1.56. Prepharynx 27 long; pharynx 61 by 78; esophagus short; cecum extending to testicular level. Excretory bladder Y-shaped, stem reaching to testis, narrowing considerably and surrounded by mass of gland cells before opening at terminal pore, arms extending to pharyngeal level.



Testis single, smooth, 205 by 165, lying 180 postacetabular; posttesticular space 455 long. Seminal vesicle 310 long, commencing near testis. Prostatic vesicle ovoid, 97 by 53, surrounded by few prostate cells. Genital atrium tubular, very short. Genital pore at pharyngeal level. Ovary median, smooth, 114 by 100, lying 68 postacetabular, overlapping testis slightly. Seminal receptacle probably present but obscured by eggs. Vitelline follicles in two lateral, grapelike bunches at testicular level, right field 160 by 109, left 192 by 75. Uterus between acetabulum dorsum and posterior extremity, joining ejaculatory duct just anterior to prostatic vesicle. Eggs yellow-brown, older ones containing oculate miricidia; 10 oculate eggs measuring 58–65 (61.5) by 30–33 (31.2).

Discussion

Our new species appears closest to *H. mugilis* Nahhas & Cable 1964 from a mugiliform (Mugilidae) fish from Curaçao. The latter species differs from ours in having the testis about midway between the acetabulum and posterior extremity and the genital pore midway between the acetabulum and pharynx, and the vitellaria consisting of 10–12 inconspicuous, scattered follicles.

HAPLOSPLANCHUS

LOOSE LEAF
ORGANIZER

SCHEDULE

PERIOD OR TIME								
COURSE **MON.** INSTRUCTOR								
COURSE **TUE.** INSTRUCTOR								
COURSE **WED.** INSTRUCTOR								
COURSE **THU.** INSTRUCTOR								
COURSE **FRI.** INSTRUCTOR								
COURSE **SAT.** INSTRUCTOR								

NAME _____

ADDRESS _____

SCHOOL _____ TELEPHONE _____

Haplosplanchnidae

HAPLOSPLANCHNOIDES Nahhas & Cable,1964

The next species has haplosplanchnid characteristics but differs from known genera in having the ventral sucker so near the posterior end of the body that the gonads necessarily are preacetabular. In life, that sucker was nearer the posterior end of the body in our specimen than it appears in the whole mount (Fig. 14). Thus the Haplosplanchnidae is another example of families in which certain species evidently are secondarily amphistomatous. To receive the species, a new genus is erected and characterized as follows:

1964 Nahhas & Cable

Haplosplanchnoides n.g.

Diagnosis: Family Haplosplanchnidae. Body with thick unarmed cuticle. Oral sucker terminal; ventral sucker near posterior end of body. Prepharynx and pharynx present; cecum single, extending to posterior end of body. Testis single, anterior to acetabulum; cirrus sac absent; seminal vesicle long and tubular. Ovary anterior to testis; seminal receptacle present; uterus pretesticular. Genital pore in anterior half of body. Vitellaria extensive, from prepharyngeal level to posterior end of body. Eggs large. Parasites in intestine of marine fishes. Type and only species:

Type species: Haplosplanchnoides hemiramphi Nahhas & Cable,1964

Haplosplanchnoides hemiramphi n.g., n.sp Nahhas & Cable, 1964
Figure 14

Host: *Hemiramphus brasiliensis* (J).
Site: intestine.
Holotype: U.S.N.M. 60263.

Description based on a single specimen. Body elongated, rounded at both ends, 1.73 long by 0.720 wide. Oral sucker 0.233 long, 0.267 wide; ventral sucker near posterior end of body, 0.420 long, 0.313 deep; ratio of sucker lengths 1:1.7. Prepharynx short; pharynx 0.133 long, 0.160 wide; cecum long, terminating near posterior end of body. Testis entire, 0.188 by 0.210, near anterior margin of ventral sucker; seminal vesicle long, sinuous, extending from genital pore to testis; pars prostatica and prostate cells not seen, probably obscured by vitelline follicles; ejaculatory duct short. Ovary entire, 0.153 by 0.158, a short distance anterior to testis; seminal receptacle anterodorsal to ovary; uterus short. Genital pore probably median, about midway between ovary and pharynx. Vitelline follicles large, filling most of body between prepharynx and posterior end. Eggs few, 75-84 by 60-68 μ. Excretory vesicle not observed; pore dorsal, a short distance from posterior end of body.

Although certain other haplosplanchnids have short hindbodies, their gonads are never anterior to the acetabulum except perhaps in *Schikhobalotrema glomerosum* which Pritchard and Manter (1961) described from two specimens in poor condition.

HAPLOSPLANCHNOIDES

HAPLOSPLANCHNIDAE

Hymenocotta mulli, n. gen., n. sp. (Figs. 1-3) Manter, 1961

HOST: mullet.

LOCATION: intestine.

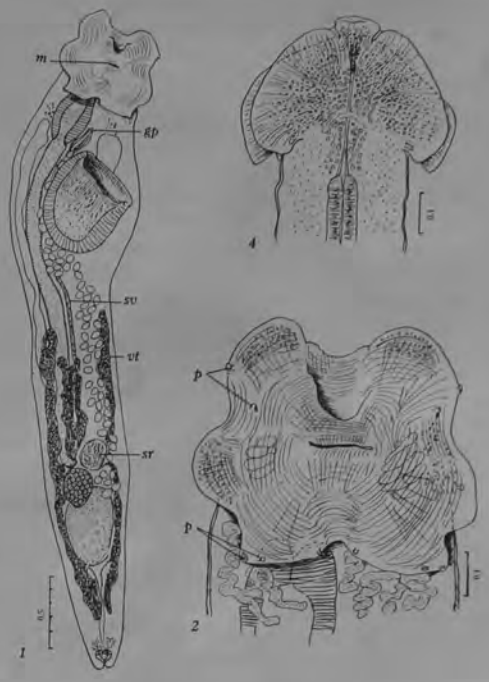
NUMBER: two specimens in a single host.

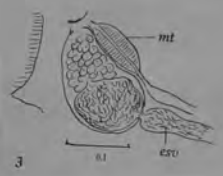
HOLOTYPE: U. S. Nat. Mus. Helminth. Coll. No. 39452.

DESCRIPTION (based on two specimens): Body elongate, 3.040 to 4.503 long; greatest width at acetabular level, 0.912 in the 4.503 specimen; forebody about $^1/_5$ body length, 0.608 to 0.874; hindbody gradually tapering almost to a point. Scattered pigment granules at level of pharynx. Oral sucker replaced by a broad membranous, muscular fold with six short, rounded lobes, one pair anterior, two pairs latero-posterior; posterior pair smaller and more or less pointed (Fig. 2). Six pairs of sensory papillae on lobes. Mouth a transverse slit. A cup-like depression in disc, just anterior to mouth. Greatest diameter of oral disc 0.603 to 0.684. Prepharynx covered by oral disc, about half as long as pharynx; pharynx 0.328 to 0.368 long by 0.201 to 0.247 wide. Single cecum reaching about $^2/_3$ body length, to anterior end of ovary. Testis in posterior fourth of body, elongate oval, 0.551 by 0.348 to 0.418; posttesticular space 0.589 to 0.684. Seminal vesicle tubular, long, almost straight, extending at least halfway from acetabulum to testis. Cirrus sac present (Fig. 3), ovoid to elongate, containing an internal seminal vesicle in its posterior half and prostatic cells in its anterior half; cirrus not evident. Genital atrium very short and non-muscular; genital pore opposite posterior half of pharynx. Ovary rounded, overlapping anterior end of testis. Seminal receptacle globular, thick-walled, almost as large as ovary, just anterior and to one side of ovary. Mehlis' gland dorsal to ovary. Vitellaria consisting of fused follicles forming broad tubes, a pair on each side of body and two or three shorter, median, preovarian tubes; anterior extent about midway between ovary and acetabulum or a little more; posterior extent midway between testis and posterior end of body. Uterus straight, between ovary and acetabulum; it narrows to a small tube dorsal to acetabulum then joins a short muscular metraterm (Fig. 3) which enters genital atrium near pore. Eggs large, very thin-shelled, almost as wide as long; uncollapsed eggs 92 to 128 by 80 to 88 microns; collapsed eggs about 88 by 68 microns. Excretory pore terminal; immediately preceding it a pair of small deeply stained, funnel-shaped structures of unknown significance; excretory tube near them surrounded by gland cells; excretory stem forking at posterior end of testis; a pair of swollen clear vessels extend into forebody to end at level of genital pore, probably arms of excretory vesicle but connection to median stem not observed. Small winding tubes filled with finely granular material occur in forebody. They have the appearance of lymphatic vessels (Fig. 2). Lymphatic vessels are not reported for this family.

The name *Hymenocotta* is from *hymen*, membrane and *kotta*, head; it refers to the distinctive membranous oral disc.

DIAGNOSIS OF HYMENOCOTTA: Haplosplanchnidae in which oral sucker is replaced by a 6-lobed oral disc with few radial muscles. Cirrus sac present, containing an internal seminal vesicle and prostatic gland cells but with weakly developed, or no, cirrus. Ovary globular, unlobed; seminal receptacle globular, large; vitelline follicles fused to form longitudinal tubes; eggs large, thin-shelled, with undeveloped miracidia. Type species: *H. mulli;* in mullet, Fiji Islands.





***Hymenocotta mulli* Manter, 1961**

HOSTS AND LOCALITIES: Mullet; Mugilidae; New Caledonia and Fiji. *Mugil cephalus* Linn., at Heron Island, Queensland, Australia.

LOCATION: Intestine.

From: Durio & Manter 1968

ex. Chirocentrus dorab (Forsk.)
(Chirocentridae)
Bay of Bengal
From: Hafeezullah, 1971

DISCUSSION: This peculiar trematode is clearly a haplosplanchnid but is very different from any other genus in the family by possessing a lobed muscular fold in place of an oral sucker, and in possessing a cirrus sac. Yamaguti (1958) recognizes three genera in the family. In *Haplosplanchnus* Looss, 1902 and the closely related *Laruea* Srivastava, 1939, the vitellaria are reduced to small remnants close to the ovary and the eggs contain miracidia with eye-spots. Both genera are parasites of *Mugil*. Most species in the family are in the genus *Schikhobalotrema* Skrjabin & Gushanskaja, 1955, and possess vitelline follicles of considerable extent; eggs do not contain developed miracidia; no species is as yet known from mullets.

Hymenocotta agrees with *Schikhobalotrema* in its extensive vitellaria and undeveloped miracidia but is entirely different in its oral disc and presence of a cirrus sac. Its host is like that of *Haplosplanchnus* and *Laruea*.

An interesting circumstance is the similarity in the evolution of the Haplosplanchnidae and the Haploporidae, both of which are common parasites of mullets. Manter (1957, p. 191) noted that the genera of Haploporidae may be divided into two groups: seven genera have greatly reduced vitellaria and eggs containing oculate miracidia; ten genera have follicular vitellaria (often rather tubular) and eggs containing undeveloped miracidia. Still more remarkable is the fact that genera in the former group are mostly parasites of *Mugil;* while the latter group occurs in Chaetodontidae, Sparisomidae, Scaridae, Acanthuridae, Scorpidae, and Girellidae. The Haplosplanchnidae not only parallel this grouping in regard to reduced vitellaria and fully developed miracidia, but also parallel it very closely in type of hosts. Haplosplanchnid genera with reduced vitellaria are exclusively parasites of *Mugil*. All such haploporid genera are also parasites of *Mugil* except for three species reported from Anostomidae in Argentina (Szidat, 1954). Furthermore, the hosts of genera with extensive vitellaria in both families are remarkably similar. Thus, four of the six families mentioned above are also hosts for the corresponding group of haploporid genera. The parallelism extends even to the very small family of fishes, the Girellidae.

The peculiar anterior end of *Hymenocotta* recalls comparisons of haplosplanchnids with the Aspidogastridae. Looss (1902) believed the haplosplanchnids connected the aspidogastrids with the "true" distomes. This view has not been generally accepted. An exception has been Chauhan (1954) who separated the Haplosplanchnidae in a separate suborder, the Preprosostomata. What little is known of life cycles does not support this view. At least some aspidogastrids do not reproduce as larvae, the adult developing directly from the miracidium; and Cable (1954) has shown that *S. acutum* (=*Haplosplanchnus acutus*) has a digenetic life cycle; its cercariae develop in sporocysts in marine snails. However, it must be admitted that the adult haplosplanchnid has many characters suggestive of aspidogastrids, e.g. single cecum, single testis, long tubular seminal vesicle, and Y-shaped excretory vesicle. The cirrus sac and metraterm of *Hymenocotta* are similar to those of *Lobatostoma*. The replacement of a typical oral sucker by a lobed disc is an added similarity. However, a comparison of this disc with the lobes of *Lobatostoma* (Figs. 2 & 4) shows that the former has a variety of muscle including some which are more or less circular, whereas those in *Lobatostoma* are mostly radial. It seems doubtful if these structures are homologous. At the same time, the numerous similarities of the two groups of trematodes are difficult to explain on an ecological basis. It will be interesting to know if the life cycle of *Lobatostoma* is actually direct.

Hymenocotta **manteri** sp. n.
Figures 12 and 13
Overstreet, 1969

Host: *Mugil cephalus* (3 of 3), type host.
Site: Intestine and pyloric caeca.
Holotype: U. S. N. M. Helm. Coll. No. 71300, paratype: No. 71366.

Description: (based on 16 wholemounts and 3 sectioned specimens): Body elongate, 0.9 to 1.6 long by 0.27 to 0.45 at maximum width, usually near acetabular level. Cuticle thick, with prominent rings, especially in tapering hindbody. Pigment granules scattered in forebody and occasionally throughout entire worm. Oral sucker replaced by oral disc which may be flared out, or contracted (Figure 13) and superficially resembling spherical or cup-shaped oral sucker; 0.15 to 0.33 wide at greatest diameter, depending on individual variation and contraction. Numerous sensory papillae on disc. Acetabulum protrusible, without lobes, 0.16 to 0.25 long by 0.17 to 0.27 wide; aperture a circular to longitudinal slit-like opening. Sucker ratio 1:0.6 to 1.3. Forebody 26 to 36% of body length. Prepharynx about ½ length of pharynx. Pharynx 0.07 to 0.10 long by 0.06 to 0.09 wide. Single caecum usually approaching or extending well into testicular level; highly cellular, often containing particulate matter.

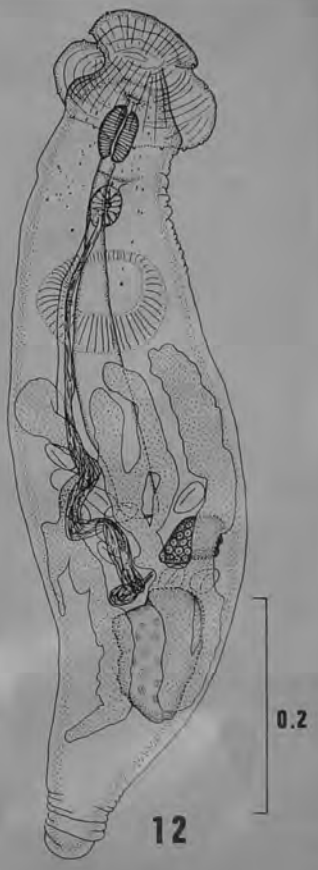
Testis elongate, spherical, or slightly irregular, not touching acetabulum; 0.13 to 0.19 long by 0.09 to 0.20 wide. Posttesticular space 11 to 39% of body length, depending on contraction. Cirrus sac absent. Seminal vesicle tubular, long, extending near or well into testicular level; straight to highly sinuous; often with several loops directly anterior or posterior to acetabulum; connected to spherical prostatic vesicle by pars prostatica of greater length than vesicle. Genital atrium muscular. Genital pore median or submedian, at a level near posterior of pharynx.

Ovary subglobular, 0.06 to 0.12 long by 0.05 to 0.12 wide, variable in position from anterior acetabular level to posterior border of testis, usually anterolateral to testis. Seminal receptacle dorsal, near ovarian level. Vitelline follicles usually in elongate groups, extending from level of acetabulum or slightly posteriorly to a level midway between testis and posterior end of body. Uterus may extend to midtesticular level before turning anteriorly. Metraterm present. Eggs usually partially collapsed, 66 to 89 by 35 to 48 microns; not containing fully-developed miracidia.

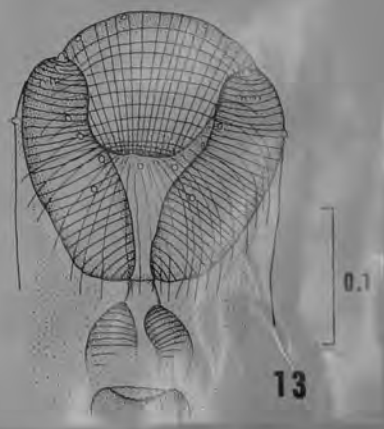
Excretory pore terminal; vesicle bifurcating at midtesticular level with arms extending to near posterior border of pharynx.

Discussion: Manter (1961:67-69) erected the genus *Hymenocotta* to accommodate a single species, *H. mulli* Manter, 1961, which differs from all other haplosplanchnids in having a cirrus sac and a six-lobed disc, which replaces the oral sucker. The present species is the second with a disc, but it is not six-lobed, and a cirrus sac is absent. What appears to be the cirrus sac is weakly developed and not evident in all of Dr. Manter's specimens of *H. mulli* from New Caledonia (Manter, 1968:personal communication). Pending further information, the present species is placed in *Hymenocotta* because of the oral disc which, with the absence of a well-developed bulb of prostatic ducts, distinguishes *H. manteri* from *Schikhobalotrema elongatum* Nahhas and Cable, 1964, an otherwise similar species from the same host.

This species is named in honor of Dr. Harold Winfred Manter, in recognition of his contributions to the field of trematodology.



12



13

-over-

Hymenocotta manteri Overstreet, 1969

(Figs. 2–5)

Redescription (based on 19 mature mounted specimens from Louisiana and Mississippi and living material from same areas): Body 1,047 to 1,835 long by 208 to 421 wide. Oral disc not lobed, 141 to 198 wide. Acetabulum 145 to 259 long, 152 to 259 wide, 102 to 198 deep (depth based on 4 noneverted suckers). Sucker width ratio 1:1.0 to 1.4. Forebody 14 to 24% of body length. Papillae numerous on oral disc, acetabulum, and forebody; an extra large contractile papilla on ventral lip of oral disc. Gland cells numerous in lateral bunches anterior to acetabulum; larger more granular cells near and posterior to rear border of acetabulum; ducts from both sets of glands leading anteriorly and opening at large papilla on oral disc. Prepharynx 17 to 40 long. Pharynx 51 to 81 long by 42 to 72 wide. Cecum terminating in hindbody between preovarian and posttesticular levels. Testis 182 to 370 long by 86 to 194 wide. Posttesticular space 7 to 31% of body length. Cirrus sac present; containing muscular duct often swollen and appearing as internal seminal vesicle and separate prostatic vesicle. Seminal vesicle extending to near seminal receptacle, usually near ovarian level. Genital atrium short. Ovary 65 to 182 long by 58 to 126 wide. Vitellaria occasionally extending from preacetabular region to posterior end of body. Eggs 74 to 91 long by 46 to 58 wide in mounted specimens, 77 to 95 by 47 to 61 in living ones. Excretory vesicle usually bifurcating in posttesticular space, occasionally as far anteriorly as midtesticular level.

Site: Intestine *Mugil cephalus*

Localities: Artificial ponds and Price Lake in Rockefeller Wildlife Refuge, Grand Chenier, Louisiana, and waters of and adjacent to Mississippi Sound, Mississippi.

Specimen deposited: USNM Helm. Coll. No. 71960.

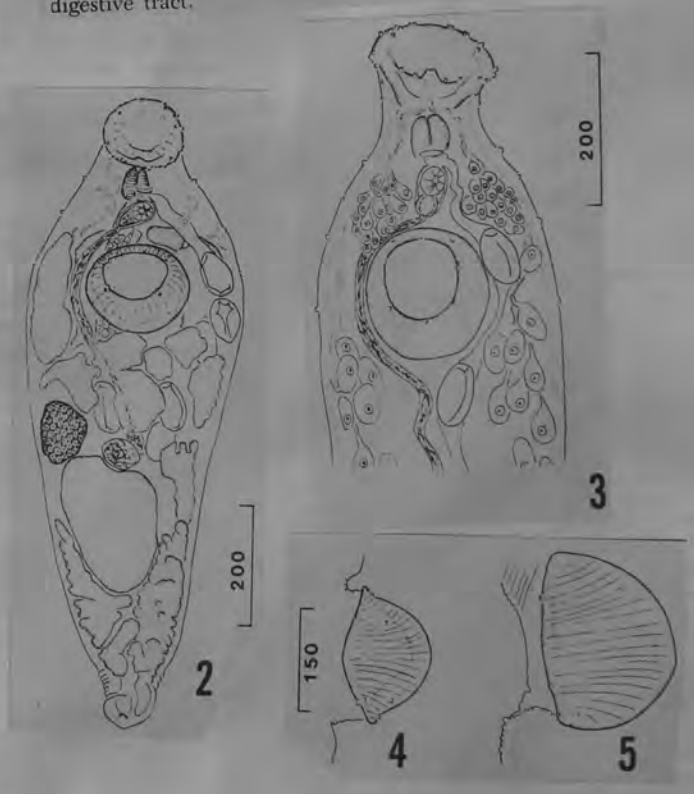
DISCUSSION

The data above reveal that more variation in the morphology exists than originally described, most of which could be expected. The major differences between the present specimens and those from Biscayne Bay, Florida, the only other locality recorded, are the more uniform cuplike appearance of the oral disc and the presence of a cirrus sac, a character of major importance in many trematode groups. Manter noted an inability to observe the sac in all specimens of *Hymenocotta mulli* Manter, 1961 (see Overstreet, 1969). I believe the forms from Florida and the Gulf of Mexico to be conspecific and the presence of the cirrus sac to further substantiate the position of *H. manteri* in the genus *Hymenocotta* Manter, 1961, which was erected to accept a species with an oral disc and a cirrus sac. Life history information or additional Atlantic material may indicate that worms from the two areas are valid subspecies or even different species.

Schikhobalotrema elongatum Nahhas and Cable, 1964, from *Mugil cephalus* at Curaçao is similar to *H. manteri* in most respects but quickly distinguished from it by the presence of tubules filled with a granular substance and associated with the terminal genitalia (Fig. 1). A similar system present in *S. acutum* (Linton, 1910) and illustrated by Overstreet (1969) can be used to separate *S. acutum* from *S. adacutum* (Manter, 1937) in which it is absent. Five specimens of *S. adacutum* collected from *Halichoeres bivittatus* (Bloch), the type host, in Biscayne Bay, Florida, by Mr. Martin Coman and myself compare favorably with the original description in most respects. They measured 0.52 to 0.77 mm long with a sucker width ratio of 1:1.4 to 1.7. The acetabular lobes were conspicuous, but in most specimens the posttesticular space was longer than that between the testis and acetabulum, the forebody was longer than one-half the length of the hindbody, and the vitellaria extended anterior to the acetabulum.

From Overstreet 1971
J. Parasit. 57

The system where products of two sets of glands are released externally at an oral papilla is also conspicuous in *S. acutum*. It is present but not as conspicuous in my specimens of *S. adacutum*, *S. kyphosi* (Manter, 1947), and *S. sparisomae* (Manter, 1937) and probably occurs in others. I could not distinguish it in Dr. Cable's loaned specimens of *S. elongatum*, but Nahhas and Cable (1964) described a similar arrangement in *S. heterocotylum* Nahhas and Cable, 1964. Pritchard and Manter (1961) and Yamaguti (1970) reported similar gland cells in species of *Schikhobalotrema* from Hawaiian fishes to be associated by ducts with the upper digestive tract.



FIGURES 2–5. *Hymenocotta manteri*. 2. Ventral view. 3. Anterior end showing terminal genitalia and gland cells with their ducts, ventral view. 4. Protruded acetabulum, right side view. 5. Acetabulum, not protruded, left side view.

HYMENOCOTTA

Schikhobalotrema Skrjabin et Guschanskaja, 1955

Generic diagnosis. — Haplosplanchnidae: Body smooth, with glandular cells in neck region. Oral sucker subterminal. Prepharynx usually present. Ceca single. Acetabulum equatorial or pre-equatorial. Testes single, median, in posterior half of body. Seminal vesicle tubular, long; pars prostatica present, sometimes vesicular; prostatic cells weakly developed. Genital pore median, anterior to acetabulum. Ovary pretesticular, rarely lobed. Vitelline follicles large, extending on each side of body from level of pharynx or acetabulum to posterior extremity. Uterus comparatively weakly developed; eggs usually large. Excretory pore dorsoterminal; arms terminating near anterior extremity. Intestinal parasites of fishes.

Genotype: ***S. acutum*** (Linton, 1910) S. et G., 1955 (Pl. 106, Fig. 1301), syn. ***Deradena acuta*** Linton, 1910, in *Tylosurus* spp.; U.S.A. Cercaria develops in *Cerithium variabile*, encysts in the open; stages of development from encysted metacercariae to adults were observed in natural infections of *Hyporhampus unifasciatus*, and adults were recovered from *Strongylura* sp. — Cable (1954).

Other species:

S. adacutum (Manter, 1937) S. et G. 1955, syn. *Haplosplanchnus a.* M., in *Halichoeres maculipinnis, H. bivittatus, Abudefduf marginatus;* Florida.

S. brachyurus (Manter, 1937) S. et G., 1955, in *Cryptomus auropunctatus, Pseudoscarus guacamaia, P. coelestinus, Sparisoma aurofrenatum, S. spinidens, S. viride;* Florida.

S. girellae (Manter et Van Cleave, 1951) S. et G., 1955, in *Girella nigricans;* California.

S. kyphosi (Manter, 1947) S. et G. 1955, in *Kyphosus sectatrix;* Florida.

S. obtusum (Linton, 1910) S. et G., 1955, in *Acanthurus hepatus, A. caeruleus;* Florida.

S. pomacentri (Manter, 1937) S. et G., 1955, *Pomacentrus leucostictus* and *P. xanthurus;* Florida.

S. sparisomae (Manter, 1937) S. et G., 1955, in *Sparisoma flavescens* and *S. viride;* Florida. Also in *Pseudoscarus perrico;* Mexico (Pacific).

Key to species of *Schikhobalotrema* from Hawaiian fishes

1. Testis nearer to posterior extremity than to anterior 2
   Testis dorsal or posterodorsal to acetabulum 3
2. Testis far posterior to acetabulum; seminal vesicle very long;
   body 1.2-1.8 mm long; eggs 72-82 × 42-58 μ in life . . . . . *S. acanthuri*
   Testis some distance posterior to acetabulum; seminal vesicle long;
   body 1.2-2.7 mm long; eggs (collapsed) 64-98 × 30-56 μ,
   74-82 × 48-60 μ in life . . . . . *S. robustum*
3. Body 1.6-19 mm long; eggs (collapsed) 75-94 × 40-48 μ . . . . . *S. crassum**
   Body 0.8-1.4 mm long; eggs (collapsed) 70-104 × 32-58 μ,
   63-75 × 46-52 μ in life . . . . . *S. hawaiiense*
   Body 0.7-0.8 mm long; eggs (collapsed) 83-107 × 43-59 μ . . . . . *S. glomerosum**

Yam., 1970

Reprinted without change of pagination from
PROCEEDINGS OF THE HELMINTHOLOGICAL SOCIETY OF WASHINGTON
Vol. 28, No. 2, July 1961

Studies on Digenetic Trematodes of Hawaiian Fishes: Family Haplosplanchnidae*

MARY HANSON PRITCHARD and H. W. MANTER

The haplosplanchnids have a single intestinal cecum, a single testis, a Y-shaped excretory vesicle, and lack a cirrus or cirrus sac. Eggs in the uterus may or may not contain occulate miracidia; but if they do, the condition is correlated with greatly reduced vitellaria and presence in a *Mugil* sp. host, as noted by Manter (1957).

Skrjabin and Guschanskaja (1955) restricted the genus *Haplosplanchnus* Looss, 1902 to the latter group of species and named for it the subfamily Haplosplanchninae. Their key stressed not only the weakly developed vitellaria but the presence of a ventral peduncle and a vas deferens functioning as a seminal vesicle. The majority of the species were placed in *Schikhobalotrema* Skr. & Gusch., 1955, subfamily Schikhobalotrematinae (well developed vitellaria, no peduncle, and a well developed seminal vesicle).

The same authors considered *Laruea* Srivastava, 1939 a synonym of *Haplosplanchnus*. The peduncle is apparently larger than in *H. pachysomus* (Eysenhardt, 1829) Looss, 1902 and the posterior end of the body is described as "semi-spiral," but the large peduncle as well as the long posttesticular space appear to us to be specific characters. Although Yamaguti (1958) retains the genus *Laruea*, we agree with Skrjabin and Guschanskaja and consider it a synonym of *Haplosplanchnus*.

If two subfamilies are to be recognized here, the distinguishing characters should be embryonated or nonembryonated uterine eggs, the extent of the vitellaria, and, perhaps, the host (mullet or non-mullet). Certainly the peduncle of *H. purii* Srivastava, 1939 is little or no more prominent than those that may be found among the Schikhobalotrematinae, while the development of the seminal vesicle varies in both subfamilies. Vitellaria are definitely more extensive in *Schikhobalotrema*, at least extending backward beyond the testis and usually, but not necessarily, anterior to the acetabulum. The eggs of *Schikhobalotrema* contain very young embryos without eyespots even near the genital pore. This condition is in contrast with the oculate miracidia which occur throughout the uterus in the species of *Haplosplanchnus*. These seem to us to be more generic than subfamily characteristics.

Schikhobalotrema acutum (Linton,1910) Skrjabin & Guschanskaja,1955

from Overstreet,1969:

Schikhobalotrema acutum (Linton, 1910) Skrjabin and Guschanskaja, 1955
Figure 11

Deradena acuta Linton, 1910.
Haplosplanchnus acutus (Linton, 1910) Manter, 1937.

Host: *Strongylura timucu* (1 of 3).
Site: Rectum.

Discussion: Sogandares-Bernal and Sogandares (1961:145-147) reviewed this species and considered *Schikhobalotrema* as a subgenus of *Haplosplanchnus*. There is considerable range in length, an important character used to distinguish this species from *S. adacutus*. The previous authors reported a specimen of 0.6, without eggs, from *Abudefduf saxatilis* (= *A. marginatus* as used by Manter, 1937), a host of the smaller *S. adacutus*. Siddiqi and Cable (1960:Figure 16) illustrated a specimen of 0.7 from a beloniform, the typical host for *S. acutum*. Manter (1937b:385) discussed specimens of 1.3 to 2.0 long and Caballero *et al.* (1953: 128) others 1.6 to 2.1 from the Pacific Ocean, all from beloniform fishes. My specimens are 2.1 to 2.5 with sucker ratios of 1:1.2 to 1.4 and have eggs 85 to 88 by 53 to 57 microns. Sensory papillae are present around the oral sucker. Manter (1937b: 386) described longitudinal striae dividing the muscular genital bulb. The dorsal portion of this bulb in my specimens appears corrugated and the ventral portion is covered by a series of tubules which are filled with granules (Figure 11). The tubules extend posteriorly, dividing into two groups at the midlevel of the bulb. Both groups lead to large reservoirs of granules, which appear like yolk granules, located on each side of the acetabulum.

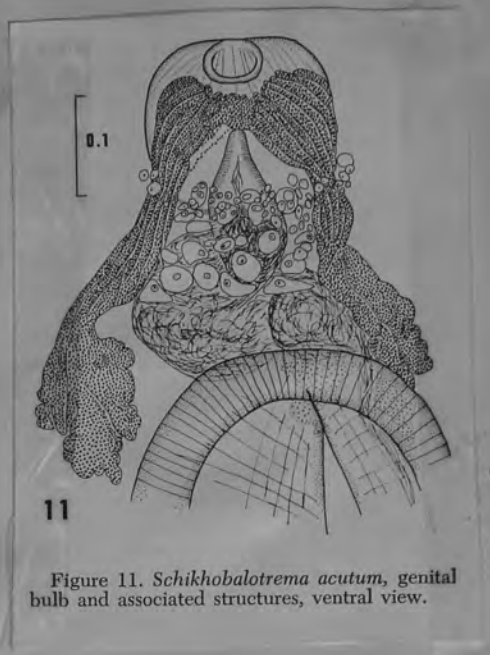


Figure 11. *Schikhobalotrema acutum*, genital bulb and associated structures, ventral view.

over

3. *Schikhobalotrema acutum* (Linton 1910) Skrjabin & Guschanskaja 1955 (Haplosplanchnidae): three adult worms from the small intestine of *Lutjanus analis* (Cuv.) at Los Roques Islands and two from *Trichiurus lepturus* (L.) (Perciformes: Trichiuridae) at Los Testigos Islands. Specimens deposited: No. 72883 (from *L. analis*); No. 72884 (from *T. lepturus*).

Venezuela; From
Fischthal + Nasir, 1974

Haplosplanchnidae

Haplosplanchnus acutus (Linton, 1910) Manter, 1937

HAPLOSPLANCHNUS ACUTUS (LINTON)

(Fig. 6)

Synonyms: Distomum sp. of Linton, 1907: 115, fig. 62
Deradena acuta Linton, 1910

Hosts:

Tylosurus raphidoma (Ranz). Present in 4 of 10 examined. Recorded by Linton from Tylosurus acus at Bermuda and. Tylosurus marinus at Tortugas.

Specific diagnosis: Body elongate, cylindrical, length 1,267 to 1,485 (Linton's specimens were 1,50 and 1,96 mm); width 0,405 to 0,525 mm. Oral sucker sub-terminal, 0,150 to 0,172 mm in diameter, mouth ventral with well developed posterior marginal projection. Ventral sucker anterior to midbody, longer than wide, length 0,262 to 0,337 mm, width about $1^1/_2$ to twice that of oral sucker. Aperture of ventral sucker a longitudinal slit. A pair of well developed finger-like lateral lobes or processes on each side of the posterior end of the aperture. They point backwards. Hindbody usually considerably and always at least somewhat longer than forebody. Short but definite prepharynx; pharynx 76 to 93 μ in length, 70 to 87 μ in width; short esophagus; single cecum overlapping testis dorsally and may extend to midtestis. Genital pore median or submedian opposite posterior end of pharynx. Single testis elongate, post-testicular distance less than distance from testis to ventral sucker. Seminal vesicle a long tube, straight except for a few bends in its anterior fourth. Prostatic cells lacking or weakly developed. Genital atrium consisting of a large conspicuous bulb divided by longitudinal striae. This muscular bulb is as large as or usually evidently larger than the pharynx. Ovary globular, unlobed, between testis and ventral sucker. Seminal receptacle spherical at dorsal posterior border of ovary. Vitellaria of large follicles tending to fuse longitudinally, extending forward either to middle of ventral sucker or to the anterior edge of this sucker. Eggs 73 to 85 by 51 to 56 μ (Linton's measurement from a living specimen: 71 by 54 μ.) Excretory vesicle forking opposite the posterior portion of the testis. Type host: Tylosurus acus at Bermuda. Other hosts: Tylosurus raphidoma, T. marinus at Torutgas.

Discussion. This species differs from all preceding species of Haplosplanchnus in the longitudinal slit-like aperture of the ventral sucker and the pair of flap-like lateral processes at its posterior end. These characters may prove to be of generic value. The genital bulb is much better developed in H. acutus and the eggs are slightly smaller than in preceding species from Tortugas.

What seems to be the same species has been collected by the author from Tylosurus fodiator Jordan a. Gilbert from the Pacific Ocean at Port Utria, Colombia. It may prove to be a characteristic and widely distributed parasite of Tylosurus.

The lobe-like processes of the ventral sucker are unique. They were apparently over looked by Linton and no observations on their living state are available. They seem to be flexible, perhaps contractile. Since they do not seem to be strong enough to aid in attachment they may serve as sense organs.

Fig. 6. H. acutus (Linton) from Tylosurus raphidoma. Semi-ventral view.

I. *Family HAPLOSPLANCHNIDAE Poche, 1925*

Haplosplanchnus acutus (Linton, 1910) Manter, 1937

Hosts.—*Thyrinops pachylepis* (Gunther) [new host record]; *Tylosurus raphidoma* (Ranzani), needle fish.

Location.—Intestine, next to pyloric junction.

Locality.—*T. pachylepis* from Bella Vista Beach, Panama City, Panama Pacific; and T. raphidoma off Lerner Lab N. Bimini, B.W.I.

Manter, 1937

Schikhobalotrema acuta (Linton, 1910) Skrjabin and Guschanskaja, 1955
(FIGURE 16)

Synonyms:
Deradena acuta Linton, 1910.
Haplosplanchnus acutus (Linton) Manter, 1937.
Hosts: *Strongylura* sp., **Hyporhamphus unifasciatus*.
Site: intestine.
Locality: Punta Arenas, P. R.
Deposited specimen: No. 39314.

Our material differs from Manter's description in a few minor details of measurement and relative position of ovary and seminal receptacle. The egg size is slightly smaller.

The species for which Cable (1954*a*) determined the life history probably was *S. acuta*. On the basis of that study, La Rue (1957) considers the Haplosplanchnidae to be closely related to the echinostomes and fasciolids.

From Siddiqi & Cable, 1960

Reported from
Strongylura ardeola } Curaçao
S. timucu

S. raphidoma - Jamaica
by Nahhas & Cable, 1964

Schikhobalotrema acutum (Linton, 1910) Skrjabin and Guschanskaja, 1955**
Synonyms: Deradena acuta Linton, 1910, *Haplosplanchnus acutus* (Linton) Manter, 1937
Host: Strongylura marina
Site: intestine
Locality: Alligator Harbor
Deposited specimen: U.S.N.M. No. 60081

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

Haplosplanchnus (Schikhobalotrema) acutus
(Linton, 1910) Manter, 1937
(fig. 16)

Host.—*Abudefduf saxatilis* (Linn.); sergeant-major; new host record; family Pomacentridae.

Incidence of infection.—In 1 of 1 host.

Location.—Intestine.

Locality.—Galeta Point, Republic of Panama [new locality record].

Discussion.—Sogandares (1959) pointed out that *H. acutus* is a parasite of needlefishes (family Belonidae) and reviewed the occurrence of this species in different hosts and localities. The record of *H. acutus* by Manter (1940c) from *Kyphosus elegans* (Peters) in the Galapagos Islands, by Sogandares (1959) from *Thyrinops pachylepis* (Günther) in Panama Bay, and from *Abudefduf saxatilis* in the Panama Atlantic probably represent accidental infections since only one specimen was found in each case.

Our specimen from *A. saxatilis* had no eggs in the uterus, though it agreed in all details with material of the same species from Bimini, Bahamas and Panama Bay.

The Russian workers Skrjabin and Guschanskaja (1955) named the genus *Schikhobalotrema* for *Haplosplanchnus acutus* (Linton, 1910) Manter, 1937, and synonymized *Laruea* Srivastava, 1939 with *Haplosplanchnus* Looss, 1902. Manter (1957) independently arrived at the same conclusions utilizing somewhat different criteria from those of Skrjabin and Guschanskaja (1955). Yamaguti (1958) recognized *Schikhobalotrema*, but regarded *Laruea* a valid genus. Siddiqi and Cable 1960 recognized *Schikhobalotrema* with some reservations even though they named two new species and reported three others in this genus. These authors stated that, while they accepted Skrjabin's and Guschanskaja's arrangement, it would not be surprising to find intermediate species which would invalidate *Schikhobalotrema*. Skrjabin and Guschanskaja (1955) believed that *Schikhobalotrema* could be separated from *Haplosplanchnus* on the basis of the anterior reduction of the vitellaria, presence of a ventral acetabular peduncle, and a poorly developed seminal vesicle in the latter genus. Manter's (1957) views were that *Haplosplanchnus pachysomus* (Eysenhardt, 1829) Looss, 1902 (type species), *H. purii* Srivastava, 1939, and *H. caudatum* (Srivastava, 1939) Skrjabin and Guschanskaja, 1955 (= *Laruea caudata*), all occur in mullets (genus *Mugil* Linn.), possess uterine eggs with occulate miracidia, and have greatly reduced vitellaria. He also suggested that the other species of *Haplosplanchnus*, forms occurring in acanthurid, spariosomid (=family Scaridae), scarid and girellid fishes, with extensive follicular vitellaria, "(which tend to become tubular as happens in the Haploporidae)", and have uterine eggs with undeveloped embryos, should probably be placed in a separate genus. He did not name a new genus for these forms. Manter (1957) was unaware of Skrjabin and Guschanskaja (1955) because at that time political boundaries precluded free exchange of scientific information between Russian and American scientists. The fact remains that the different authors arrived at the same conclusions independently and through the use of different criteria. We have examined many live and preserved specimens of *H. acutus*, (type species of *Schikhobalotrema*), from needlefishes in Bimini, Bahamas. The vitellaria of *H. acutus* are frequently diffuse and poorly developed anteriorly. While there is a tendency for the vitellaria to become tubular in some species of *Haplosplanchnus*, as Manter (1957) suggests, the species of this genus show various degrees of intergradation of this character. We do not believe that the developmental rate of uterine eggs with occulate miracidia should have generic value, at least until we know if fully developed and passed eggs of *H. acutus* also possess occulare miracidia. The fact that the species with occulate miracidia in the uterine eggs coincidentally occur in *Mugil* spp. may indeed be suggestive that these species are closely related, yet not necessarily generically distinct from other species in which the miracidia in the uterine eggs have not developed completely. The only life history study in the Haplosplanchnidae is that of *H. acutus* by Cable (1954) and he was unable to observe (or at least did not report) fully embryonated eggs of this species. The length of the acetabular peduncle and poorly developed seminal vesicle are characters which vary in degree only, thus could hardly be considered generic. Another view is that the overlap of certain characters between the species of *Schikhobalotrema* and *Haplosplanchnus* gives further evidence of the closeness of relationship between the two genera. The question remains at present a matter of opinion.

Precluding a knowledge of life histories, when closely allied species groups of adult trematodes show morphological intergradation allowing partial but not complete segregation of these groups (clear-cut characters found in only one species group), we prefer to regard these species groups as subgenera. A moderate approach in naming genera eliminates the need of hastily erecting higher categories (often with insufficient evidence) such as subfamilies which may later tend to confuse the issue. Subgenera have permanent status in nomenclature and show relationships of the species groups without the necessity of creating higher categories.

We presently recognize the following disposition of the species of *Haplosplanchnus*: (1) subgenus *Haplosplanchnus*, *H.* (*H.*) *pachysomus* (Eysenhardt, 1829) Looss, 1902, *H.* (*H.*) *purii* Srivastava, 1939; (2) subgenus *Laruea*, *H.* (*L.*) *caudatum* Srivastava, 1939; and (3) subgenus *Schikhobalotrema*, *H.* (*S.*) *acutus* (Linton, 1910) Manter, 1937, *H.* (*S.*) *adacutum* Manter, 1937, *H.* (*S.*) *brachyurus* Manter, 1937, *H.* (*S.*) *girellae* Manter and Van Cleave, 1951, *H.* (*S.*) *kyphosi* Manter, 1947, *H.* (*S.*) *obtusum* (Linton, 1910) Manter, 1937, *H.* (*S.*) *pomacentri* Manter, 1937, and *H.* (*S.*) *spariosomae* Manter, 1937.

As Manter (1957) suggested, the haploporids may be related with the haplosplanchnids. Adult specimens of both families sometimes possess sensory papillae on the oral suckers, and except for the presence of a single cecum in *Haplosplanchnus* and a hermaphroditic sac in *Haploporus* Looss, 1902, are similar. We do not know the significance of the similarities between these families. The similarities may represent convergence which is frequently encountered in the Digenea.

26. *Schikhobalotrema acanthuri* ~~n. sp.~~ Yam., 1970

(Fig. 26)

HABITAT: Intestine of *Acanthurus sandvicensis* (type host), *Acanthurus nigrofuscus*, and *Zebrasoma flavescens*; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63556.

DESCRIPTION (based on four whole mounts): Body fusiform, 1.2-1.8 mm long by 0.35-0.5 mm wide at postacetabular level, more attenuated posteriorly than anteriorly, scattered anteriorly, especially dorsally, with numerous cuticular papillae. Oral sucker with wide ventroterminal opening, 0.11-0.18 mm in diameter; prepharynx more distinct in paratype than in holotype; pharynx 50-90 × 60-70 μ; esophagus 70-100 μ; intestine wide, lined with well developed cuboidal epithelia, 0.4 mm long, terminating 0.16 mm anterior to ovary in the type. Of the parenchymatous gland cells, the smaller ones are massed together posterolateral to the oral sucker and send their ducts convergently toward the anterior end of the prepharynx as well as toward the posterior end of the pharynx, but the larger ones lying in the shoulder region and containing coarser granules and large vesicular nuclei are associated with the esophagus and the anterior part of the intestine. Acetabulum 0.12-0.22 mm in diameter, with comparatively large opening, situated at posterior end of anterior third of body.

Testis oval, 0.2-0.35 × 0.13-0.25 mm, confined entirely to caudal third of body. Seminal vesicle tubular, up to 40 μ wide, undulating, 0.65-0.75 mm long, reaching as far back as ovary. No pars prostatica differentiated, although the terminal portion of the seminal vesicle is surrounded by prostate cells; ejaculatory duct represented by tapering end of seminal vesicle, opening into base of genital atrium along with metraterm. Genital atrium lined with cuticle, with its funnel-shaped opening just to right of middle of esophagus in the type.

Ovary subglobular, 60-120 × 80-120 μ, at junction of middle with posterior third of body and separated (60-90 μ) from testis by a space occupied by a narrow strand of vitelline follicles, vitelline reservoir, and right vas efferens. Seminal receptacle tubular, curved, to right of median line between ovary and testis. No Laurer's canal. Uterus extending forward almost straight to right of seminal vesicle in the type. Metraterm well developed, opening together with male duct at base of genital atrium. Eggs few, oval, 72-82 × 42-58 μ in life. Vitelline follicles relatively small, extending in lateral fields from level of pharynx in the paratype, but from level of anterior end of acetabulum in the type, to extreme posterior end of body, more or less interrupted opposite testis, occupying whole posttesticular area; vitelline reservoir intercalated between ovary and testis. Excretory vesicle tubular, reaching to posterior end of testis; main collecting vessels running forward to oral sucker in lateral fields.

DISCUSSION: This species resembles *Schikhobalotrema obtusum* (Linton, 1910) Siddiqi and Cable, 1960, but differs from it in the ovary being far posterior to the acetabulum and in the uterus not extending posterior to the posterior end of the seminal vesicle which reaches to the ovary. "*S. obtusum* (Linton, 1910)", found by Pritchard and Manter (1961) in *Acanthurus sandvicensis* and other *Acanthurus* species of Hawaii, probably belongs to the present species.

Haplosplanchnus adacutus Manter, 1937

HAPLOSPLANCHNUS ADACUTUS n. sp.

(Fig. 7)

Hosts:

H. maculipinnus (Müller a. Troschel)	Present in	1	of	1 examined
Halichoeres bivittatus (Bloch)	„	„ 6	„	36 „
Abudefduf marginatus (Bloch)	„	„ 1	„	8 „

Position: Intestine

Specific diagnosis: Body cylindrical, length 0,547 to 1,071 mm, width 0,247 to 0,345 mm., robust and thick in region of ventral sucker, tapering toward each end and to a point posteriorly. Eye spots or pigment granules usually present near anterior end. Oral sucker 0,090 to 0,119 mm in diameter; ventral sucker 0,127 to 0,225 mm in diameter, about $1^1/_2$ times oral sucker, with elongate, longitudinal aperture with a pair of lateral processes variable in size usually very small. Forebody usually less than half length of hindbody. Very short prepharynx, pharynx 51 to 71 μ in length by 51 to 60 μ wide; cecum extending to midtestis. Genital pore inconspicuous, opposite pharynx region. Testis elongate oval, usually nearer ventral sucker than posterior end. Genital atrium less than $^1/_2$ size of pharynx. Ovary globular, between testis and ventral sucker. Vitellaria well developed covering other organs dorsally from near anterior end of ventral sucker to near posterior end of body. Uterus preovarian. Eggs variable in size, 68 to 87 by 43 to 59 μ. Excretory vesicle forking near posterior edge of testis. Type host: Halichoeres bivittatus. Other hosts: H. maculipinnus, Abudefduf marginatus.

Discussion: It is very difficult to separate this species from Haplosplanchnus acutus. It is distinctly smaller, only one specimen of over 20 reaching a length of 1 mm, whereas the smallest of 6 specimens of H. acutus was 1,267 mm. In all except one specimen of H. adacutus, the posttesticular distance was greater than the testis-ventral sucker distance, whereas the opposite was true in all specimens of H. acutus. The ventral sucker lobes were almost always very inconspicuous in H. adacutus (except two specimens from Halichoeres maculipinnus) and very evident in H. acutus. A constant difference occurs in the relative size of the genital atrium or bulb which is small and inconspicuous in H. adacutus and as large or larger than the pharynx in H. acutus. These differences may be those of one species in different hosts but the general impression given is that the two forms (each of which was collected several times) are distinct.

Other species of Haplosplanchnus probably occur at Tortugas. Seven specimens of a form collected from an unidentified mullet seemed similar to H. pomacentri except that in 6 of the 7 the uterus with eggs extended posterior to the testis. More material will probably demonstrate this form as another species. Another form from Microspathodon chrysyrus (Cuv. a. Val.) remains unidentified because of insufficient material.

It is extremely interesting that the Haplosplanchnus species at Tortugas group themselves fairly well into certain species which differ from each other more than from species from corresponding hosts in the Pacific, e. g. Haplosplanchnus species from Tylosurus and H. species from Pomacentrus.

Schikhobalotrema adacutum (Manter, 1937) Skrjabin & Guschanskaja, 1955

Synonym: Haplosplanchnus adacutus Manter, 1937.

Hosts: Abudefduf saxatilis (J); **Halichoeres pictus* (J); **Hemiramphus brasiliensis* (C, J); **Hepsetia stipes* (J).

Site: intestine.

From Nahhas & Cable 1964

Fig. 7. H. adacutus from Halichoeres bivittatus. Ventral view.

Siddiqi & Cable, 1960

Schikhobalotrema adbrachyura n. sp. (FIGURES 19 and 20)

Description based on 10 specimens with characters of the genus. Body 0.675 to 0.682 long, 0.262 to 0.292 in maximum width at level of ventral sucker. Cuticle aspinose. Eye-spot pigment present. Oral sucker 0.086 to 0.129 by 0.108 to 0.120. Ventral sucker 0.172 to 0.240 by 0.165 to 0.195, slightly posterior to midlevel. Sucker ratio 1:1.8. Prepharynx short, pharynx 0.046 to 0.058 by 0.067 to 0.086; cecum long, extending to posterior margin of ovary. Genital pore slightly to left of midline, midway between pharynx and ventral sucker. Seminal vesicle sinuous, tubular, not extending beyond midlevel of ventral sucker. Testis entire, 0.073 to 0.086 by 0.077 to 0.103, near posterior end of body. Ovary with 5 to 6 distinct lobes, closely anterior to testis. Seminal receptacle small, round, adjacent to ovary. Vitelline follicles small, scattered from pharyngeal region almost to posterior end of body. Uterus scanty, preovarian. Eggs very few, 0.079 by 0.068. Excretory vesicle sac-shaped; excretory pore terminal.

Host: *Sparisoma* sp.

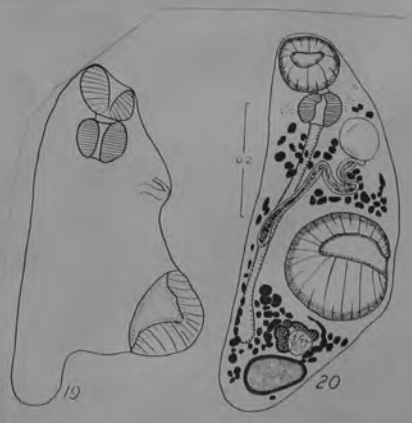
Site: intestine.

Locality: Mona Island, P. R.

Type specimen: Holotype No. 39317.

Of the 11 species in the genus *Schikhobalotrema*, *S. adbrachyura* resembles most *S. brachyura* but differs from it in having a strongly lobed ovary and shorter seminal vesicle.

Some haplosplanchids in addition to those reported above were found in the intestine of the rainbow parrotfish *Pseudoscarus quacamaia* and green parrotfish *Sparisoma viride* but were in too poor condition to be identified positively. In general, haplosplanchnids seem to deteriorate rapidly after the death of the host.



Schikhobalotrema adbrachyurum Siddiqi & Cable, 1960

Hosts: **Sparisoma flavescens* (C); **S. viride* (C); **Pseudoscarus guacamaia* (C, J); **P. plumbaeus* (J).

Site: intestine.

Nahhas & Cable, 1964

CURAÇAO + JAMAICA

Haplosplanchnidae

Schikhobalotrema bivesiculum Nahhas & Cable, 1964

Schikhobalotrema **bivesiculum** n.sp.
Figure 11 Nahhas & Cable, 1964
Host: Abudefduf saxatilis (J).
Site: intestine.
Holotype: U.S.N.M. 60260.

Description based on 6 specimens. Body elongated, more tapered posteriorly than anteriorly, 0.965-1.40 long, 0.347-0.467 wide. Cuticle aspinose; eye-spot pigment present. Oral sucker 0.098-0.180 long, 0.153-0.200 wide; ventral sucker preequatorial, 0.195-0.300 long, 0.180-0.233 wide, with elongated aperture but no posterolateral lobes; sucker ratio 1:1.35-1.48. Prepharynx short; pharynx 0.060-0.090 in diameter; esophagus short; cecum extending to midlevel of ovary. Gonads postequatorial. Testis entire, at about midlevel of hindbody, 0.200-0.267 long, 0.167-0.200 wide. Seminal vesicle bipartite; long tubular posterior portion extending to about midlevel of ovary; thick-walled anterior division with conspicuous circular muscles and 2 large nuclei on inner surface, protruding into lumen; pars prostatica difficult to interpret; possibly part of a narrow tube leaving muscular portion of seminal vesicle or within conspicuous mass filling genital atrium and probably corresponding to what has been called genital bulb; prostate cells inconspicuous. Ovary entire or slightly irregular, 0.120-0.140 long, 0.078-0.105 wide; anterior to testis; seminal receptacle dorsolateral to ovary; uterus preovarian. Genital pore median, at pharyngeal level. Eggs few, 60-78 by 40-53 μ. Vitellaria of large follicles extending from anterior margin of ventral sucker to near posterior end of body. Excretory vesicle not observed; excretory pore terminal.

11

Schikhobalotrema bivesiculum differs from all other species of the genus in its conspicuous bipartite seminal vesicle. It resembles *S. acutum* and *S. adacutum* in general topography and although it has a longitudinal aperture in the acetabulum as in those species, the sucker lacks posterolateral lobes. The bipartite seminal vesicle with a thick anterior division in this species may be of generic value but the species is placed in *Schikhobalotrema* because others showing gradations in that respect may exist.

Haplosplanchnus brachyurus Manter, 1937

HAPLOSPLANCHNUS BRACHYURUS n. sp.

(Fig. 3)

Hosts:

Cryptotomus auropunctatus (Cuv. a. Val.). Present in	2	of	15	examined
Pseudoscarus guacamaia (Cuv.)	"	"	1	" 3 "
P. coelestinus (Cuv. a. Val.)	"	"	1	" 4 "
Sparisoma aurofrenatum (Cuv. a. Val.)	"	"	1	" 3 "
S. spinidens (Guichenot)	"	"	1	" 1 "
S. viride (Bonnaterre)	"	"	2	" 4 "

Position: Intestine

Specific diagnosis: Body cylindrical, length 0,795 to 1,162 mm, width 0,332 to 0.450 mm. Oral sucker sub-terminal, 0,127 to 0,180 mm in diameter; ventral sucker in midbody or slightly posterior to midbody, 0,225 to 0,300 mm wide or from $1^1/_2$ to almost twice the diameter of oral sucker (ratio approximately 2:3), aperture transverse in all preserved specimens. The hindbody is shorter than the forebody in all but a very few specimens and in these thers was little difference in the lengths of the two regions. The ventral sucker ie thus relatively far posterior. Prepharynx very short, pharynx 59 to 99 μ long by 60 to 110 μ wide, sometimes wider than long; single cecum extends beyond the ventral sucker to levels varying from near the edge of the sucker to near the posterior end of testis, usually overlapping testis more or less. Testis of varying shape, usually somewhat elongate extending almost to or even overlapping ventral sucker, sometimes spherical. Seminal vesicle in a sinuous course from anterior end of testis to genital pore; prostatic cells inconspicuous, prostatic vesicle lacking; genital atrium only weakly muscular. Genital pore more or less median varying from midway between ventral sucker and pharynx to opposite posterior end of pharynx. Ovary globular, unlobed, near posterior edge of ventral sucker. Seminal receptacle small, posterior to ovary. Vitellaria of large follicles extending foward to pharynx or to the edge of the oral sucker. Eggs large, 87 to 97 by 53 to 61 μ. Uterus not extending posterior to testis. Type host: Sparisoma spinidens. Other hosts: S. aurofrenatum, S. viride, Pseudoscarus guacamaia, P. coelestinus, Cryptotomus auropunctatus.

Discussion. This species differs from the others at Tortugas by the short hindbody, large ventral sucker and anterior extent of vitellaria. In these respects it is especially distinct from H. obtusus. The sucker ratio is approximately that of H. sparisomae but the hindbody is much shorter and the ovary is unlobed.

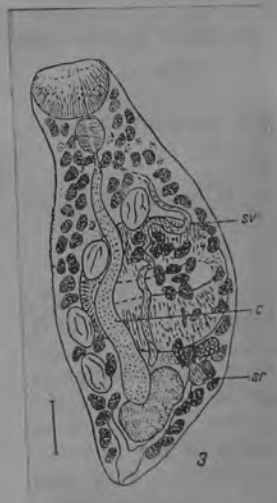


Fig. 3. H. brachyurus from Sparisoma spinidens. Dorsal view.

Schikhobalotrema crassum, n. sp. (Figs. 4-5) Pritchard & Manter, 1961

HOST: *Pomacentrus jenkinsi* Jordan & Evermann (Pomacentridae, damselfishes); 5 specimens from 1 or 2 of 30 hosts.

LOCATION: Intestine.

HOLOTYPE: U. S. Nat. Mus. Helminth. Coll., No. 39066.

DESCRIPTION (based on 4 specimens, all side views): Body 1.675 to 1.916 long by 0.771 to 1.018 deep at acetabular level; forebody 0.335 to 0.670 long, ¼ to ⅓ body length; hindbody 0.804 to 1.052 long, tapered only slightly, terminal portion somewhat contracted; cuticula thick (0.010 to 0.022). Oral sucker subterminal, 0.147 to 0.214 long by 0.147 to 0.201 deep, dorsal wall somewhat thicker than ventral wall; acetabulum 0.315 to 0.415 long by 0.214 to 0.308 deep with rounded aperture; acetabulum about twice as large as oral sucker. Prepharynx short, 0.013 to 0.020 long; pharynx 0.074 to 0.087 long by 0.087 to 0.101 deep; esophagus very short; a few large gland cells associated with esophagus and possibly prepharynx; cecum extending to near posterior end of testis.

Testis rounded or oval, 0.436 to 0.536 long by 0.295 to 0.375 deep, overlapping acetabulum ⅓ or more, posttesticular space as long as forebody or slightly longer; seminal vesicle tubular, almost straight; terminal portion of seminal vesicle surrounded by well developed prostatic cells; short ejaculatory duct connecting with short genital atrium. Genital pore median, somewhat protuberant, midway between suckers.

Ovary rounded, pretesticular, dorsal to anterior half of acetabulum, 0.127 to 0.168 long by 0.114 to 0.174 deep; seminal receptacle posterior or posterodorsal to ovary, oval, 0.181 to 0.237 long by 0.107 to 0.147 wide; vitelline follicles both rounded and elongate, extending from level of pharynx (or genital pore) to near posterior end; uterus pretesticular but not entirely preovarian, rather short, usually coiling once; metraterm present (Fig. 5) but may be inconspicuous when extended by eggs; eggs collapsed, 75 to 94 by 40 to 48. Excretory pore probably terminal, although contraction of body makes it seem ventroterminal; excretory vesicle short, oval or rounded, bifurcating at posterior edge of vitellaria, crura not traced. The name *crassum* (=thick, stout) refers to the thick body.

DISCUSSION: *S. brachyurum* and *S. hawaiensis* may also have the testis near or even overlapping the acetabulum. *S. brachyurum* has conspicuously larger suckers relative to body size, although the sucker ratio is probably similar, the hindbody is much shorter, and the vitellaria are more extensive and more follicular. *S. hawaiensis* has a shorter hindbody, a smaller sucker ratio, lacks large prostatic cells, lacks a well-differentiated metraterm, and lacks the conspicuously thick cuticula.

S. crassum also resembles *S. robustum* with which it may be sympatric, but *S. crassum* has a thicker body with a conspicuously thick cuticula, the testis overlaps the acetabulum ⅓ or more with the ovary correspondingly more anterior, and the excretory vesicle is shorter.

Schikhobalotrema **elongatum** n.sp.
Figure 12 Nahhas and Cable, 1964

Hosts: Mugil cephalus (C); *M. curema* (J).

Site: intestine.

Holotype: U.S.N.M. 60261.

Description based on 20 specimens. Body elongated, 0.734-1.49 long, 0.200-0.367 wide, with prominant cuticular rings, especially, in hindbody. Eye-spot pigment present. Oral sucker 0.090-0.150 long, 0.105-0.180 wide; ventral sucker without lobes, in anterior third or fourth of body, 0.120-0.195 in diameter, aperture circular; sucker ratio 1:1-1.32. Prepharynx about half length of pharynx; pharynx 0.060-0.075 in diameter; esophagus about as long as pharynx; cecum extending to midlevel of testis. Gonads in posterior half of body. Testis usually elongated, median, 0.167-0.366 long, 0.098-0.174 wide; seminal vesicle tubular, reaching almost midway between acetabulum and ovary; prostate cells granular, conspicuous, their ducts forming a bulbous mass just posterior to muscular genital atrium. Genital pore median, near posterior edge of pharynx. Ovary entire, anterior to testis, 0.090-0.133 long, 0.060-0.090 wide, well removed from ventral sucker except in contracted specimens; seminal receptacle dorsal, near ovarian level; uterus preovarian. Eggs 60-84 by 42-54 μ. Vitelline follicles large, extending from pharyngeal level to posterior end of body, tending to fuse in hindbody. Excretory vesicle not observed; pore terminal.

The most distinctive features of *Schikhobalotrema elongatum* are its long hindbody with prominent cuticular rings, and its well-developed bulb of prostatic ducts. In body shape, *S. elongatum* is similar to several species. *S. acutum* and *S. adacutum* have a ventral sucker with a longitudinal aperture and lateral lobes. *S. obtusum* lacks a prostatic vesicle; the genital atrium is nonmuscular and the ovary close to the acetabulum. *S. pomacentri* has an equatorial ventral sucker and *S. kyphosi* (Manter, 1947) a lobed ovary. *S. girellae* (Manter & Van Cleave, 1951) is most like *S. elongatum* but differs from that species in the extent of the seminal vesicle, in having a long tubular genital atrium and a more anterior ovary. *S. manteri* Siddiqi & Cable, 1960, differs in the distribution of the vitellaria, position of the testis and posterior extent of the uterus. *S. robustum* Pritchard & Manter, 1961, is much larger, has a thin-walled genital atrium and the genital pore on a finger-like projection.

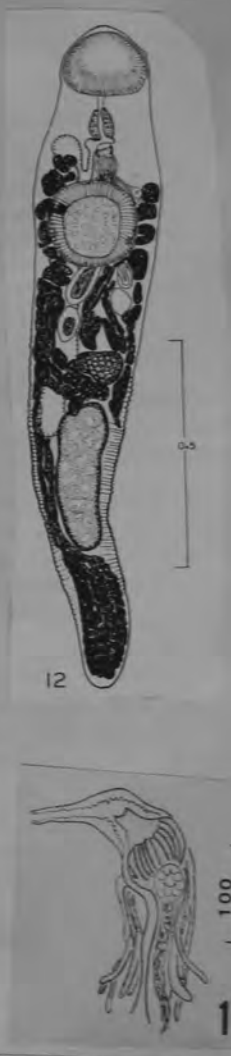


FIGURE 1. *Schikhobalotrema elongatum* from *Mugil cephalus* from Curaçao, region of terminal genitalia.
From Overstreet, 1971

HAPLOSPLANCHNUS GIRELLAE, new species Manter & Vaucleave

PLATE 13, FIGURES 17, 18

Description.—Small, elongate distomes of about equal width and thickness; widest and thickest at acetabular level; rounded anteriorly but narrowing almost to a point posteriorly. The following measurements are based on seven specimens showing a dorsal or ventral view and three specimens showing, as did most of the specimens, a side view (pl. 13, fig. 17). Length 1.073 to 1.569 mm.; width 0.219 to 0.290 mm.; thickness 0.226 to 0.277 mm. Oral sucker (os) wider than long; 0.153 to 0.204 mm. in transverse diameter; 0.153 to 0.197 mm. in depth (dorsoventral). Dorsal wall of oral sucker much thicker than ventral wall; a small papillalike projection often visible on midventral line. Acetabulum, including aperture, slightly wider than long; 0.157 to 0.219 mm. in transverse diameter or subequal to oral sucker; sucker ratio 1:0.85 to 1.04. Depth of acetabulum, as seen from side view, 0.124 to 0.146 mm. or somewhat less than depth of oral sucker. Forebody 0.299 to 0.431 mm.

Prepharynx very short; pharynx (ph) globular, 0.043 to 0.076 mm. long by 0.048 to 0.068 mm. wide by 0.051 to 0.059 mm. thick. Esophagus (e) not clearly demarked from cecum; cecum (ic) extending to a point one-fourth to two-thirds distance from acetabulum to posterior end of body, usually ending dorsal to testis.

Genital pore median, slightly nearer to oral sucker than to acetabulum, opposite posterior edge of pharynx or slightly posterior to that level. Single testis (t), elongated oval, 0.182 to 0.277 mm. long by 0.116 to 0.138 mm. wide, smooth; located usually somewhat anterior to middle of hindbody; posttesticular space very long, 0.292 to 0.474 mm., in only one specimen was it shorter than the forebody. Cirrus a thick-walled tube extending diagonally backward from genital pore, sometimes appearing spherical from surface view; prostatic vesicle (pv) ovoid to elongate, not apparent in many specimens; seminal vesicle (sv) a slightly sinuous tube ending dorsal to acetabulum; entering ventral side of prostatic vesicle slightly posterior to its middle.

Ovary (ov) spherical or ovoid, immediately posterior to acetabulum or partly dorsal to acetabulum, pretesticular, median or submedian, usually slightly dextral. Seminal receptacle spherical or ovoid, largely dorsal and slightly posterior to ovary. Vitelline glands (v) not in definite follicles but in irregular longitudinal masses, lateral, usually from level of pharynx to well posterior to testis; always interrupted opposite testis. Anterior extent of vitellaria seems to be the anterior border of acetabulum although large cells in the forebody probably are vitelline cells; the posterior extent varies from one-half to four-fifths distance between testis and posterior end of body. Uterus preovarian, short, dorsal to left half of acetabulum. Eggs (fig. 18) large, few (1 to 7), measuring (uncollapsed) 73 to 80μ by 48 to 53μ. Excretory vesicle forking dorsal to testis.

Host.—*Girella nigricans* (Ayres), common opaleye.

Location.—Intestine.

Number.—Very numerous.

Types.—Holotype and paratype, U.S.N.M. Helm. Coll. No. 37144.

Discussion.—Of the eight known species of *Haplosplanchnus*, *H. girellae* is probably most similar to *H. kyphosi* Manter, 1947, and *H. obtusus* (Linton, 1910) from Tortugas, Fla. It differs from *H. obtusus* in its long posttesticular space, in the spherical shape of the seminal receptacle, in lacking distinct vitelline follicles, in the interruption of the vitellaria opposite the testis, and in shape of the eggs. It differs from *H. kyphosi* in its unlobed ovary, relatively larger acetabulum, elongated testis, interrupted vitellaria, and smaller body size.

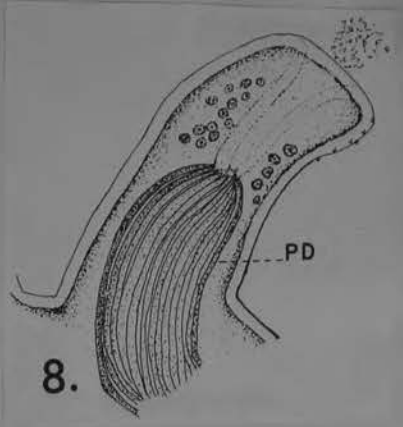
La Jolla, Cal.

—over—

Schikhobalotrema girellae (Manter and Van Cleave, 1951) Skrjabin and Guschanskaja, 1955

This species was found in all the *Girella* examined, sometimes in large numbers (103, 202). The fish kept in an aquarium for over one year had only one specimen that probably was acquired before captivity. Manter and Van Cleave (1951) described this species from *Girella nigricans* collected at La Jolla, California and placed it in the genus *Haplosplanchnus*. Skrjabin and Guschanskaja (1955) transferred most of the species of *Haplosplanchnus* to their genus *Schikhobalotrema* mainly on the basis of more extensive vitellaria in the latter. Manter and Van Cleave described a papilla on the mid-ventral wall of the oral sucker but did not mention the approximately 24 gland cells between the oral sucker and the acetabulum whose ducts converge to this papilla. They mentioned an ovoid to elongate prostatic vesicle but not the approximately 40 prostate cells alongside the acetabulum whose ducts empty into the male duct (Fig. 8). In all my specimens the cirrus was extruded.

W. E. Martin, 1978



8.

Pritchard & Manter, 1961

Schikhobalotrema glomerosum, n. sp. (Figs. 6-8)

HOSTS: *Acanthurus sandvicensis* (Streets), manini or convict tang, type host (Acanthuridae, surgeonfishes); 1 specimen from 56 hosts.
A. achilles Shaw, paku'iku'i or Achilles tang; 1 from 2 hosts.

LOCATION: Intestine.

SYNTYPES: U. S. Nat. Mus. Helminth. Coll., Nos. 39064 & 39065.

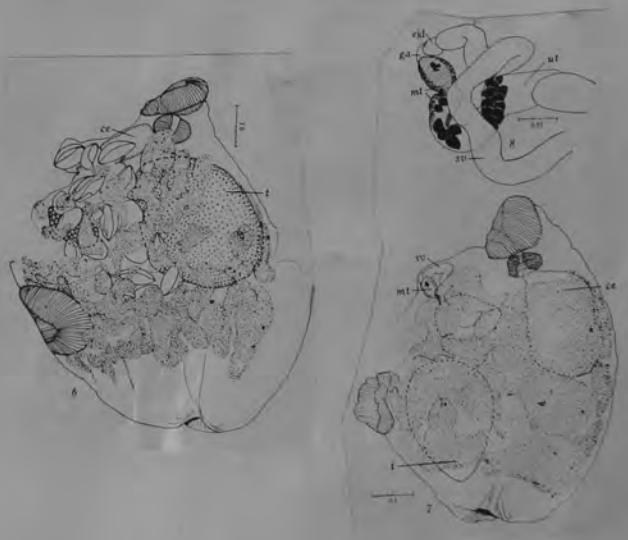
DESCRIPTION (based on both specimens): Body subspherical, 0.784 to 0.838 long by 0.556 to 0.570 thick; forebody more than twice as long as hindbody, tapered slightly toward oral sucker; hindbody truncate with somewhat invaginated end. Oral sucker 0.128 to 0.147 deep by 0.087 to 0.128 long, dorsal wall thicker than ventral wall, one specimen with small median projection on ventral edge; acetabulum about ¾ body length from anterior end, 0.083 to 0.127 deep by 0.176 to 0.201 long; sucker ratio greater than 1:1. Prepharynx very short; pharynx 0.051 to 0.059 long by 0.072 to 0.088 deep, pressed against oral sucker; esophagus short; cecum extending to anterior level of acetabulum.

Testis elongate, oval or ovate, 0.328 to 0.362 long by 0.192 to 0.261 deep, posterodorsal to acetabulum; seminal vesicle tubular, sinuous; ejaculatory duct short, entering genital atrium; prostatic cells not observed. Genital pore median, at esophageal level, somewhat protuberant.

Ovary preacetabular and pretesticular, ovate, 0.099 to 0.112 long by 0.144 to 0.182 deep, seminal receptacle not observed; vitellaria diffuse, from level of pharynx to near posterior end of body, massed together or in elongate groups; uterus extending posteriorly to level of acetabulum and then forward, metraterm joining genital atrium; 23 eggs in one specimen, yellowish, 83 to 88 long by 56 to 67 wide (collapsed eggs 83 to 107 long by 43 to 59 wide). Excretory pore opening into funnel-shaped depression at posterior end of body; vesicle not traced forward. The name *glomerosum* (=like a ball, round) refers to the shape of the body.

DISCUSSION: Although one specimen appears to have been overly flattened (ruptured body wall, testis pushed anteriorly and dorsally with a corresponding displacement of the cecum ventrally) (Fig. 6), this specimen contains mature eggs and has normal suckers. The other specimen is more macerated and has abnormal eggs, but the organs seem to be normally situated, and the terminal genital ducts are easily observed (Figs. 7-8).

S. brachyurum (Manter, 1937) and *S. adbrachyurum* Siddiqi and Cable, 1960 are the only other species in which the acetabulum may be found posterior to the midbody. In both species the cecum extends posterior to the acetabulum, the acetabulum is larger, the ovary and testis are in the hindbody, the testis is smaller than the acetabulum, the vitellaria are follicular, and the body is more elongate.



Pritchard & Manter, 1961

Schikhobalotrema hawaiensis, n. sp. (Fig. 3)

HOST: *Ctenochaetus strigosus* (Bennett), kole (Acanthuridae, surgeonfishes); 65 specimens from 5 of 19 hosts.

LOCATION: Intestine.

HOLOTYPE: U. S. Nat. Mus. Helminth. Coll., No. 39063.

DESCRIPTION (based on 18 specimens): Orange-red when alive; body plump, 0.938 to 1.441 long by 0.422 to 0.583 wide, widest at level of acetabulum; forebody only slightly shorter than hindbody, both ends tapered and bluntly rounded. Oral sucker 0.149 to 0.201 wide by 0.118 to 0.168 long, dorsal edge thicker than ventral edge; acetabulum at midbody or slightly anterior, 0.194 to 0.268 wide by 0.188 to 0.261 long, aperture rounded or somewhat transverse; sucker ratio 1:1.2 to 1.4. Prepharynx very short, pharynx usually contiguous with oral sucker; pharynx wider than long, 0.035 to 0.080 long by 0.056 to 0.101 wide; esophagus about as long as pharynx; cecum more or less dorsal, extending to testicular level, overlapping ⅓ to almost all of testis.

Testis oval or elongate-oval, 0.168 to 0.415 long by 0.127 to 0.268 wide, median in hindbody with anterior end near or overlapping posterior edge of acetabulum (in latter case, testis lies in dorsoventral plane with anterior end dorsal to acetabulum); seminal vesicle long, slender, sinuous or coiled, beginning at level of ovary; prostatic cells not well developed; no prostatic vesicle or muscular cirrus, although a pronounced constriction separates distal, carrot-shaped portion of seminal vesicle; genital atrium shallow and not conspicuously muscular; genital pore median, about midway between suckers.

Ovary elongate, sometimes slightly indented or bent near middle, slightly dextral between testis and acetabulum or dorsal to acetabulum, 0.066 to 0.154 long by 0.035 to 0.109 wide, overlapping testis or not; seminal receptacle lateral or dorsal to ovary, 0.074 to 0.104 in diameter, often inconspicuous; vitellaria extending dorsally and laterally between level of genital pore (occasionally posterior edge of pharynx) and posttesticular area, follicles often elongate. Parenchyma contains numerous, more or less conspicuous, large, nucleated cells. Uterus preovarian, containing few to as many as 30 eggs, joining genital atrium without forming metraterm; eggs yellowish, usually collapsed, 70 to 104 long by 32 to 58 wide (examples of only slightly dented eggs: 72 by 50, 75 by 53, 77 by 53, and 80 by 58). Excretory pore terminal; a short, narrow stem leading to excretory vesicle; vesicle extending to testis before bifurcating; crura extending forward to level of esophagus.

DISCUSSION: Three species, *S. brachyurum* (Manter, 1937), *S. pomacentri* (Manter, 1937), and *S. adbrachyurum* Siddiqi and Cable, 1960, have the acetabulum located at or slightly behind the midbody. Tortugas, Florida, is the type locality for the first two species and Puerto Rico is the type locality for *S. adbrachyurum*. Manter (1940) has also reported *S. pomacentri* from the Galapagos Islands.

S. hawaiensis is like *S. pomacentri* in that the hindbody may equal the forebody in length but is never shorter, and the anterior vitellaria do not extend to the oral sucker. *S. hawaiensis*, however, differs from *S. pomacentri* by lacking a prostatic vesicle, by lacking a posterior marginal projection on the oral sucker, by a less tapered and more rounded hindbody, in the testis which is larger than the acetabulum and immediately posterior to it (rather than being in the middle of the hindbody).

S. hawaiensis is like *S. brachyurum* in lacking the prostatic vesicle, in lacking a posterior marginal projection of the oral sucker, in the testis that may overlap the acetabulum, and the seminal vesicle that is sinuous rather than almost straight. It differs from *S. brachyurum* in that the hindbody is never shorter than the forebody (though it may be nearly equal), the vitellaria usually extend only to the level of the genital pore (and no farther forward than the posterior edge of the pharynx), the uterus is entirely preovarian, and the acetabulum is slightly smaller affecting the sucker ratio (1:1.2 to 1.4 as compared with 1:1.5 to 2 for *S. brachyurum*).

S. adbrachyurum has the acetabulum slightly posterior to midbody, but the testis is near the posterior end of the body, the ovary is lobed, the seminal vesicle is shorter, the eggs are wider, and the body is smaller.

27. ***Scbikbobalotrema bawaiiense*** Pritchard et Manter, 1961

(Fig. 27)

HABITAT: Intestine of *Ctenochaetus strigosus* (local name "kole") and *Acanthurus mata*; Hawaii.

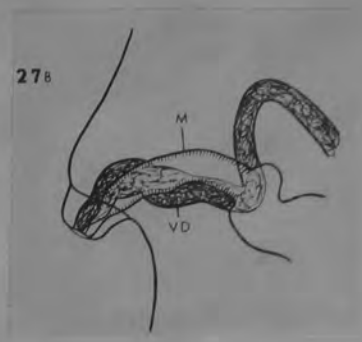
DESCRIPTION (based on nine whole mounts): Body orange-red in color, 0.8-1.35 mm long, widest at level of acetabulum, where the dorsoventral diameter is 0.4-0.5 mm. Oral sucker 0.07-0.15 X 0.13-0.2 mm, opening anteroventrally, directly followed by pharynx which is 50-80 μ by 60-80 μ. Esophagus about 0.1 mm long; intestine cylindrical, 0.25-0.4 mm long, terminating dorsal to acetabulum or anterior end of testis. Acetabulum 0.19-0.25 mm anteroposteriorly, just pre-equatorial.

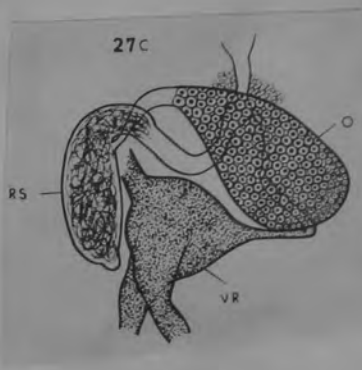
Testis oval to elongate oval, 0.2-0.35 X 0.1-0.22 mm, median, immediately or a short distance postacetabular, extending into caudal third of body. Seminal vesicle tubular, narrow, twisted or convoluted alongside metraterm, with which it opens together at apex of genital cone lying halfway between two suckers. No distinct prostatic complex. No cirrus.

Ovary longitudinally elongated, 0.07-0.12 X 0.06-0.12 mm, submedian, immediately pretesticular, dorsal to acetabulum. Shell gland complex not made out. Seminal receptacle rounded, 90-100 μ in diameter, anterodorsal to testis, well apart from ovary. Vitellaria extending profusely from level of genital cone to near posterior extremity, leaving narrow lateral marginal areas free; transverse collecting vitelline ducts meeting dorsally between acetabulum and testis. Uterus pre-ovarian; metraterm well differentiated, ciliated inside, may be everted and project beyond distal end of male duct as a cylindrical structure 93 μ long. Eggs oval, thick-shelled, 63-75 X 46-52 μ. Excretory pore terminal; arms reaching to level of pharynx.

DISCUSSION: Pritchard and Manter, the original authors of this species, state that there is no metraterm, but in our specimens from the same host species and the same locality, the metraterm is clearly seen and forms, when everted, a cylindrical structure projecting beyond the male pore, as shown in the figure.

from Yam., 1970





Schikhobalotrema **heterocotylum** n.sp.
Figure 13 Nahhag & Cable, 1964

Host: Pseudoscarus guacamaia (C)!
Site: intestine.
Holotype: U.S.N.M. 60262.

Description based on 5 specimens. Body subspherical to pyriform, 1.29-1.50 long, 0.869-0.965 wide. Cuticle thick, aspinose; eye-spot pigment present. Oral sucker 0.128-0.186 long, 0.233-0.266 wide, ventral lip with papilla bearing openings of salivary gland in forebody. Ventral sucker at midbody, 0.466-0.533 long, 0.533-0.613 wide, its interior with 2 anterior and 2 posterior tuberculated projections. Sucker ratio 1:2.6-2.8. Prepharynx short; pharynx 0.130-0.150 long, 0.105-0.135 wide; esophagus short; cecum extending to midlevel of acetabulum. Gonads in posterior third of body. Testis 0.386-0.486 long, 0.213-0.333 wide, to right of midline; seminal vesicle long, extending to posterior level of ventral sucker or slightly beyond; pars prostatica small, inconspicuous. Ovary entire to slightly lobed, 0.133-0.180 long, 0.098-0.135 wide, median, posterior to acetabulum; seminal receptacle postovarian and much larger than ovary; uterus preovarian. Genital pore ventral, near midlevel of pharynx. Eggs 84-99 by 53-75 μ. Vitelline follicles numerous, extending from midlevel of pharynx to posterior end of body. Excretory vesicle not observed.

No haplosplanchnid has been described as having an acetabulum with the tuberculated lobes characteristic of this species. Most like it in other respects is *S. brachyurum* (Manter, 1937) a paratype of which we have examined and found to lack such lobes. It further differs from *S. heterocotylum* in having a different body shape, a smaller ventral sucker and a different sucker ratio. Although similar in body shape, *S. glomerosum* Pritchard and Manter, 1961, has a smaller ventral sucker, a preacetabular ovary, more anterior testis and a well-developed metraterm.

Haplonsplanchnidae

Schikhobalotrema kyphosi (Manter, 1947) Skrjabin & Guschanskaja, 1955

115. Haplosplanchnus kyphosi (Manter, 1947) Skrj. 19

Figs. 91, 92

HOSTS: *Kyphosus sectatrix* (Linn.), white chub; type host; in 1 of 8 hosts examined. *Kyphosus incisor* (Cuv. & Val.), yellow chub; in 1 of 5 hosts examined.

LOCATION: Intestine.

Description (based on two specimens): Body elongate and slender, rounded at anterior end, tapering to a point posteriorly; unspined; length 2.700 to 3.564 mm, greatest width 0.525 to 0.712 mm, at level of acetabulum. Oral sucker subspherical, 0.420 mm in diameter or expanded (in the smaller specimen) to a diameter of 0.485 mm; acetabulum circular, 0.278 to 0.285 mm in diameter, with rounded aperture; sucker ratio 1:0.57 to 0.67 or about 3:2. Forebody about 1/3 body length. Very short prepharynx; pharynx 0.110 to 0.144 mm long by 0.105 to 0.134 mm wide; esophagus slightly shorter than pharynx; single cecum long, extending either to posterior edge of testis or halfway between testis and posterior end of body. Genital pore median about halfway between suckers. Testis single, subtriangular or elongate and irregular in shape, just posterior to midbody; posttesticular distance 0.810 to 1.390 mm, nearly as long as or longer than forebody. Cirrus or ejaculatory duct slender, inconspicuous; prostatic vesicle not observed; sinuous seminal vesicle extending not quite to midacetabular level. Ovary 3-lobed, near midbody, to the right, at right anterior edge of testis; Mehlis' gland large; seminal receptacle large, to left of ovary, just anterior to testis; uterus between Mehlis' gland and acetabulum; eggs rather wide and thick-shelled, 76 to 90 by 56 to 65 μ (Fig. 92). Vitelline follicles of varied shape, tending to become elongated, continuous in sides of body from level of esophagus to near posterior end of body, contiguous posterior to testis. Excretory pore terminal; excretory vesicle extending at least to testis, its bifurcation not observed, one branch of it extends slightly anterior to acetabulum.

Discussion: Eight species of *Haplosplanchnus* have been named: *H. pachysomus* (Eysenhardt, 1829) Looss, 1902; *H. sparisomae* Manter, 1937; *H. obtusus* (Linton, 1910) Manter, 1937; *H. brachyurus* Manter, 1937; *H. pomacentri* Manter, 1937; *H. acutus* (Linton, 1910) Manter, 1937; *H. adacutus* Manter, 1937; and *H. purii* Srivastava, 1939. *H. kyphosi* is larger than most of these species and is more elongate. The type species, *H. pachysomus*, and *H. purii* have greatly reduced vitellaria limited to the region of the ovary. *H. sparisomae* is the only other species with lobed ovary and seems to be the most closely related species. It differs in body shape, sucker ratio (the acetabulum is 1.5 times the oral sucker), in extent of uterus, and in its very short posttesticular space. *H. kyphosi* is the seventh species in the genus collected at Tortugas. Two of these seven species occur in the Galapagos Islands. *H. pachysomus* has been reported from the Mediterranean and from Japan, *H. purii* from the Bay of Bengal and the Arabian Sea.

Schikhobalotrema kyphosi (Manter, 1947) Skrjabin and Guschanskaja, 1955

Haplosplanchnus kyphosi Manter, 1947.

Host: Kyphosus sectatrix (3 of 6). Overstreet 1969

Site: Pyloric caeca, occasionally in upper intestine.

Additional measurements and discussion: Six specimens 1.9 to 2.8 long by 0.52 to 0.79 wide have sucker ratios of 1:0.6 to 1.1, depending on the expansion of the oral sucker. The oral sucker is 0.29 to 0.46 wide, and the acetabulum is 0.23 to 0.35 wide. Forebody is 26 to 36% of the body length. Pharynx is 0.11 to 0.17 long by 0.12 to 0.17 wide. Eggs are 80 to 92 by 51 to 64 microns. The anterior limit of the excretory vesicle may reach the level of the pharynx, and the extremely sinuous seminal vesicle may extend posterior to the testis. Sensory papillae are prominent on the oral sucker and anterior end, as Manter (1937b:385) predicted for all species of "*Haplosplanchnus*." Overstreet, 1969

Siddiqi & Cable,1960

FAMILY HAPLOSPLANCHNIDAE Poche, 1925

Schikhobalotrema manteri n. sp. (figure 15)

Description based on 6 specimens with characters of the genus. Body 1.500 to 1.951 long, 0.337 to 0.420 wide, rounded anteriorly, tapering posteriorly. Cuticle aspinose. Eye-spot pigment present. Oral sucker 0.135 to 0.172 by 0.142 to 0.195. Ventral sucker 0.180 to 0.225 by 0.210 to 0.265, about one third body length from anterior end. Sucker ratio 1:1.3. Pharynx 0.082 to 0.112 by 0.090 to 0.105, esophagus short, cecum slender, its extent not observable. Testis elongate, rarely lobulated, 0.202 to 0.390 by 0.075 0.112, near posterior end of body. Genital pore ventral, about midway between suckers. Cirrus sac absent; seminal vesicle sinuous, tubular. Ovary entire, 0.075 to 0.157 by 0.068 to 0.082, submedian to left, postequatorial. Vitellaria filling most of available space from posterior margin of ventral sucker to or slightly posterior to testis; follicles small. Seminal receptacle small, spherical, posterior to, and slightly to left of, ovary. Uterus scanty, but extending well posterior to ovary. Eggs few, 0.056 to 0.061 by 0.041 to 0.043. Excretory system not observed.

Host: identified only as a "reef fish with a collar."

Site: intestine.

Locality: Punta Arenas, P. R.

Type specimen: Holotype No. 39313.

Schikhobalotrema manteri differs from all other species of the genus in the distribution of vitellaria, the relative position of the gonads, and the posterior extent of the uterus.

The genus *Schikhobalotrema* was erected by Skrjabin and Guschanskaja (1955) for species of the genus *Haplosplanchnus* which have extensive vitellaria, thereby restricting *Haplosplanchus* to those which have sparse vitellaria. We have accepted this arrangement, but it would not be surprising to find intermediate species that would invalidate *Schikhobalotrema*.

Haplosplanchnidae

Haplosplanchnus obtusus (Linton) 1910 Manter, 1937

HAPLOSPLANCHNUS OBTUSUS (LINTON)

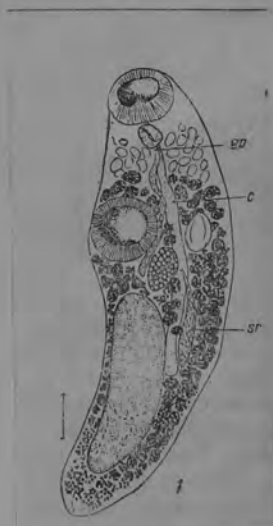
(Fig. 1)

Synonym: Deradena obtusa Linton.
Hosts: Acanthurus caeruleus Bloch et Schneider.
Acanthurus hepatus (Linn.), recorded by Linton, 1910.
Position: Intestine.

Frequency: Few specimens in 2 of 12 A. caeruleus examined.

Specific diagnosis: Body 0.975 to 1,439 by 0,262 to 0,360 mm. Suckers subequal. Oral sucker sub-terminal, 0,127 to 0,202 mm. wide, with ventral projection, mouth ventral. Ventral sucker $^1/_3$ to $^1/_4$ from anterior end, only very slightly larger than oral sucker, 0,142 to 0,210 mm. in diameter, aperture round or widely oval. Pharynx 53 to 71 μ long by 44 to 82 μ wide; esophagus short; cecum extending posterior to ovary and as far back as mid-testis. Testis usually much elongated, sometimes oval or irregular in shape. Seminal vesicle only slightly coiled. Genital pore median, opposite posterior end of pharynx. Ovary unlobed, near posterior end of ventral sucker, usually little separated from testis. Seminal receptacle long and narrow extending far posterior to ovary (less elongate in Linton's specimen). Vitellaria variable, follicles easily disintegrating into yolk cells, extending anterior to ventral sucker as far as pharynx in two specimens but only as far as the ventral sucker in two other specimens. The gland cells in the neck region seem to be yolk cells without yolk granules. Eggs 53 to 75 μ by 44 to 82 μ, tending to be relatively rather wide. Uterus not extending posterior to testis. Excretory vesicle forking dorsal to testis. Type host: Acanthurus hepatus. Other host: Acanthurus caeruleus.

Discussion. This species is distinguished from all others at Tortugas by the almost equal size of the suckers and the elongated seminal receptacle. The hindbody is long, the ovary unlobed in contrast to certain other species. It differs from H. pachysomus in length of cecum, in extent of vitellaria and in larger size of eggs.



Schikhobalotrema obtusum (Linton, 1910) Skrjabin & Guschanskaja, 1955

Synonyms: Deradena obtusa Linton, 1910; *Haplosplanchnus obtusus* (Linton) Manter, 1937.

Host: Acanthurus hepatus (C).

Site: intestine.

Nahhas & Cable, 1964

Fig. 1. Haplosplanchnus obtusus (Linton) from Acanthurus caeruleus. Ventral view.

Schikhobalotrema obtusa (Linton, 1910) Skrjabin and Guschanskaja, 1955
(FIGURE 18)

Synonyms:
Deradena obtusa Linton, 1910.
Haplosplanchnus obtusa (Linton) Manter, 1937.
Host: **Acanthurus bahianus*, *Sparisoma viride*.
Site: intestine.
Locality: Mona Island, P. R.
Deposited specimen: No. 39316.

from Siddiqi + Cable, 1960

Schikhobalotrema obtusum (Linton, 1910) Skr. & Gusch., 1955

HOSTS: *Acanthurus sandvicensis* (Streets), manini or conviet tang (Acanthuridae, surgeonfishes); 7 specimens from 2 to 12 of 56 hosts.

A. achilles Shaw, paku'iku'i or Achilles tang (Acanthuridae); 7 specimens from 1 of 2 hosts.
A. sp. (Acanthuridae); 2 specimens
LOCATION: Intestine.

DISCUSSION: These specimens vary considerably. Some resemble Linton's (1910) Fig. 160 (corrected to show a single cecum) or Siddiqi and Cable's (1960) Fig. 18; some resemble Manter's (1937) Fig. 1 except that none possesses such an elongate testis; and a few even resemble *S. crassum* in the position of the testis. Some specimens show a conspicuous ventral projection of the oral sucker, others seem to lack the projection; some show 4 to 6 pairs of oral papillae, others lack papillae. The species, however, is distinguished by the almost equal size of the suckers, a hindbody noticeably longer than the forebody, the testis usually in middle of the hindbody, the lack of a prostatic vesicle and muscular genital atrium, and a rounded aperture of the acetabulum.

The type specimen of *S. obtusum* was kindly loaned by the U. S. National Museum. There are three specimens on the slide, No. 8518, two of which are broken and all of which are located at the extreme edge of the cover glass where the mounting medium causes a distorted view. The almost equal size of the suckers and the elongate hindbody may, however, be confirmed.

Manter (1955) reported this species from Hawaii, also from *Acanthurus sandvicensis*. In addition it has been reported from Tortugas, Florida, and Puerto Rico.

from Pritchard & Manter (1961)
Hawaii

Schikhobalotrema pomacentri (Manter,1937) Skrjabin & Guschanskaja, 1955
Haplosplanchnidae

SYN: Haplosplanchnus pomacentri Manter, 1937

HAPLOSPLANCHNUS POMACENTRI n. sp.
(Figs. 4 a. 5)

Hosts:

Pomacentrus leucostictus Müller a. Troschel (Poey). Present in 18 of 31 examined.

P. xanthurus Poey (Müller a. Tros.). Present in 3 of 13 examined.

Position: Intestine.

Specific diagnosis: Length 0,300 to 1,225 mm, width 0,157 to 0,450 mm. Oral sucker sub-terminal with posterior marginal projection well developed and with three pairs of papillae. Two additional pairs of papillae on head dorsal to oral sucker. Ventral sucker more or less anterior to midbody, with transverse aperture (except very rarely subcircular), larger than oral sucker. Sucker ratio almost exactly 2:3. Oral sucker 0,093 to 0,165 mm, ventral sucker 0,119 to 0,240 mm in diameter. Hindbody always at least slightly longer than forebody although sometimes almost the same length. Very short prepharynx, pharynx globular often wider than long, length 42 to 75 μ, width 42 to 88 μ; esophagus short; cecum extending to various levels, sometimes only slightly beyond ventral sucker, sometimes to midtestis. Genital pore median or submedian, opposite posterior end of pharynx. Testis elongate-oval, subspherical or somewhat subtriangular in shape (often with one side extending forward beyond the other). Seminal vesicle little coiled; prostatic cells few and small; well developed prostatic vesicle with tall transparent cells. Genital atrium with well developed muscular anterior wall. Ovary spherical, unlobed, more or less median, varying from close to testis to close to ventral sucker. Seminal receptacle small, spherical, anterior or posterior to ovary. Vitellaria of large follicles tending to coalesce especially in longitudinal masses, extending from posterior end usually to pharynx region, rarely only to ventral sucker. Eggs 80 to 93 by 44 to 56 μ. Uterus not extending posterior to testis. Excretory pore dorsal, sub-terminal; excretory vesicle forking at levels varying from posterior to testis to anterior border of testis; excretory branches slightly coiled, extending into forebody. Type host: Pomacentrus leucostictus. Other host: P. xanthurus.

Discussion. This species was not reported by Linton. It differs from all others at Tortugas in the presence of a distinct prostatic vesicle with tall transparent cells and in a more muscular genital atrium. The species most similar to it is H. brachyurus from parrot fish. But in addition to the points noted, H. pomacentri differs in that the hindbody is never shorter than the forebody.

The above description is based on a study of 17 specimens representing 7 different collections. Two specimens over 1 mm in length (fig. 5) were without eggs, although many smaller ones contained eggs (fig. 4). The smallest specimen 0,3 mm in length contained an egg 80 by 44 μ or much larger than the ovary.

All species of Haplosplanchnus doubtless possess sensory papillae on the oral sucker and anterior end of the body. These are usuall not evident on pressed and mounted specimens.

A Haplosplanchnus species from Pomacentrus rectifraenum Gill collected in the Galapagos Islands agrees with H. pomacentri from Tortugas in all important respects including the prostatic vesicle and is probably the same species.

Tortugas, Fla.

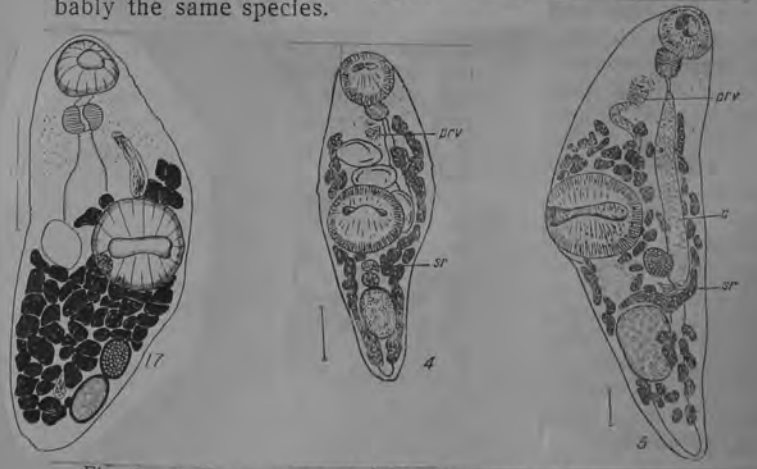


Fig. 4 a. 5. H. pomacentri from Pomacentrus leucostictus. Ventral views.

Schikhobalotrema pomacentri (Manter, 1937), Skrjabin and Guschanskaja, 1955 (FIGURE 17)

Synonym:
Haplosplanchnus pomacentri Manter, 1937.
Host: **Pomacentrus fuscus*.
Site: intestine.
Locality: Punta Arenas, P. R.
Deposited specimen: No. 39315.

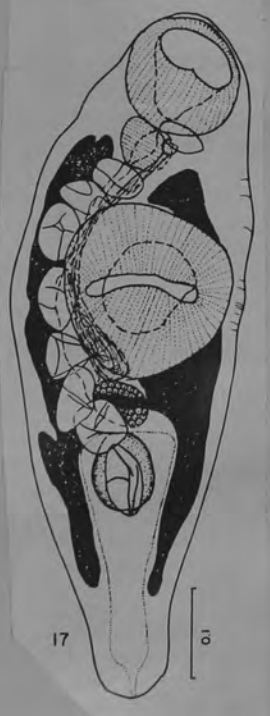
Schikhobalotrema pomacentri (Manter, 1937) Skrajabin & Guschanskaja, 1955

Synonym: Haplosplanchnus pomacentri Manter, 1937.

Hosts: **Pomacentrus analis* (C); **P. fuscus* (C, J); **P. leucosticus* (C); **Microspathodon chrysurus* (C, J).

Site: intestine. Nahhas & Cable, 1964

CURAÇAO + JAMAICA



Haplosplanchnus (Schikhobalotrema) pomacentri Manter, 1937
(fig. 17)

Host.—*Pomacentrus leucostictus* Müller and Troschel, beau gregoire; and *Pomacentrus planifrons* (Cuv. and Val.); *petite jacquette*, new host record; family Pomacentridae.

Incidence of infection.—In 1 of 4 *P. leucostictus* and 2 of 2 *P. planifrons*.

Location.—Intestine.

Locality.—Galeta Point, Republic of Panama [new locality record].

Discussion.—*H. pomacentri* formerly was known only from fishes of the genus *Pomacentrus;* from Tortugas, Florida, in *P. leucostictus* and *P. xanthurus* Poey, (Manter, 1937, Manter, 1947), and from Galapagos Islands, in *P. rectifraenum* Gill, (Manter, 1940c).

One specimen of *H. pomacentri* in our collection lacks a testis.

Sogandares-Sogandares, 1961

Pritchard & Manter, 1961

Schikhobalotrema robustum, n. sp. (Figs. 1-2)

HOSTS: *Pomacentrus jenkinsi* Jordan & Evermann, type host (Pomacentridae, damselfishes); 6 specimens from 1 or 2 of 30 hosts.
Acanthurus sandvicensis (Streets), manini or convict tang (Acanthuridae, surgeonfishes); 3 specimens from 1 of 56 hosts.
Chaetodon fremblii Bennett (Chaetodontidae, butterfly fishes); 3 specimens from 1 of 17 hosts.
Zebrasoma flavescens (Bennett), lau'i-pala or yellow tang (Acanthuridae, surgeonfishes); 5 specimens from 1 of 10 hosts.

LOCATION: Intestine.

HOLOTYPE: U. S. Nat. Mus. Helminth. Coll., No. 39062.

DESCRIPTION (15 specimens measured, but only 3 flattened dorsoventrally): Body elongate, 1.240 to 2.747 long by 0.449 to 0.469 wide (0.295 to 0.817 thick) at acetabular level; forebody about 1/5 to 1/4 body length, tapered to oral sucker at anterior end; hindbody 0.838 to 1.789 long, posterior half tapered and bluntly pointed terminally. Oral sucker 0.181 to 0.194 wide (0.114 to 0.221 deep) by 0.112 to 0.214 long with or without noticeable median projection on ventral edge, dorsal wall somewhat thicker than ventral wall; acetabulum 0.201 to 0.256 wide (0.120 to 0.348 deep) by 0.131 to 0.402 long; sucker ratio, based on widths, 1:1.03 to 1.33 (based on lengths, 1:1.08 to 2.2). Prepharynx 0.011 to 0.047 long, pharynx sometimes pressed against oral sucker; pharynx 0.040 to 0.080 long by 0.080 to 0.094 wide (0.064 to 0.107 deep); esophagus as long as pharynx or longer; large gland cells 0.030 to 0.048 in diameter associated with digestive system in forebody, ducts of a few glands leading to prepharynx while most lead to esophagus and anterior part of cecum; cecum overlaps testis 1/3 or more.

Testis rounded or oval, 0.332 to 0.594 long by 0.281 to 0.302 wide (0.141 to 0.415 deep), in middle or anterior part of hindbody 0.087 to 0.503 posterior to acetabulum, posttesticular space 0.344 to 0.938 long or longer than forebody; seminal vesicle long, tubular, sinuous with one or two distinct loops; not far from genital pore a constriction separates an anterior, tapering, carrot-shaped portion of seminal vesicle surrounded by large prostatic cells (Fig. 2); short, nonmuscular ejaculatory duct enters genital atrium; atrium shorter than terminal portion of seminal vesicle and thin-walled. Genital pore on a finger-like protrusion, midway between oral sucker and acetabulum, opposite esophagus.

Ovary subglobular, 0.096 to 0.194 long by 0.114 to 0.128 wide (0.074 to 0.168 deep), immediately pretesticular; seminal receptacle posterodorsal to ovary, spherical or ovoid, 0.040 to 0.228 long by 0.040 to 0.201 deep; vitellaria extending from level between genital pore and acetabulum to near posterior end of body, uninterrupted at least dorsally, masses large and elongate; uterus preovarian, looping once or twice near ovary and then extending directly to genital atrium; eggs few to numerous, uncollapsed eggs 72 to 83 long by 50 to 58 wide, collapsed eggs 64 to 98 by 30 to 56. Excretory pore terminal, excretory vesicle bifurcating near posterior end of testis, crura extending to anterior end of body.

DISCUSSION: In size and long posttesticular space *S. robustum* is similar to *S. kyphosi* (Manter, 1947), but it differs markedly in having an unlobed ovary, much larger testis, larger sucker ratio, and less follicular vitellaria.

S. robustum is most similar to *S. girellae* (Manter and Van Cleave, 1951). It differs in being much larger, although the egg size is about the same. The difference in body size makes the eggs appear to be much larger in *S. girellae*. The so-called cirrus of *S. girellae* is probably a thick-walled tubular atrium although entrance of the uterus could not be seen in 15 paratypes. The atrial tube in *S. robustum* is thin-walled and shorter. Prostatic cells are much smaller in *S. girellae*.

Although the interruption of the vitelline glands opposite the testis was emphasized for *S. girellae*, we now find that indistinct strands of vitelline material connect the pre- and posttesticular vitelline masses in some of the paratype specimens. In *S. robustum* the dorsal connections are conspicuous.

also in Queensland, Australia

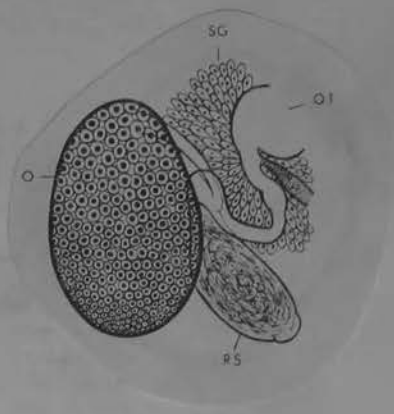
28. ***Schikhobalotrema robustum*** Pritchard et Manter, 1961

(Fig. 28)

HABITAT: Intestine of *Acanthurus sandvicensis*; Hawaii.

DESCRIPTION: This species occurred in the same host species as *Schikhobalotrema acanthuri* n. sp. Four flattened specimens gave the following measurements: Body 1.55-2.2 × 0.5-0.6 mm; oral sucker 0.14-0.15 × 0.19-0.21 mm; pharynx 70 × 60-80 μ; acetabulum 0.19-0.23 mm in diameter. Testis 0.2-0.5 × 0.17-0.35 mm; ovary 0.11-0.16 × 0.11 mm. The vitellaria do not extend down to the extreme posterior end of the body in strong contrast with those of *Schikhobalotrema acanthuri*. Eggs 74-82 × 48-60 μ in life.

Yam., 1970



Haplosplanchnus sparisomae Manter, 1937

HAPLOSPLANCHNUS SPARISOMAE n. sp.

(Fig. 2)

Hosts: Sparisoma flavescens (Bloch a. Schneider). Present in 3 of 12 examined.
Sparisoma viride (Bonnaterre). Present in 2 of 4 examined.

Position: Intestine.

Specific diagnosis: Body 0,982 to 2,205 by 0,420 to 0,750 mm. Oral sucker sub-terminal, 0,127 to 0,292 mm in diameter. Ventral sucker about $^1/_3$ from anterior end, about $1^1/_2$ times the diameter of oral sucker, 0,217 to 0,450 mm wide, aperture round. Pharynx 76 to 187 μ in length by 58 to 165 μ in width. (In the specimen from S. viride the pharynx was either much larger or abnormally inflated, measuring 225 μ in length and 240 μ in width). The cecum extends beyond the anterior end of the testis usually to midtestis, sometimes almost to the end of the testis. Testis elongate, oval or irregular in shape. Seminal vesicle little coiled, almost straight. Genital pore inconspicuous, opposite posterior portion of pharynx. Ovary deeply 3 or 4 lobed and often seems to consist of 3 of 4 separated, globular parts. It lies immediately posterior to the ventral sucker or partly or wholly dorsal to the ventral sucker. Seminal receptacle oval, posterior to ovary. Vitellaria usually extending to pharynx but sometimes not reaching anterior to ventral sucker. Eggs 83 to 93 by 51 to 63 μ. Uterus not extending posterior to testis. Excretory vesicle forking posterior to testis and with crura extending to region of oral sucker. Type host: Sparisoma flavescens. Other host: S. viride.

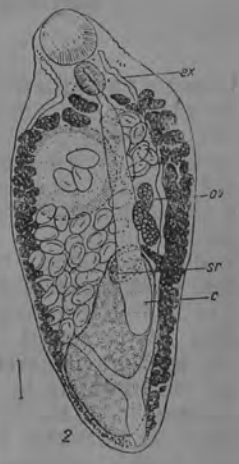
Discussion. This species is distinguished from others at Tortugas by the large ventral sucker with circular aperture and the deeply lobed or tripartite ovary. It differs from H. pachysomus in sucker ratio, shape of ovary, extent of vitellaria and in its much larger eggs.

FAMILY HAPLOSPLANCHNIDAE
Poche 1925

Schikhobalotrema sparisoma (Manter, 1937)
Skrjabin and Guschanskaja, 1955

Haplosplanchnus sparisoma Manter, 1937.

Host: *Nicholsina usta* (2 of 3)*.
Site: Intestine. Overstreet 1969



Schikhobalotrema sparisomae (Manter, 1937)
Skrjabin & Guschanskaja, 1955

Synonym: *Haplosplanchnus sparisomae* Manter, 1937.

Hosts: **Pseudoscarus guacamaia* (C, J); **Scarus croicensis* (C); **Scarus* sp. (J); **Sparisoma abildgaardi* (C, J); **S. brachiale* (J); **S. flavescens* (J); **S. radians* (J).

Site: intestine.

Nahhas & Cable, 1964
CURAÇAO + JAMAICA

Fig. 2. H. sparisomae from Sparisoma flavecens. Dorsal view. The vitelline follicles dorsal to the uterus and testis are omitted.

SCHIZORHOBALOTREMA