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Binder 155, Opecoelidae Plagioporinae M-N [Trematoda Taxon Notebooks]

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ALLOCREADIIDAE Stossich, 1904

5. *Plagioporus (Plagioporus) macassarensis* n. sp. ^{Yamaguti, 1952}
Pl. IV, Fig. 18.

Habitat. Small intestine of *Lethrinus* sp.

Material and locality. A single gravid specimen, examined in life for excretory system, fixed in acetic sublimate under a cover glass, stained and mounted as usual; Macassar.

Body spatulate, with blunt ends, about 5 mm long, 1.16 mm wide at middle. Cuticle unarmed. Subcuticular longitudinal muscle strongly developed. Oral sucker subterminal, 0.3×0.35 mm. Prepharynx very short and wide, with clusters of accompanying cells on each side. Pharynx 0.175×0.21 mm. Esophagus moderately muscular, 0.26 mm long, surrounded by accompanying cells. Cecae wide, terminating at posterior extremity. Acetabulum 0.5×0.525 mm, situated at junction of anterior with middle third of body. Testes subglobular, oblique, contiguous, a little behind midbody; right posterior testis measuring 0.5×0.375 mm, left anterior one 0.42×0.375 mm. Cirrus pouch club-shaped, 0.75×0.14 mm, consisting of a layer of longitudinal muscle, extending obliquely from anterodextral margin of acetabulum to genital pore which lies in the left submedian line ventral to the cecum just behind the intestinal bifurcation. Vesicula seminalis constricted into two portions; posterior portion elliptical, 0.27×0.13 mm anterior portion fusiform, 0.275×0.095 mm, marked off from ductus ejaculatorius by a distinct partition. There is no distinct pars prostatica, though prostate cells are present within the cirrus pouch. Ovary subglobular, 0.32 mm in diameter, situated immediately in front of right testis. The germiduct shows at its origin a marked constriction toward which elongated gland cells are converged, then it forms a bulbous swelling 30μ wide and lined with distinctly nucleated epithelia. It joins the receptaculum seminis and Laurer canal at the same point as shown in Fig. 18. Receptaculum seminis oval, 0.18×0.12 mm, bordering on right side of ovary. Laurer canal running forward sinuously toward right cecum, on the dorsal



side of which it opens to the exterior at the level of the vitelline reservoir. Uterus descending from right to left as far as anterior testis, then turning back on itself and winding its way forward from left to right; finally running obliquely forward along cirrus pouch. Eggs oval, thin-shelled, $60-66 \times 41-42 \mu$ in life. Vitelline gland divided on each side into about 10 grape-like bunches, extending along intestine, on the left from genital pore to posterior extremity, but commencing on the right a little more posteriorly. Excretory vesicle tubular, forming bulbous dilatation 0.22 mm wide just in front of its terminal opening, much more widely swollen at its anterior end reaching to acetabulum, giving off a pair of lateral collecting vessels between ovary and testes; each collecting vessel divided in neck region into an anterior and a posterior tubule.

probably Allocreadium

***Plagioporus macrouterinus* n. sp. Haderlie, 1953**
(Pl. 34, a, b)

Host.—*Ptychocheilus grandis*, in intestine.

The Sacramento squawfish is a species native to California, found in the Sacramento-San Joaquin drainage basin, in the Russian River, and in the Pajaro River system. In 2 squawfish collected from Deer Creek, Tehama County, several adult trematodes were found in the intestines. In life the flukes looked and behaved very much like *Crepidostomum farionis* collected from trout, but the stained and mounted worms lack the characteristic oral papillae and are thus excluded from the genus *Crepidostomum*.

Professor George R. LaRue of the University of Michigan has been kind enough to study my mounted specimens and has pointed out that these worms are not close to the genus *Crepidostomum* nor the genus *Allocreadium*, but that they are much like the genus *Plagioporus*. After a thorough study of the material, it seems logical to include this form in the genus *Plagioporus*, and to describe it as a new species, *Plagioporus macrouterinus*.

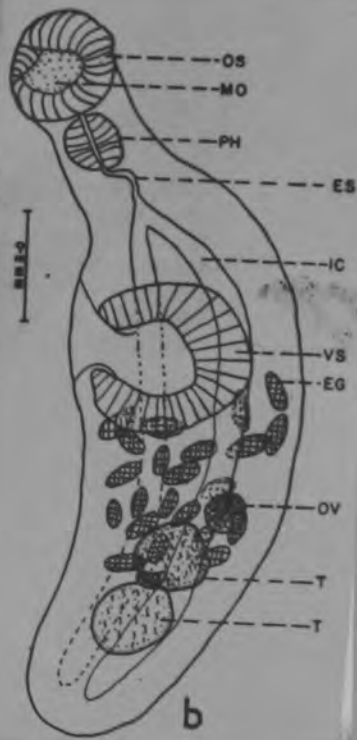
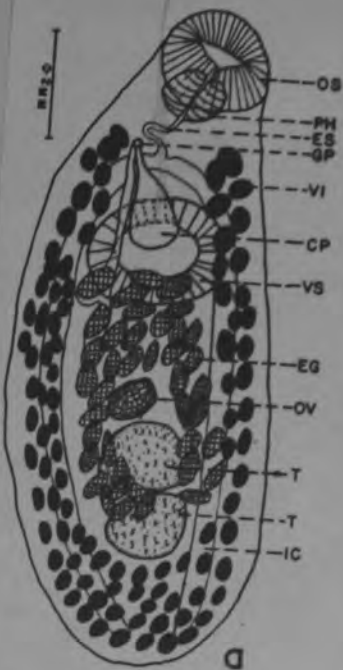
This trematode differs from all others assigned to the genus *Plagioporus* in the posterior extent of the uterus. In other species of the genus the uterus is limited to the area between the anterior testis and the acetabulum. In *Plagioporus macrouterinus* the uterus extends posteriorly to the posterior testis.

There are ten specimens of this trematode in my collection. They are all of fairly uniform size averaging 1.39 (1.19–1.60) mm. long and 0.43 (0.38–0.46) mm. wide. The oral sucker is round, 0.20 (0.19–0.21) mm. in diameter. There is a short but distinct prepharynx, followed by a bulbous pharynx 0.11 mm. in diameter. The esophagus is short but often tortuous. The intestinal bifurcation is just anterior to the ventral sucker, and the crura run to near the posterior end of the fluke.

The uterus is large and voluminous and is filled with large yellow-shelled eggs. The uterus makes a descending loop from the oötype, then it ascends, crosses to the other side of the worm, descends again posteriorly to the level of the posterior testis, and then ascends to the genital pore. The cirrus pouch is heavy, pear-shaped, slender near the pore, and thick posteriorly. It contains a large broad vesicula seminalis. The cirrus pouch extends dorsal to the acetabulum and almost to the middle of the latter. The testes are slightly diagonal, the anterior one a little to the left of the ovary and close to it. The testes average 0.19 mm. diameter; the ovary averages 0.12 mm. in diameter. The vitellaria consist of large follicles extending in lateral rows from the level of the genital pore to near the posterior end. The posttesticular field is filled in solidly with follicles. Egg in

the uterus average 0.082 (0.077–0.080) mm. long by 0.049 (0.042–0.053) mm. wide. The shells are bright yellow in color.

Nothing is known about the developmental stages of this fluke. It is not a widespread parasite of the squawfish, since it was found in only one locality.



Plagioporus maorum n.sp. ALLISON, 1966

Figs. 1-4

Host: *Octopus maorum* HUTTON (KIDNEY COELOM)

Locality: Kaikoura.

Holotype: Canterbury Museum.

Body elongate, post-acetabular region broad with posterior end rounded, greatest width just posterior to acetabulum. Pre-acetabular region narrower and tapering. Cuticle smooth, no spines present. The measurements are as follows:

length	3.2-3.7mm	pharynx length	0.2mm
width	1.15-1.2mm	pharynx width	0.1mm
acetabulum	0.47mm	sucker ratio: 1:1.5	
oral sucker	0.3mm		

There is no pre-pharynx, but an elongated pharynx leads into a very short oesophagus which bifurcates to form the two intestinal caeca. The bifurcation occurs about half way between the anterior end and the anterior edge of the acetabulum. The intestinal caeca extend almost to the posterior end. The acetabulum is situated one-third the body length from the anterior end.

The genital pore lies to the right of the mid-line and directly ventral to the intestinal caecum on that side. A cirrus sac is present, running from the genital pore diagonally to the left border of the acetabulum. The basal portion is occupied by the coiled vesicula seminalis and the distal portion with the cirrus. The prostatic cells are scattered. The vasa deferentia pass posteriorly, close together for a short distance, then separate (mid acetabulum) and run one to each testis. The testes are lobed obliquely tandem and lie in the intercaecal space. They are equal in size, or the posterior one is sometimes slightly larger.

The lobate ovary is median, in front of the anterior (right) testis. The oviduct runs ventrally from the anterior of the ovary to the ootype which lies slightly to the left side and close to the vitelline reservoir. The ootype receives a duct from the reservoir. A Laurer's canal is present and is directly continuous with the receptaculum seminis, which enters the oviduct close to the ootype. The ootype passes on as the uterus which undergoes several loops between the ovary and the acetabulum. The metraterm lies dorsal to the cirrus sac and opens at the genital pore.

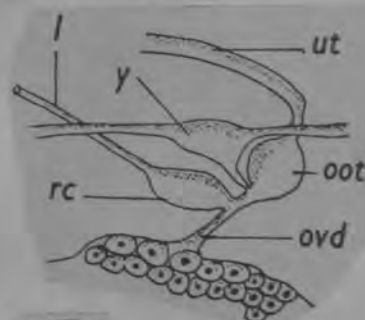
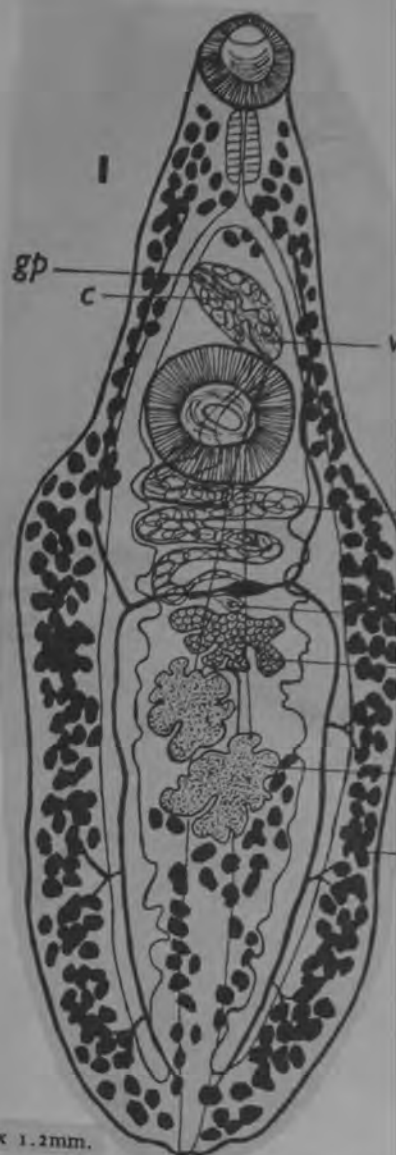
The vitellaria are well developed. The numerous and rather scattered medium-sized follicles extend from the pharynx region to the posterior end of the body. They also lie ventrally in the post-testicular space between the intestinal caeca. The vitelline ducts have the usual arrangement and there is a conspicuous yolk reservoir lying to the left of the median line.

The excretory bladder is tubular and extends to the level of the ovary.

The eggs (Figs. 3, 4), which are 0.06×0.03 mm are hollowed on each side. They do not have polar filaments.

DISCUSSION

The specimen belongs to the genus *Plagioporus* using Yamaguti's key (1958:98) and corresponds to the diagnosis for the genus (Stafford 1904); Manter (1947) discusses the similarity of the genera *Plagioporus*, *Podocotyle*, and *Hamacreadium*; the specimen described here is closer to *Plagioporus*. It also shows similarities to the genus *Helicometra* (Woolcock 1935) but the absence of filaments on the egg excludes it from this genus. Manter (1954) has described four new species of *Plagioporus* from New Zealand fishes; three are included in the subgenus *Plagioporus* and one in *Caudotestis*. *P. maorum* belongs to the sub-genus *Plagioporus*, and according to the key (Manter 1954) the lobed testes place it near the species *P. preporatus*. However, it differs from this species in the position of the genital pore, the median lobed ovary, and the diagonally placed testes.



The extent of the vitellarium is similar. It differs from *P. dactylopagri* in the more extensive post-testicular space and position of the genital pore, but it is similar in the extent of the vitellarium and the cirrus sac. The extent of the vitellarium, the smooth testes, large cirrus sac and position of the genital pore in *P. interruptus* again differ from *P. maorum*.

The size and the egg-size is greater in *P. maorum* than in any of the described New Zealand species.

The unusual position of *P. maorum* in the kidney coelom of *Octopus maorum* suggests a case of progenesis. Dawes (1946) records several cases of progenesis and Macfarlane (1939) describes the occurrence in *Coitocæcum anaspidis* but in these cases the progenetic form was present in the metacercarian cyst where the eggs had hatched to miracidia, but the testes were not producing sperm. (See also Buttner 1955). *P. maorum* was found free, not encysted, in the kidney coelom, the testes were mature and contained sperms, and the uterus was packed with developing eggs. The receptaculum seminis was also filled with sperms. All the organs of the octopus were examined carefully for metacercarian cysts but none was found. Cysts found on the wall of the intestine were tetraphyllid cestodes.

From these observations it does seem that this is an adult and not a progenetic form.

The following description is based on the examination of live material, stained whole mounts and sections. The first three specimens examined were obtained from formalin-preserved *Octopus maorum* during a class dissection when they were found in the mantle cavity. (The writer wishes to thank Mr. P. Johns for these first specimens.)

Subsequently three freshly killed *Octopus maorum* from Kaikoura were examined and two were infected. One contained fifty-two specimens of the trematode on the lobes of the kidney in the kidney coelom. The other, which was a much smaller specimen, contained six.

Plagioporus (Plagioporus) multilobatus Travassos, Freitas & Bührnheim, 1966 (Est. 7, figs. 18-22)

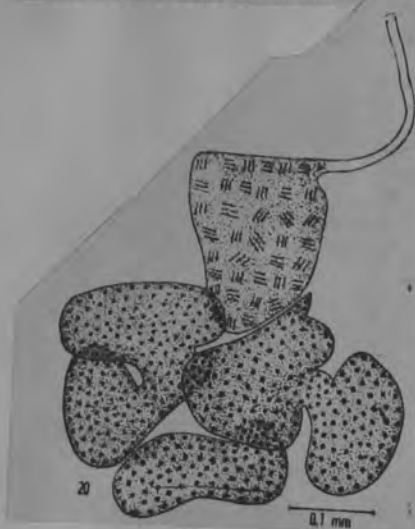
Plagioporus (Plagioporus) multilobatus Travassos, Freitas & Bührnheim, 1966: 35, 36-37, fig. 1

Trematódeos pequenos, com cutícula não espinhosa e extremidades arredondadas; medem 2,80 a 2,85 mm de comprimento por 1,47 a 1,52 mm de largura. Ventosa oral subterminal, com 0,21 a 0,24 mm de comprimento por 0,25 a 0,29 mm de largura. Acetábulo pré-equatorial, com 0,41 a 0,43 mm de comprimento por 0,41 a 0,44 mm de largura. Relação entre a ventosa oral e o acetábulo é de 1:1,64 (na descrição original, por erro tipográfico, encontra-se 1,44) a 1:1,77. Faringe presente, musculosa, com 0,160 mm de diâmetro. Esôfago curto. Cecos intestinais não sinuosos estendendo-se até a extremidade posterior do corpo. Poro genital deslocado lateralmente, na zona esofagiana, extracecal. Bólsa do cirro pré-acetabular, oblíqua, nas áreas intercecal, cecal e extracecal, com 0,426 mm de comprimento por 0,093 a 0,119 mm de largura; encerra vesícula seminal alongada e com uma curvatura sobre si mesma na região proximal, porção prostática e cirro. Testículos de contorno liso, pós-equatoriais, intercecais, com zonas parcialmente coincidentes e campos pouco afastados; um deles no campo ovariano e o outro invadindo parcialmente a zona do ovário. Testículo do campo ovariano com 0,27 a 0,32 mm de comprimento por 0,21 a 0,24 mm de largura; testículo oposto com 0,27 a 0,29 mm por 0,21 a 0,23 mm. Ovário pós-equatorial, intercecal, deslocado lateralmente, pré-testicular, no campo de um dos testículos e parcialmente na zona do outro; é profundamente trilobado, cada um dos lobos possuindo lobulações mais ou menos profundas; mede 0,29 mm de comprimento por 0,40 a 0,43 mm de largura. Glândula de Mehlis inaparente. Vitelodutos reunindo-se logo adiante do ovário. Espermateca presente, na zona ovariana ou em grande parte pré-ovariana, no campo dessa gônada; mede 0,183 a 0,200 mm de comprimento por 0,116 a 0,150 mm de largura. Canal de Laurer presente. Útero com alças pós-acetabulares e pré-ovarianas, ligando-se ao poro genital por uma vagina pouco diferenciada. Ovos operculados, amarelados, com pequena saliência no polo posterior; medem 0,063 a 0,073 mm de comprimento por 0,040 a 0,053 mm de largura. Vitelinos constituídos por folículos numerosos e bem desenvolvidos, extracecais, cecais e fracamente intercecais, estendendo-se da zona da faringe até a extremidade posterior do corpo, onde confluem na linha mediana, na área pós-testicular. Poro excretor terminal. Vesícula excretora estendendo-se até a zona testicular, porém não observada com maiores detalhes.

Habitat — Estômago e intestino de *Haemulon* sp.

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

Material estudado depositado na Coleção Helmintológica do Instituto Oswaldo Cruz sob os números 29 994 (tipo) e 29 995 (parátipo).



Plagioporus myoxocephalus Akhmerov, 1960Host: Myoxocephalus platycephalus

Locality: Amur River

7. *Plagioporus myoxocephalis* sp. n. (рис. 7). — Длина тела 1,6—2,0 мм, ширина 0,6—0,7 мм, кутикула гладкая. Брюшная присоска 0,34—0,4 × 0,4—0,42 мм крупнее ротовой 0,18—0,22 × 0,1—0,19 мм расположена под кишечной развилкой. Отношение длины брюшной и ротовой присосок равно 1,9—2,2 : 1, глотка 0,12 × 0,12—0,13 × 0,13 мм. Пищевод короткий — 0,12—0,15 мм. Отношение длины пищевода к длине глотки равно 1,08—1,1 : 1. Семенники овальные, почти одинаковых размеров: 1 — 0,1 × 0,22; 2 — 0,2—0,24 × 0,22—0,23 мм, отношение длины 2 семенника к 1 равно 1,3 : 1. Семенники между собой соприкасаются. Яичник нецельнокрайний, состоит из нескольких долей, расположен между семенником и брюшной присоской. Семяприемник небольшой граничат с яичником. Петли матки расположены перед передним семенником, не заходя на него. Яйца 0,08—0,085 × 0,042—0,045 мм, около 50 штук. Кишечные стволы слепо заканчиваются на заднем конце тела. Экскреторный пузырь достигает до заднего семенника. Желточные фолликулы расположены по обеим сторонам тела. Начинаясь у нижнего края глотки и сливается на заднем конце тела. Сумка цирруса открывается половым отверстием на уровне глотки и опускается до заднего края брюшной присоски в виде узкой, длинной изгибающейся трубки, содержащей семенной пузырек.

Хозяин и локализация: плоскоголовая широколобка (*Myoxocephalus platycephalus*), кишечник.

Экстенсивность и интенсивность паразитизма: найдено 3 экземпляра у 2 рыб из 25 исследованных.

Распространение: река Большая Писка (охотское побережье).

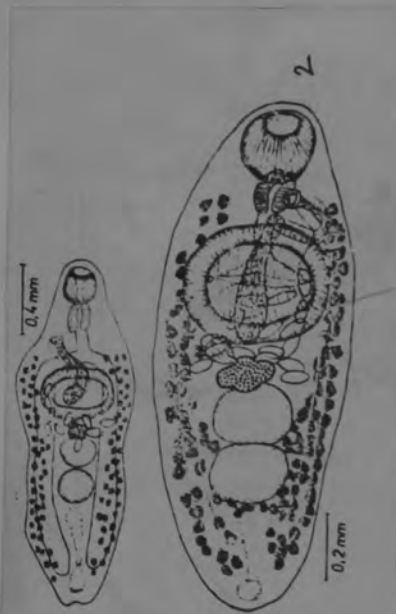


Рис. 7. *Plagioporus myoxocephalus* sp. n. А и В

PAPERNA, 1964

Plagioporus nemachili n.sp.
(Figure 30)

Host: *Nemachilus* sp. (in 1 out of 3 examined).
Habitat: intestine.
Locality: spring of Ein Harod (Beit Shean valley), Israel.
Holotype: No. 1841/Tr; *Paratype:* No. 1842/Tr.

Description (based on the examination of 5 specimens). Body length 0.7–1.0 mm, width 0.2–0.37 mm. Oral sucker 0.13–0.1 × 0.09–0.12 mm in size. Prepharynx absent. Pharynx 0.04–0.06 × 0.04–0.05 mm. Oesophagus 0.05–0.09 mm long. caeca reach the anterior edge of the posterior testis. Acetabulum 0.15–0.2 × 0.1–0.13 mm wide is situated at the level of the anterior third of the body. Cirrus pouch originates at the level of the acetabulum and opens on the right, or on the left side of the oesophagus, half way between the pharynx and the acetabulum. Vas deferens inside the cirrus pouch widens into a seminal vesicle. Prostatic gland is adjacent to seminal vesicle inside the cirrus pouch. Testes are in an oblique, almost tandem, arrangement at the posterior extremity of the body. Posterior testis is 0.08–0.15 × 0.12 mm while the anterior one is 0.1–0.13 × 0.11–0.06 mm. Ovary anterior to testes, 0.12 mm in diameter. Vitellaria are divided in large bunches and spread all over the body, from the pharynx to the posterior extremity of the body, and even reach the space between the testes. Eggs few, 0.6–0.7 mm long and 0.3–0.5 mm wide. Uterus winds in the area between the acetabulum and the anterior testis.

Discussion. Morphologically, this species closely resembles *P. angulatus* (Dujardin, 1845) Szidat, 1944, found in *Anguilla anguilla* in Poland. It differs, however, from the latter in size, and proportionally, in size of the oral sucker, the pharynx and the acetabulum. In our species the intestinal caeca reach only the level of the anterior edge of the posterior testis while in *P. angulatus* they reach the posterior edge of the body.



Plagioporus (Plagioporus) nicolli (Issaitschikoff, 1928) Price, 1934

(Рис. 161)

Синоним: *Lebouria (Caudotestis) nicolli* Issaitschikoff, 1928Хозяин: рыба — *Icelus bicornis*.

Локализация: желудок.

Место обнаружения: СССР (Карское море).

Описание вида (по Исайчикову, 1928). Мелкие трематоды с гладкой кутикулой достигают 1,80 мм длины и 0,632 мм максимальной ширины. Ротовая присоска почти круглая, 0,194 мм длины и 0,202 мм ширины. Круглая брюшная присоска 0,232 мм в диаметре, располагается на границе передней и средней третей длины тела. Имеется очень короткий префаринкс. Почти круглый фаринкс 0,128 мм длины и 0,132 мм ширины. Круглые или слегка овальные цельнокрайние семенники лежат в задней трети длины тела, слегка внаискось один позади другого. Передний семенник 0,113 мм в диаметре, а задний — 0,143 мм длины и 0,113 мм ширины. Половая бурса 0,128 мм длины. Яичник лежит впереди семенников, слегка вправо от медианной линии тела; она достигает 0,238 мм длины и 0,143 мм ширины. Небольшой семяприемник, 0,055 мм в диаметре, расположен слева от яичника. Половое отверстие лежит несколько вправо от медианной линии тела, непосредственно впереди брюшной присоски. Передняя граница желточников располагается на уровне заднего края фаринкса, а их задняя граница — на уровне середины заднего семенника. Матка лежит между семенниками и брюшной присоской, содержит около 30 яиц. Яйца 0,055—0,091 мм длины и 0,044—0,059 мм ширины.

Литература: Исайчиков, 1928, стр. 31—33.



not Plagioporus

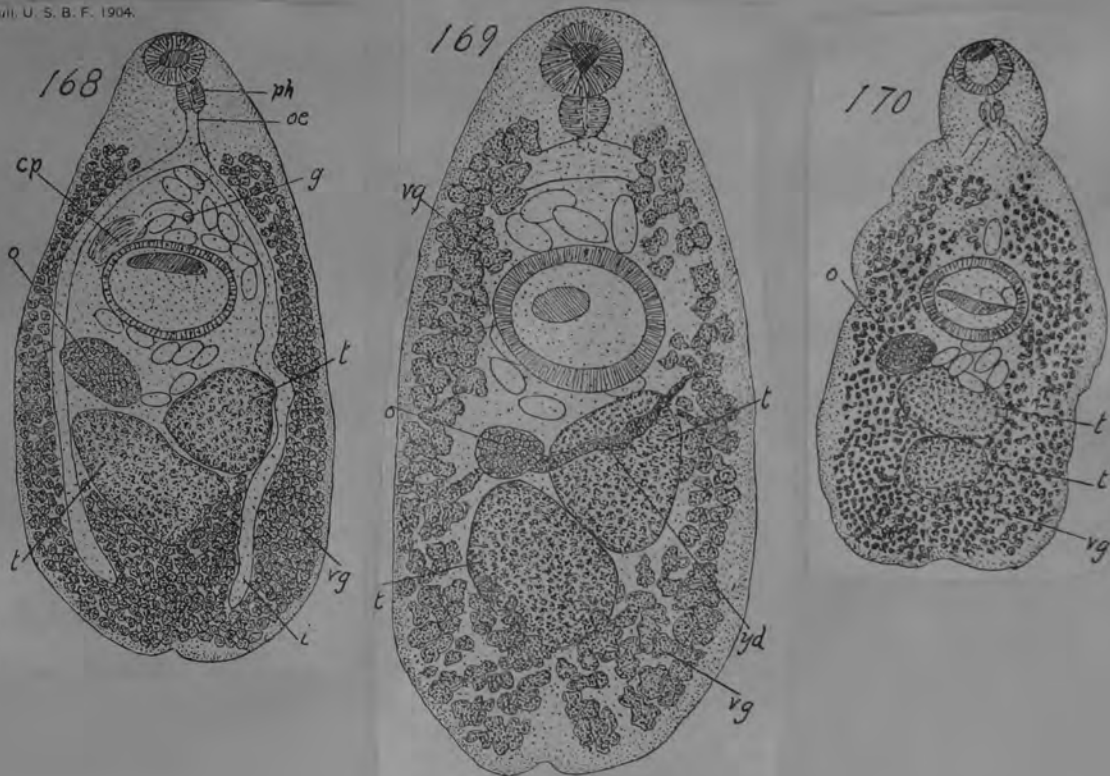
Plagioporus obducta (Nicoll, 1909) Price, 1934

Lebouria obducta Nicoll 1909

for Linton's 1904 :389 Distomum species from Bairdiella chrysur

"Length about 0.8 mm; breadth half length; oral sucker 0.12 mm., ventral sucker oval, a little in front of the body middle, 0.17 mm. (this is probably the short diameter, for in Linton's figures the transverse diameter is always at least twice that of the oral sucker). Pharynx 0.06 mm. esophagus short; genital aperture a little behind intestinal bifurcation, Testes much larger than those of Lebouria idonea, irregularly shaped, in posterior third of body. Cirrus sac short, extending a little beyond the anterior border of the ventral sucker. Ovary transversely oval, on a level with anterior testis or a little in front, on the right side. Yolk glands only reaching intestinal bifurcation, not uniting in front but filling up space behind testes. Ova few (5 to 20) measuring 63 by 35 u."

Bull. U. S. B. F. 1904.



Is this Hermetisma?
same as?

Miller (1940) says this species cannot be retained in the genus Plagioporus because of its median genital pore. He does not place it in any other genera.

Plagioporus occidentalis Szidat, 1944

Host: Gobio occidentalis

Length 1.6 mm.; width 0.33 mm.

Oral sucker 0.15 by 0.17

Acetabulum only a litter larger, 0.17 by 0.2

Pharynx 0.07 ~~te-e-~~ wide 0.09 long

Esophagus narrow about 0.15 long

Ceca small reaching almost to posterior end

Gonads round, unlobed, in line one behind the other

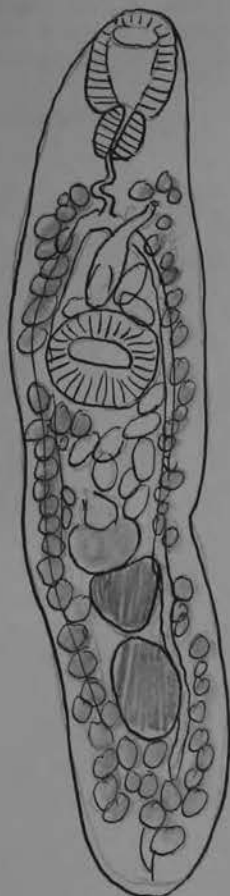
Uterus preovarian; eggs 35 to 70 μ

Sem. rec. large, over the anterior part of ovary

Vitellaria rather large and extend forward the
space between pharynx and bifurcation.

Cirrus sac well developed reaching just over the anterior
edge of acetabulum

Not compared directly with other species but said to
be most like P. virens and P. silicus.



Plagioporus pacificus Yamaguti, 1938

Length: 1.1-1.75 mm.

Width: 0.32-0.45 mm at level of acetabulum.

Oral sucker: 96-150 μ in diameter.

Acetabulum (size): 0.18-0.26 mm in diameter.

(position): Pre-equatorial or at posterior end of anterior third of body.

Sucker ratio: Acetabulum much larger.

Esophagus: Short, bifurcating about midway between two suckers.

Pharynx: 60-90X70-90 μ

Genital pore (location): Sinistral, level with pharynx or immediately behind it.

Testes, shape: Subglobular to oval, anterior broader than long, posterior longer than broad.

location: Tandem, ant. at junct. of post. with mid. third of body.

Cirrus es.: (extent): To middle of acetabulum.

Ovary, shape: Subglobular, usually broader than long.

location: Median or somewhat dextral, directly in front of anterior testis.

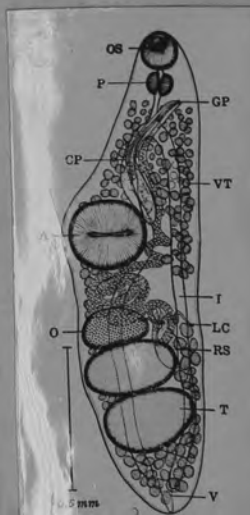
Vitellaria: From level of pharynx or behind it, continuous in median line in dorsal part of forebody and behind posterior testis.

Eggs: Elongate oval, 24-30X16-18 μ .

Other features:

Host: Neopercis multifasciata (Döderlein) N. muronis TanakaN. aurantiaca (Döderlein)

Locality: Pacific Ocean, off shores of Japan.

Reference: Studies on the Helminth Fauna of Japan. Part 21.
Kyoto, Japan. Revised editionComparisons: P. isaitschikowi (Layman, 1930)
P. choerodontis (Yamaguti, 1934)

SYNONYM: *Podocotyle pennelli* Leiper and Atkinson, 1914.

DESCRIPTION (Based on 30 specimens, measurements on 10): Length 1.12 to 2.07; greatest width at level of acetabulum, 0.31 to 0.49; body tapering at both ends, more broadly rounded at anterior end than at posterior end. Oral sucker 0.11 to 0.17 in transverse diameter, 0.11 to 0.17 long; acetabulum broader than long, 0.26 to 0.44 in transverse diameter, 0.22 to 0.38 long; sucker ratio 1:2.0 to 1:2.75. Forebody 0.27 to 0.35. Short prepharynx, 0.01 to 0.04; pharynx 0.06 to 0.11 long by 0.06 to 0.10 wide; esophagus usually somewhat shorter than pharynx; bifurcation at anterior margin of acetabulum, usually overlaps acetabulum; intestinal ceca extend to rear margin of posterior testes or sometimes slightly beyond.

Testes smooth, tandem, sometimes slightly oblique; anterior testis 0.20 to 0.22 long by 0.22 to 0.24 wide; posterior testis 0.22 to 0.24 long by 0.22 to 0.23 wide; testes in contact with each other, anterior testis in contact with ovary; anterior testis just posterior to mid-body. Genital pore opens to left, opposite pharynx. Cirrus sac claviform, extending somewhat diagonally backward, dorsal to acetabulum. Cirrus sac extends backward to mid-acetabular level or slightly beyond. Seminal vesicle simple, claviform, in posterior half of cirrus sac; seminal vesicle usually entirely dorsal to acetabulum. Pars prostatica slightly enlarged, surrounded by large gland cells; weakly developed cirrus, surrounded by a few gland cells. Vitelline follicles large, extending from posterior edge of pharynx to posterior extremity of body; interrupted slightly in some specimens opposite acetabulum; dorsal and lateral to ceca; confluent dorsally anterior to acetabulum and above ovary and both testes, usually filling post-testicular space. Ovary post-acetabular, pre-testicular, 0.19 to 0.23 by 0.18 to 0.21. Uterus largely pre-ovarian, extending posteriorly to margin of anterior testis. Eggs 46 to 62 by 24 to 33, usually 55 to 62 by 24 to 26.

Excretory pore terminal; excretory vesicle tubular, extending forward to level of ovary.

HOSTS: *Trematomus bernacchii* Boulenger, in 8 of 9 hosts; *Trematomus hansonii* Boulenger, in 2 of 6 hosts; *Trematomus centronotus* Regan, in 3 of 10 hosts; and in a new species and genus of fish in the Family Zoarcidae*, in 2 of 14 hosts.

LOCATION: Upper and lower intestine.

SPECIMENS DEPOSITED: U. S. National Museum Helminthological Collection Number 59818.

DISCUSSION: Leiper and Atkinson (1914, 1915) listed and later described a new species, *Podocotyle pennelli* from *Trematomus bernacchii* from Antarctic waters. According to their description, the ceca of their specimens end at the level of the posterior limit of the testes; the ovary is pear-shaped to slightly lobate; the vitellaria range from the level of the genital pore to the posterior extremity; there is an armed cirrus present; and the eggs have a distinct knob-like protrusion at one end. These are characters typical of *Plagioporus* and for this reason *Podocotyle pennelli* is transferred to this genus and the new combination becomes *Plagioporus pennelli* (Leiper and Atkinson, 1914). Although the original description of *P. pennelli* is incomplete, the figure is somewhat more detailed. The re-description above is based

on 30 specimens which agree with the description and with Figure 19 by Leiper and Atkinson (1915).

Manter (1954) recognizes two subgenera, *Plagioporus* and *Caudotestis*, in *Plagioporus*. Species in *Caudotestis* have intestinal ceca which do not extend beyond the posterior limit of the testes whereas species in *Plagioporus* have ceca which extend beyond the testes. Leiper and Atkinson's description of *P. pennelli* states that ceca terminate at the end of the posterior testis. Their figure shows ceca which end slightly behind the posterior testis. In my Antarctic specimens, this character is somewhat variable. In some specimens, the ceca end at the rear margin of the posterior testis and in others they end more posteriorly. On the basis of this character, *P. pennelli* should be placed in the Subgenus *Plagioporus*.

Manter (1954) presented a key to the 27 species in the Subgenus *Plagioporus*. Of the species considered in the key, *P. japonicus* Yamaguti, 1938 and *P. isaitschikowi* (Layman, 1930) Price, 1934 seem most closely related to *P. pennelli*. *P. pennelli* differs from *P. japonicus* in possessing somewhat smaller eggs and exhibiting a straight instead of looped seminal vesicle. *P. pennelli* also differs in having a cirrus sac which extends nearly to the posterior margin of the acetabulum instead of one which terminates anterior to the acetabulum. *P. pennelli* differs from *P. isaitschikowi* in its more posterior intestinal bifurcation and continuous vitellaria opposite acetabulum. *P. pennelli* further differs from *P. isaitschikowi* in the extent of the cirrus pouch which extends nearly to the posterior margin of the acetabulum as compared with one which extends anterior to the acetabulum.

From: Proc. Helm. Soc. Wash. 30: 133-134



Familia Opecoeliidae OZAKI 1925
Género Plagioporus STAFFORD 1904

1. *Plagioporus pennelli* (LEIPER y ATKINSON) SZIDAT (fig. 1), que en *Notothenia neglecta* habita los apéndices pilóricos y el intestino anterior, solo apareció en número reducido. Los trematodes del género *Plagioporus* usan generalmente anfibios como hospedadores secundarios, los cuales pueden ser ocasionalmente comidos por peces predadores aunque no constituyan su alimentación principal. Esto explica el número reducido de este trematode en el intestino de *Parachaenichthys*.

From Szidat and Graefe, 1967



BIRD (1963) MADE THE
COMBINATION.

0,5 mm

PLAGIOPORUS PENNELLI (Leiper and Atkinson) Byrd

Podocotyle pennelli Leiper and Atkinson, 1914, 224.

Plagioporus pennelli (Leiper and Atkinson) Byrd, 1963, 133.

Hosts and localities: *Trematomus centronotus* — A.A.E., 66°50'S, 142°6'E; *Trematomus eulepidotus* — Stn. 107; *Trematomus newnesi* — Stn. 106; *Trematomus nicolai* — A.A.E., 64°44'S, 97°28'E; *Trematomus pennellii* — A.A.E., 64°32'S, 97°20'E; *Cryodraco antarcticus* — A.A.E., 65°42'S, 92°10'E.

This species was originally described as *Podocotyle pennelli* from *Trematomus bernacchii* in the vicinity of Cape Evans in 77°38'S, 166°24'E. Later, Byrd (1963) referred the species to the genus *Plagioporus* and redescribed it from *Trematomus bernacchii*, *T. hansonii*, *T. centronotus* and a new form of zoarcid fish, all caught at 77°51'S, 166°38'E. More recently, Szidat (1965) recorded the worm from *Notothenia neglecta* in the Melchior Archipelago, and later Szidat and Graefe (1967) recorded it from *Parachaenichthys charcoti* taken off Half Moon Island, South Shetlands. On the present evidence it appears that *Plagioporus pennelli* is a common parasite of varying kinds of fishes and is widely distributed in Antarctic and sub-Antarctic waters, but there is as yet no evidence that its range extends into Australian, New Zealand or South American waters.

There are several specimens of this species in the present collection, but all are much contracted, consequently the length of the body is distinctly less, and the width greater, than hitherto recorded. The length of mature worms varies from 0.6 mm to 1.2 mm and the maximum width, which occurs in the region of the ventral sucker, from 0.38 mm to 0.8 mm. From its widest part the body tends to taper towards both extremities. As in previously-described specimens of this species, each of the present worms has a large ventral sucker, but its position is more central, owing to contraction of the body. It is transversely oval, and the transverse diameter varies from 0.34 mm to 0.47 mm. The oral sucker is subterminal and ranges from 0.13–0.20 mm in transverse diameter, and its ratio with the ventral sucker in this diameter is similar to that found by Byrd (1963) 1:2–2.8. The oral sucker opens into a well-developed pharynx, which is longer than wide and varies between 0.078 × 0.055 mm and 0.11 × 0.08 mm. Owing to the contraction of the forebody of the worm, the prepharynx and oesophagus are exceedingly short, or not apparent.

The genital pore is situated to the left of the median line in the region of the pharynx. The cirrus-sac is elongate, extending to near the hinder margin of the ventral sucker. The cirrus-sac is often very difficult to detect in shrunken specimens, and this appears to be due to its thin muscular wall being obscured by the investing vitelline follicles.

The testes have smooth margins and in every instance they are arranged diagonally one behind the other, the left testis being the foremost. The ovary also has smooth margins and is situated to the right of the median line on the same level or slightly anteriorly to the left testis. The distribution of the vitellaria is precisely as that described by Byrd. The uterine coils are disposed in front of the testes. The eggs measure 52–60 μm × 27–32 μm. Those lying in the distal region of the uterus are often provided with a small, but distinct, boss at the anopercular pole.

Prudhoe and Bray, 1973

From Szidat, 1965

Plagioporus pennelli (LEIPER y ATKINSON) n. comb.

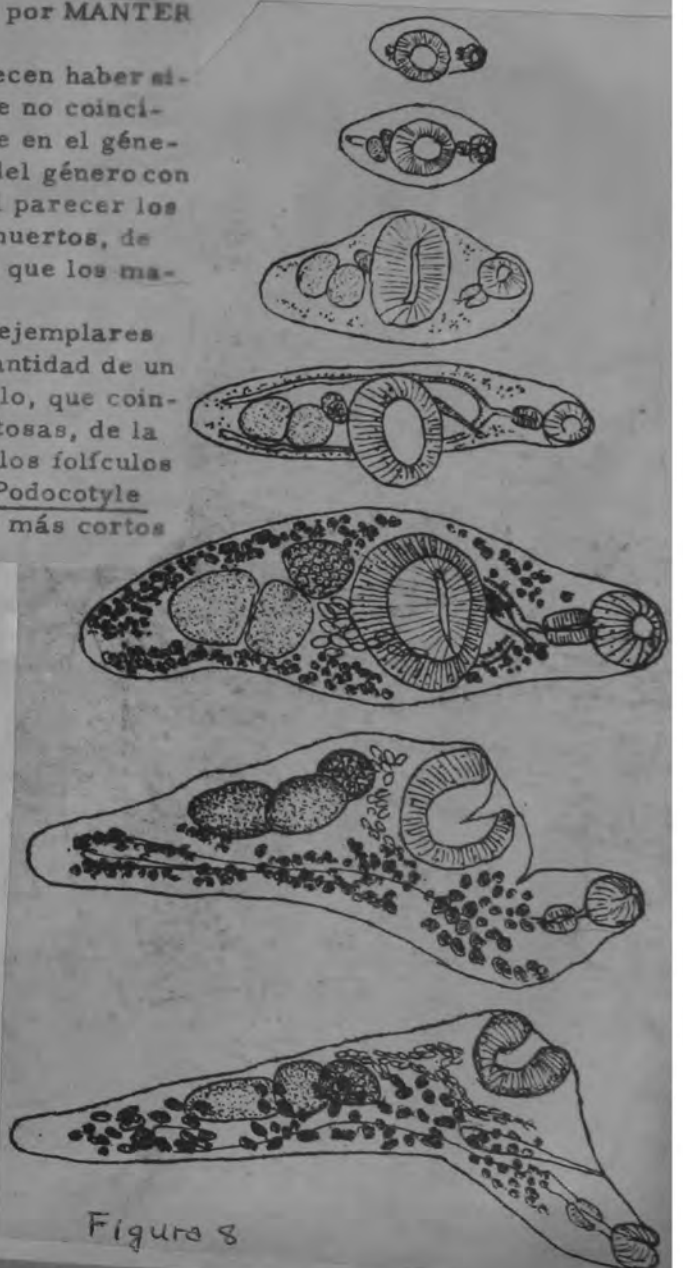
ACTUALLY, BIRD MADE COMBINATION IN 1963.

HAROLD W. MANTER (1954), en su trabajo "Some digenetic trematodes from fishes of New Zealand", estudia todas las especies del género Plagioporus STAFFORD 1904. Sólo P. isaitschikowi (LAYMAN) PRICE, 1934, muestra una interrupción de la banda de folículos vitelógenos a la altura de la enorme ventosa ventral. Esa especie fue hallada en la bahía de Pedro el Grande en el Pacífico norte, e incluida por PRICE (1934) en el género Plagioporus.

En su revisión de los vermes parásitos de la British Antarctic (Terra Nova) Expedition, 1910, LEIPER y ATKINSON (1915) describen entre otros helmintos un trematode del intestino de Trematomus bernacchii, un pez de la familia Nototheniidae. Lo incluyeron en el género Podocotyle DUJARDIN, 1845, lo que ya fue objetado por MANTER (1954).

A juzgar por las ilustraciones, que parecen haber sido hechas a mano libre, y que en buena parte no coinciden con el texto, esta especie debía incluirse en el género Plagioporus, y sería la segunda especie del género con interrupción de las bandas del vitelógeno. Al parecer los autores sólo dispusieron de ejemplares ya muertos, de los que se sabe que tienen medidas mayores que los matados con técnicas de laboratorio.

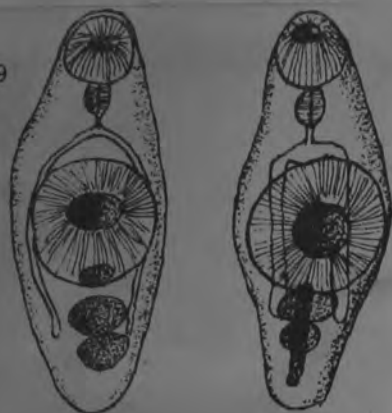
En los apéndices pilóricos de todos los ejemplares de Notothenia neglecta siempre hallé gran cantidad de un trematode, en todos los estadios de desarrollo, que coincide bien en cuanto a las medidas de las ventosas, de la faringe, de los huevos y a la distribución de los folículos vitelógenos y posición del poro genital, con Podocotyle pennelli LEIPER y ATKINSON, pero que son más cortos



- over -

Figuras 8

FIGURA 9



que esa especie. Por su anatomía pertenecen claramente al género Plagioporus STAFFORD, y no sería imposible que también fuera idéntica P. isaitschikowi LAYMAN, lo que permitiría concluir una distribución bipolar, ya observada con frecuencia. En mi trabajo sobre los parásitos del róbalo (Eleginops maclovinus, un nototénido) señalé que casi todos presentaban relaciones muy estrechas con los mares árticos, pero lamentablemente no dispuse del trabajo de LAYMAN para efectuar comparaciones más precisas. -

Doy a continuación las medidas obtenidas sobre material bien fijado: largo 1,0-1,3 mm. (según LEIPER Y ATKINSON, en el texto, 2,4-2,6 mm., medido sobre la figura sólo 1,9mm); la ventosa bucal mide 0,16 mm (0,15-0,18mm); la ventosa ventral es muy musculosa y mide 0,28-0,32 mm (0,3 mm); la faringe mide 0,1 mm (0,09mm) y los grandes huevos 0,06 x 0,035 mm (0,06x0,04 mm).

Tanto en P. pennelli, según sus autores (fig.8) como en mi material (fig. 8) el poro genital está desplazado a la izquierda, aproximadamente a mitad de distancia entre ambas ventosas. -

Los vitelógenos llegan por arriba hasta el borde inferior de la faringe, y presentan la interrupción característica a la altura de la ventosa ventral, lo mismo que en P. isaitschikowi LAYMAN. Considero pues a mi material como idéntico al de LEIPER Y ATKINSON.

Es importante aclarar que entre los abundantes ejemplares juveniles hallados en los apéndices pilóricos, algunos muestran gran semejanza con una segunda especie descrita por LEIPER Y ATKINSON, Allocreadium fowleri. (Fig. 9). Sin embargo el material utilizado por esos autores era demasiado inmaduro como para justificar su descripción como especie nueva (fig.9). En esta descripción las medidas dadas en el texto tampoco coinciden con las que surgen de la figura. Considero pues que los trematodes descritos como Allocreadium fowleri por ambos autores, son sólo estadios juveniles de Plagioporus pennelli. -

Especie: Plagioporus penelli (LEIPER Y ATKINSON, 1915) SZIDAT, n. comb.

Hospedador: Notothenia neglecta NYBELIN

Ubicación: apéndices pilóricos.

Distribución: Bahía Scotia, isla Laurie, Orcadas del sur, y archipiélago Melchior.

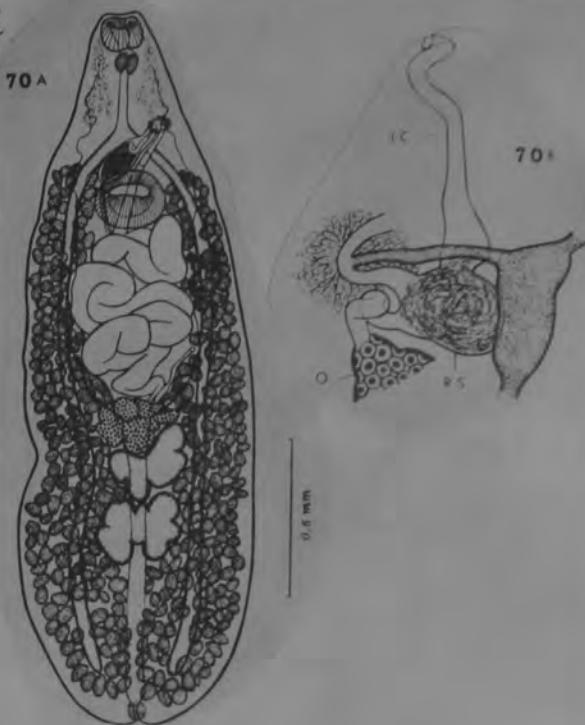
106. *Plagioporus (Plagioporus) polymixiae* ~~n. sp.~~ Yamaguti,
1970
(Fig. 70)

HABITAT: Intestine of *Polymixia japonica*; Hawaii.
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63584.
DESCRIPTION (based on 55 whole mounts): **Body** lanceolate or elongate pyriform, flattened, 1.5-3.4 mm in length, with maximum width of 0.3-0.9 mm at level of testes or uterus; forebody abruptly tapered anteriorly, hindbody nearly uniform in width and broadly rounded at posterior extremity. Oral sucker subterminal, 0.09-0.22 × 0.11-0.21 mm; prepharynx distinct; pharynx 50-100 × 60-110 μ; esophagus 0.1-0.3 mm long; ceca terminating near posterior extremity. Acetabulum 0.15-0.26 × 0.15-0.3 mm, situated in posterior half of anterior third of body.

Testes irregularly lobed, with conspicuous incisions on anterior and posterior margins 0.08-0.25 × 0.14-0.31 mm, directly tandem, situated at about middle of hindbody or a little more posteriorly. Cirrus pouch claviform, 0.2-0.4 × 0.05-0.1 mm, extending obliquely from dorsal side or anterior margin of acetabulum to genital pore; seminal vesicle tubular or saccular; its attenuated anterior portion turning back on itself and leading into cylindrical pars prostatica; ejaculatory duct bipartite; proximal portion wider and more muscular than distal, lined with transversely folded cuticle; distal portion smooth inside, narrow. Genital pore at varying levels, to left of esophagus.

Ovary irregularly multilobed, 0.07-0.25 × 0.16-0.38 mm, equatorial or postequatorial, immediately in front of anterior testis, with its center a little to right of median line. Germiduct twisted, running transversely immediately in front of ovary, turns forward as it joins the small seminal receptacle, and then unites with the vitelline duct; Laurer's canal arising directly from this small seminal receptacle, running obliquely forward, opening dorsal or just medial to left cecum. Main bulk of uterus intercecal, between ovary and acetabulum; metraterm alongside cirrus pouch; eggs oval, 54-70 × 30-42 μ in life. Vitellaria commencing at level of anterior end of acetabulum, leaving anteriormost portion of intestine free, reaching cecal end, separated by excretory vesicle behind posterior testis. Excretory vesicle reaching to posterior end of ovary where it gives off a pair of collecting vessels; excretory pore opening at terminal notch.

DISCUSSION: This species differs from the known members of the genus in the seminal receptacle being so much reduced that it can hardly be detected. It is worth noting that the ovary and testes are very irregularly lobed.



26. *Plagioporus preporatus* *Manter, 1954*
(Fig. 34)

HOST: *Chelidonichthys kumu* (Lesson and Garnot), gurnard; intestine.
LOCALITY: Portobello.

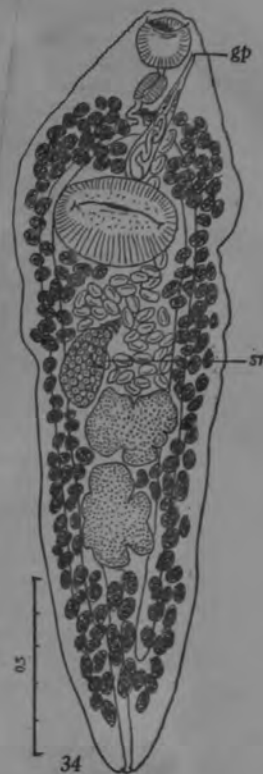
HOLOTYPE: U.S. Nat. Mus. Helminth. Collection No. 49130.

DESCRIPTION (based on one specimen): Length 2.100 mm.; width 0.630 mm. at level of acetabulum; body tapering toward each end, almost pointed posteriorly. Oral sucker 0.160 mm. wide; acetabulum wider than long, 0.369 mm. wide. Sucker ratio 1 : 2.3. Forebody 0.447 mm. Short prepharynx; pharynx 0.106 mm. long by 0.076 mm. wide; oesophagus about same length as pharynx; bifurcation about midway between suckers; caeca extending past testes but ending some distance (about 0.350 mm.) from posterior end of body.

Testes tandem, lobed, close together; anterior testis just posterior to midbody. Genital pore to the left, far forward, at a level just posterior to middle of oral sucker. Cirrus sac almost straight, claviform, extending diagonally backward to the mid-anterior edge of the acetabulum. Seminal vesicle tubular, somewhat coiled, in posterior half of cirrus sac. Cirrus weakly developed, with a few gland cells. Ovary unlobed, longer than wide, extending diagonally backward to overlap the right side of anterior testis. Seminal receptacle dorsal to anterior half of ovary. Vitelline follicles large, from posterior edge of pharynx to within a short distance of posterior end of body; continuous; dorsal, lateral, and ventral to caeca; confluent dorsally and almost so ventrally anterior to acetabulum. Uterus partly to left of ovary, mostly preovarian; eggs 76 by 42 μ . Excretory pore terminal; excretory vesicle can be traced only to the posterior testis.

The name *preporatus* is for the far forward location of the genital pore.

DISCUSSION: This species differs from all the others in the genus *Plagioporus* in having the genital pore opposite the oral sucker. It is probably most like *P. japonicus* Yamaguti, 1938 but the genital pore is more anterior, the testes tandem and more lobed. From *P. branchiostegi* Yamaguti, 1937 it differs in the same respects and in that the cirrus sac does not overlap the acetabulum. *P. lobatus* (Yamaguti, 1934) is reported from *Chelidonichthys kumu* in Japan. It



differs in having a lobed ovary and a genital pore well posterior to the oral sucker.

Plagioporus is a very large genus and will be discussed below.

107. *Plagioporus (Plagioporus) rooseveltiac* n. sp. Yam., 1970
(Fig. 71)

HABITAT: Intestine and pyloric ceca of *Rooseveltiac brighami*; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63585.

DESCRIPTION (based on 16 flattened whole mounts): Body plump, 3.0-4.7 mm long, up to 0.75-1.4 mm wide at level of ovariotesticular region; forebody blunt-conical, hindbody nearly cylindrical, broadly rounded at posterior extremity, which is distinctly notched at median excretory pore. Oral sucker ventroterminal, 0.17-0.34 X 0.24-0.4 mm; prepharynx wide, with compact mass of gland cells on each side, may be extended up to 60 μ long. Pharynx strongly muscular, 0.1-0.17 X 0.14-0.25 mm, esophagus 0.2-0.42 mm long, bifurcating about halfway between pharynx and acetabulum; ceca terminating at a distance of 0.25-0.55 mm from posterior extremity. Acetabulum 0.45-0.65 mm in diameter, situated at junction of anterior with middle third of body.

Testes ovoid, 0.19-0.4 X 0.13-0.32 mm, obliquely tandem, at about middle of hindbody, each giving off vas efferens at its anterior end. Cirrus pouch claviform,

0.85-1.2 X 0.09-0.18 mm, extending more or less back of acetabulum; seminal vesicle elongate saccular, 0.2-0.42 X 0.1-0.13 mm, produced anteriorly into a narrow tubule which is clearly constricted off from the pars prostatica; pars prostatica subcylindrical, 0.15 X 0.05 mm in the type; cirrus eversible. Genital pore submedian, a little to left of intestinal bifurcation.

Ovary primarily three- or four-lobed, 0.2-0.3 X 0.17-0.35 mm, situated anteromedial to anterior testis, each lobe usually subdivided. Receptaculum seminis retort-shaped, up to 0.2 mm wide, dorsal or dorsosinistral to ovary. Laurer's canal arising from seminal receptacle as direct continuation of latter, but its dorsal opening could not be detected in the type. In one paratype, however, the Laurer's canal winds its way forward and opens almost middorsally 0.13 mm behind the acetabulum. Uterus winding in intercecal field between ovary and acetabulum; metraterm running straight forward from midlevel of acetabulum, provided with inner longitudinal and outer circular muscle fibers, and a sphincter at its distal end. Eggs oval, 55-70 X 39-46 μ , without polar filament. Vitellaria consisting of small acini of different shape, circumcecal, commencing at level of anterior end of acetabulum; vitelline reservoir immediately anterodorsal to ovary. Excretory vesicle tubular, reaching to ovary, opening into median sinus at posterior extremity.

DISCUSSION: This species closely resembles *Plagioporus ula-ula* n. sp. from *Etelis marshi*, but differs from it in the anterior extent of the vitellaria and in the length of the Laurer's canal. In *P. ula-ula* this canal opens dorsal to the posterior end of the acetabulum, but in the present species it opens some distance posterior to the acetabulum.



Peracreadium (?)

Opecoelidae

~~Allocreadidae~~

new genus *Lepocreadiidae*

Plagioporus serratus sp. nov.

(Fig. 1)

Host: *Hyodon tergisus* (moon-eye)

Members of this species occur in the gall bladder of their host. They are very small, somewhat spindle-shaped flukes, tapering rather abruptly at the posterior tip and narrowing out to a broad neck at the anterior end. The cuticula is characteristically extended to form conspicuous broad-based spines, which cover the entire body. Mature specimens measure from 0.41 to 0.51 mm. in length by 0.14 to 0.18 mm. in width at the widest point, which is usually the region of the acetabulum. The oral sucker is terminal, subspherical and measures from 0.076 to 0.080 mm. in diameter. The acetabulum is situated about the middle of the body. It is subspherical and somewhat larger than the oral sucker, measuring from 0.09 to 0.11 mm. in diameter. There is no obvious pre-pharynx. The pharynx is prominent and is about half as long as the diameter of the oral sucker. The oesophagus is from once to twice the length of the pharynx. The broad intestinal crura extend to within a short distance of the posterior extremity. The testes are obliquely arranged near the posterior tip of the body; the posterior testis is on the mid-line and the anterior testis is immediately to the left of it. They are approximately spherical in outline with smooth edges, and measure from 0.042 to 0.046 mm. in diameter. The ovary is ovate in outline with the long axis in the lateral plane; it is larger than the testes and is situated on the mid-line partly overlapping the anterior testis. The vitellaria extend laterally from the posterior end of the pharynx to the posterior testis. The uterus passes anteriorly to the genital pore situated on the left side of the body slightly

... as a separate genus and n
... a synonym of *Plagioporus*.

Mueller (8) stated that Stafford's species *P. serotinus* could not be re-
because it was not recognizable. However, the type specimen has
recovered. Furthermore, in the intestines of the red horse and co
sucker have been found additional specimens which differ only in tha
are of a larger size in the former host.



Not Plagioporus

From Miller

Paracreadium (?)

Opecoelidae
~~Allocreadiidae~~

Podocotyle shawi McIntosh, 1939

McIntosh, 1947

Length: 4.1 , slightly constricted at equator.

Width: 1.1

Oral sucker: 0.310 by 0.250 (with rasp-like scales ?)

Acetabulum: (size:) 0.500 by 0.450 , preequatorial
(position):

Sucker ratio:

Esophagus: 0.400 long

Pharynx: 0.200 in diameter; prepharynx 0.150 by 0.150

Genital pore (location): laterally , midway to edge, opposite
posterior third of esophagus.

Testes, shape: ovoid to spherical; tandem and contiguous

location: posterior half of body

Cirrus sac (extent): 1.7 by 0.100, extending to near ovary.

Ovary, shape: lobed cirrus spined.

location: median or lateral, pretesticular

Vitellaria: from bifurcation to beyond cecal tips, interrupted
usually at basal level of acetabulum.

Eggs: 78 by 55 μ

Other features:

Host: Oncorhynchus kisutch (Walbaum) silver salmon

Locality: Alsea River, Oregon

Reference: Jour. Wash. Acad. Sci., 29:379-381

Comparisons:

Life cycle:

Listed as Allocreadium
(subgenus Paracreadium) shawi
(McIntosh, 1939) by Yamaguti,
1953

Listed as Coinocreadium shawi by Yam. (1952)

(over for complete description)

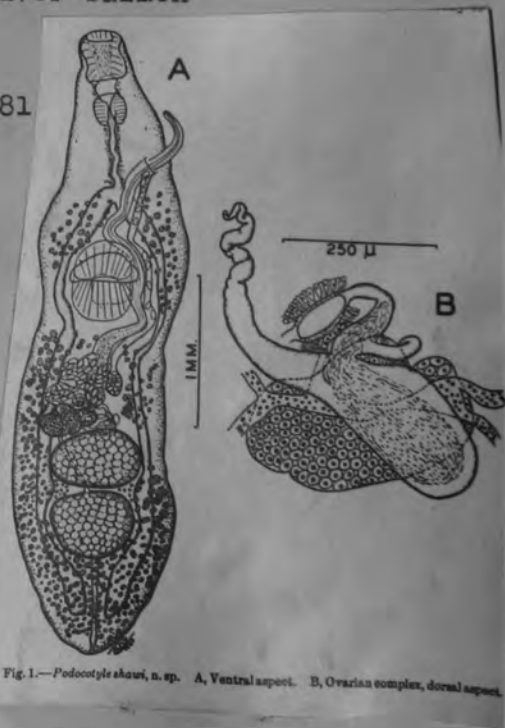


Fig. 1.—*Podocotyle shawi*, n. sp. A, Ventral aspect. B, Ovarian complex, dorsal aspect.

The species described in this paper is based on 5 specimens that were recently forwarded for identification to the Bureau of Animal Industry by Dr. J. N. Shaw, Oregon State Agricultural College, Corvallis, Oreg. This species belongs to the genus *Podocotyle*, but since it does not appear to agree with any known member of the genus, it is regarded as new and is described below.

Podocotyle shawi, n. sp. McIntosh, 1939

Description.—Body elongated, 4.1 mm long by about 1.1 mm wide, slightly constricted at equator, broadest at region of testes, anterior end more attenuated than posterior end; cuticula without spines. Oral sucker terminal, 310 μ by 250 μ ; cuticula of inner wall of oral sucker appearing as if provided with rasplike scales. Acetabulum pre-equatorial, 500 μ by 150 μ . Prepharynx about 150 μ by 150 μ ; pharynx 200 μ in diameter; esophagus 400 μ by 50 μ ; intestinal crura ending near posterior end of body. Excretory pore at posterior end of body, opening into an elongated bladder. Testes from ovoid to almost spherical in outline, tandem and contiguous, situated in posterior half of body; anterior testis 380 μ by 600 μ , posterior testis 450 μ by 550 μ . Cirrus sac 1.7 mm long by about 100 μ wide, extending along median line from near region of ovary, bending to pass acetabulum laterally to area between acetabulum and cecal fork and then continuing diagonally to genital pore; cirrus spiny, protruding in type specimen beyond body margin. Genital pore located laterally about halfway between median line and margin of body in zone of posterior third of esophagus. Ovary lobed, 200 μ by 380 μ , median or lateral in position, pretesticular. Seminal receptacle dorsal to ovary, about 150 to 300 μ ; Laurer's canal extending anteriorly from large seminal receptacle. Vitellaria extending from level of intestinal fork to beyond cecal tips, usually with an interruption at basal level of acetabulum. Uterus between ovary and acetabulum, consisting of few coils. Metaterm elongated, to left of cirrus sac. Eggs about 78 μ by 55 μ , yellowish brown.

Habitat.—Intestine of silver salmon, *Oncorhynchus kisutch* (Walbaum).

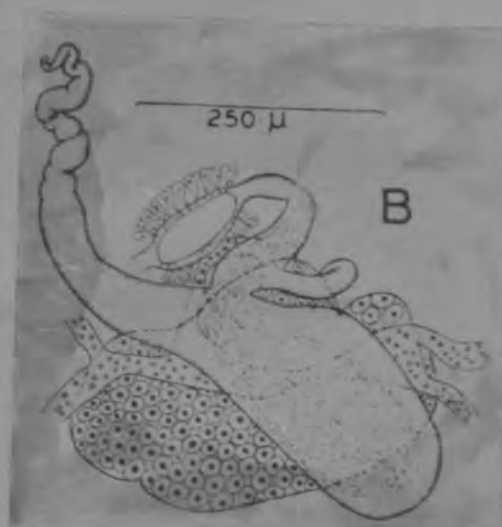
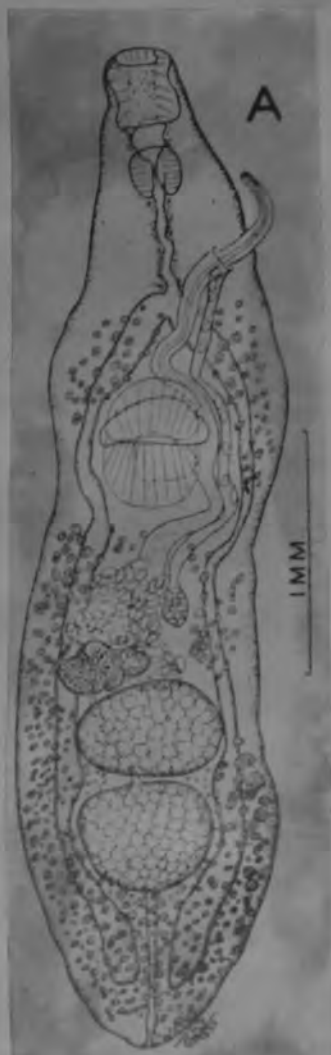
Distribution.—Alsea River, Oregon, U. S. A.

Specimens.—U. S. N. M. Helm. Coll. nos. 43427 (type) and 43428 (paratypes).

Remarks.—In addition to the type specimens from *Oncorhynchus kisutch* there are several specimens in the Helminthological Collection of the Bureau of Animal Industry from the cutthroat trout (*Salmo clarkii* Richardson) and the steelhead trout (*Salmo gairdnerii* Richardson) that appear to be identical with the specimens on which the new species is based; these specimens were also collected by Dr. Shaw from the same locality.

Podocotyle shawi differs from most of the other members of the genus in that the vitellaria on each side extend in front of the acetabulum to the level of the cecal fork. In a few species of the genus *Podocotyle*, namely, *P. atomon* var. *dispar* Nicoll, 1919, *P. lanceolata* Price, 1934, and *P. pennelli* Leiper and Atkinson, 1914, some few vitelline follicles, usually only on the right side, are present in front of the acetabulum; however, in these three species the cirrus sac is short in comparison with the elongated cirrus sac of *P. shawi*.

Recent contributions to our knowledge of the genus *Podocotyle* are to be found in papers by Price, 1934 (Smithsonian Misc. Coll. 91: 1-8); McFarland, 1936 (Journ. Biol. Board Canada 2: 335-347); and Park, 1937 (Journ. Parasit. 23: 405-422). In the last-named paper a key to the species of the genus *Podocotyle* is given.



Plagioporus shawi (McIntosh, 1939) Margolis, 1972

Based on examination of 54 specimens. Measurements are from 13 whole mounts in Canada balsam of mature specimens killed *in situ* by freezing and are in mm except for eggs which are in μ . The specimens measured were selected to include the smallest and largest.

Body length 2.77-5.25; maximum width 0.88-1.46. (Immature specimens, i.e., without eggs, measured 2.19-2.40 by 0.73-0.80.)

Oral sucker length 0.26-0.47; width 0.26-0.40. Prepharynx length 0.036-0.071. Pharynx length 0.13-0.25; width 0.15-0.24. Esophagus length 0.18-0.53. Caecal bifurcation about mid-way between pharynx and acetabulum. Caeca lateral, terminating near posterior end of body. Acetabulum anterior to mid-body, circular, or transversely or longitudinally oval in outline, 0.37-0.62 in length by 0.42-0.66 in width. Ratio of transverse diameters of suckers 1:1.29-1:1.76.

Genital pore to left of posterior portion of esophagus, about mid-way between mid-line and left body margin. Cirrus sac 1.34-2.98 in length by 0.067-0.20 in maximum diameter near its posterior end; may reach posteriorly as far as ovary and always reaching more than one-half distance between acetabulum and ovary; postacetabular portion usually sinuous, occasionally straight (in 4 of 54 whole mounts studied), remaining portion straight or slightly curved. Cirrus non-spinous, up to 1.53 in length when everted. Seminal vesicle long, occupying approximately posterior two-thirds to three-quarters of cirrus sac when cirrus everted, about 1.0-2.0; divided into two portions, of which anterior is more slender and longer than posterior and possesses a thicker wall (Fig. 2); division between two portions of seminal vesicle usually in postacetabular part of cirrus sac, occasionally slightly anterior to posterior margin of acetabulum; posterior portion may or may not be constricted or folded back on itself at one or two places along its length; anterior por-

tion sometimes sinuous near its proximal end; sperm more densely packed in posterior than anterior portion, resulting in posterior portion staining more intensely; anterior portion surrounded by prostatic cells. No distinct pars prostatica.

Testes occupying approximately middle third of hindbody, tandem, contiguous. Frequently lobed to some extent, sometimes smooth with oval outline; lobation usually more pronounced in posterior testis; anterior testis 0.18-0.39 in length by 0.31-0.71 in width, posterior 0.22-0.50 by 0.22-0.71.

Ovary variable in shape, usually three- to five-lobed, occasionally with as many as eight lobes, contiguous to or slightly overlapping anterior testis, median or dextral to mid-line of body. Seminal receptacle large, ovoid to pyriform, dorsal or dorsosinistral to ovary, base may or may not overlap anterior testis. Laurer's canal opening dorsally and sublaterally on left side of body, about one-third to one-half distance between ovary and acetabulum.

Vitellaria circumcaecal, extending from near posterior extremity to, or almost to, caecal bifurcation on each side, frequently interrupted in acetabular zone; extent and location of vitellaria-free zone variable and may include entire acetabular zone, but more commonly only a portion of the acetabular zone with or without a small postacetabular zone; occasionally (in 2 of 19 mature specimens examined) preacetabular vitellaria absent on left side; in posttesticular region vitellaria of both sides meet medially.

Uterus pretesticular. Eggs 62-83 by 36-57.

Excretory pore terminal; excretory vesicle tubular, dorsal to testes, reaching to ovary.

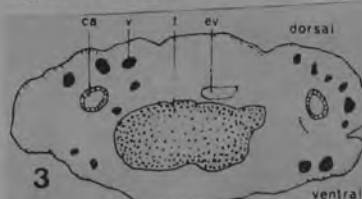
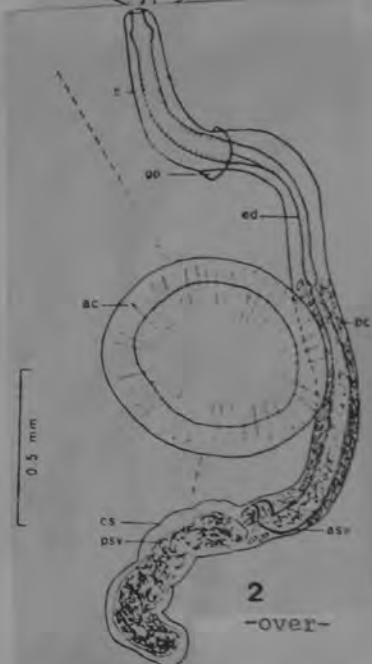
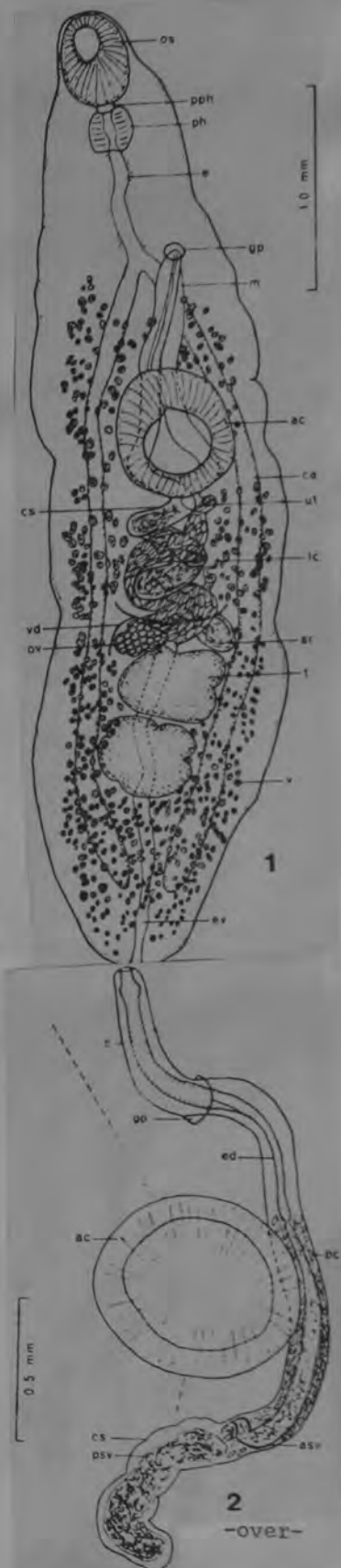


Fig. 3. Transverse section at level of anterior region of anterior testis.
Fig. 4. Transverse section at level of posterior region of ovary.



McIntosh (1939) described the cirrus as spinous but there is no evidence of spines in the specimens I examined, including the holotype. This absence of spines on the cirrus is not the result of loss due to possible maceration in the "freeze-killed" specimens, since none were observed in the specimens collected alive and killed and fixed immediately. Pratt and McCauley (1961) also failed to detect spines on the cirrus of *P. shawi*.

The anterior extent of the excretory vesicle was not mentioned by McIntosh (1939). His figure 1A shows only post-testicular portion of the vesicle which, it seems, led Yamaguti (1954, 1958) to believe that it did not reach anterior to the posterior border of the posterior testis. That the excretory vesicle reaches to the ovary is clearly evident in some whole mounts I examined and has been verified by study of serial transverse sections of an entire specimen (Fig. 3, 4).

The testes were described as "ovoid to almost spherical" by McIntosh, but in the specimens examined in the present study they frequently showed some degree of lobation or indentation.

The anterior portion of the seminal vesicle is probably the structure which Park (1937) called an ejaculatory seminal vesicle in several species of *Podocotyle*.

Systematics

Mantel (1947) was the first to remark that *P. shawi* should be excluded from *Podocotyle*, but he did not assign it to any other genus. He considered the presence of preacetabular vitellaria, the very long cirrus sac, and the spined cirrus (as described by McIntosh, 1939) to be at

variance with the concept of *Podocotyle* and felt that the long cirrus sac suggested affinities with *Pericercadium*.

Yamaguti (1951) transferred *P. shawi* to *Pericercadium*, which he reduced to a subgenus of *Allocreadium*, and later he (Yamaguti, 1958) placed it in *Cainocercadium*, of which *Pericercadium* was considered a synonym. Winter (1959) referred the species to *Pericercadium*, giving the latter full generic status. These generic allocations of *P. shawi* are not acceptable because in *Allocreadium*, *Pericercadium* and *Cainocercadium* the genital pore is median and the excretory vesicle does not extend anterior to the testes, whereas in *P. shawi* the genital pore is distinctly sinistral, lying about mid-way between the mid-line and the left body margin, and the excretory vesicle extends to the ovary. Schell (1970)

retained the species in *Cainocercadium*, broadening the limits of this genus to include species with a sinistral genital pore.

In compiling a list of parasites of North Pacific salmonids, Fukui (1958) followed Yamaguti (1954) in listing this parasite as *Allocreadium shawi* (McIntosh, 1939) on page 615, but he listed it as *Podocotyle shawi* on page 617. In a later paper (Fukui, 1961, pp. 4, 8, 9) he again listed this species under both names.

In their reviews of *Podocotyle*, neither Skrjabin and Koval (1958) nor Pritchard (1966) mentioned *P. shawi*.

Since the cirrus in *P. shawi* is actually non-spinous, it is evident from its other anatomical features that it belongs to the *Podocotyle-Plagioporus* complex. The characters on which to base a separation of these two genera have been cause for concern for a number of years. When few species were known the dis-

tinguishing seemed clear. The absence of preacetabular vitellaria, the presence of a lobed ovary, and a cirrus sac extending into the postacetabular region characterized *Podocotyle* (see Odhner, 1905), whereas the presence of preacetabular vitellaria, a smooth ovary, and a cirrus sac not extending beyond the acetabulum were features of *Plagioporus setotinus*, the type species of its genus (Stafford, 1904). Dawes (1946, 1947) used these combinations of characters in a key to separate British representatives of *Plagioporus* and *Podocotyle*, although he (Dawes, 1947) recognized that in one British species of *Podocotyle*, *P. synnathii* Nicoll, 1913, the cirrus sac did not reach beyond the acetabulum. Hoffman (1967) used the same key to separate these genera, as represented in North American freshwater fishes, but he accepted *P. shawi* as a member of *Podocotyle* despite its preacetabular vitellaria.

As more and more species of *Plagioporus* and *Podocotyle* were described, various combinations of the three original distinguishing characters were uncovered. This presumably led Yamaguti (1954, 1958) and Skrjabin and Koval (1958) to resort to using a single character to separate the two genera, namely the presence of preacetabular vitellaria in *Plagioporus* and their absence in *Podocotyle*. As a practical means of assigning species to one or the other genus this proposal generally has been accepted.¹ Thus, because of its preacetabular vitellaria, *Podocotyle shawi* is renamed

Plagioporus shawi (McIntosh, 1939) n. comb. The termination of the caeca posterior to the testes places it in the subgenus *Plagioporus* (see Mantel, 1951).

In transferring *Podocotyle shawi* to *Plagioporus* it becomes the only species

¹ Pritchard (1966) recently partitioned the genus *Podocotyle*, distributing its species among five genera, all of which lack preacetabular vitellaria.

of this genus that has both a lobed ovary and a cirrus sac reaching posterior to the acetabulum. A lobed ovary occurs in about one-quarter of the approximately 65 species currently recognized as members of *Plagioporus*, but in only seven species, including *P. shawi*, does the cirrus sac extend behind the acetabulum. Thus the extension of the cirrus sac into the postacetabular region may be considered the character least typical of *Plagioporus*. The six previously known species possessing this character are *P. angusticollis* (Hausmann, 1896) Dobrovolsky, 1939; *P. synnathii* Yamaguti, 1952; *P. longicirratus* Mantel, 1963; *P. longisaccus* Fischthal and Kuntz, 1964; *P. pontica* Koval, 1966; and *P. gerridis* Fischthal and Thomas, 1970. *Plagioporus trematichthys* (Vaz, 1932) Yamaguti, 1958 also has a cirrus sac extending into the postacetabular region, but $\frac{1}{2}$ median genital pore and apparently papillose oral sucker (Vaz, 1932) do not support Yamaguti's (1958) decision to assign this species to *Plagioporus*. Two other unnamed species assigned to *Plagioporus* by their describers (Shulman and Shulman-Albova, 1953; Ichihara *et al.*, 1965) have the cirrus sac extending into the postacetabular region. However in both species preacetabular vitellaria are lacking; therefore they should be excluded from *Plagioporus*. Because of their smooth ovaries, they apparently belong to the group of species for which Pritchard (1966) created the genus *Allopodocotyle*.

Distinguishing between *Podocotyle* and *Plagioporus* solely on the basis of vitellarian distribution is not as clear-cut as one would like. The extension of the vitellaria into the forebody in some individuals of the type species of *Podocotyle*, *P. atomon* (Rudolphi, 1802), has been reported by Odhner (1905), Nicoll (1909), Savina (1927), Shulman-Albova

(1952).² and Polyansky (1955).³ Nicoll (1909) even created for his specimens a separate variety, *P. atomon* var. *dispar*, based on the presence of a separate preacetabular group of vitellaria on the right side. Also, in *P. lanceolata* Price, 1934 and *P. endophrysi* Park, 1937 a few vitellarian follicles on the right side of the body occur immediately anterior to the acetabulum.

The variability ascribed to *P. atomon* tends to discredit the value of preacetabular vitellaria as the distinguishing feature of *Plagioporus*, nevertheless the remaining approximately 110 species in the *Plagioporus-Podocotyle* complex can be readily segregated into two groups based on presence or absence of this character. Perhaps on further study better grounds will be found for generic segregation within this large group of species but at the moment it seems convenient to accept the consistent presence of preacetabular vitellaria as the identifying character of *Plagioporus*. Mehra's (1966) proposal, as indicated in his key to the genera of Plagioporinae, to differentiate *Podocotyle* from a number of other genera including *Plagioporus* by the presence of a short acetabular peduncle compared to absence of a peduncle requires further examination.

Host and Geographical Distribution

Plagioporus shawi is known only from salmonoid fishes from northwestern U.S.A. (Oregon, Washington and Idaho) and most likely does not occur outside this area. Reported hosts are *Oncorhynchus kisutch*, *O. nerka*, *O. nerka kennerlyi* (kokanee, a land-locked form of the sockeye salmon), *Salmo clarki*, *Salmo gairdneri*, *Prosopium williamsoni*, and *P. williamsoni cismontanus* (McIntosh, 1939; Shaw, 1947; Griffith, 1953; Friets, 1959; Pratt and McCauley, 1961; Weatherly and Canaris, 1961).

² MacKenzie and Gibson (1970) implied that *atomon* may not be as variable a species as believed by Shulman-Albova (1952) and others. ³ Pritchard (1966) stated that the three specimens figured by Polyansky (1955) do not agree with the diagnosis of *Podocotyle* and she doubted that they were even conspecific. She made no reference to the work of Shulman-Albova (1952) on the variability of *P. atomon*.

Source of Infections in Adult Sockeye Salmon

Previous records of *P. shawi* from such strictly freshwater salmonoids as *P. williamsoni* and *O. nerka kennerlyi* dictate that this trematode has a freshwater life cycle, precluding the possibility of fish becoming infected at sea. Like some other freshwater parasites (Polyansky, 1958) *P. shawi* may also be able to complete its life cycle in waters of low salinity such as may be encountered in estuaries.

The trematodes observed in adult sockeye salmon may represent a carry-over of infections acquired by the young salmon during their first year of life prior to leaving fresh water for the sea (sockeye salmon have a very strongly expressed homing instinct, returning to the spawning grounds of their birth) or they may represent new infections acquired by the adult fish after re-entry into fresh water.

The following evidence favours the latter alternative. First, *P. shawi* was not found in any of 145 seaward migrant sockeye salmon examined from northwestern USA watersheds, including 73 from the Columbia River system, and secondly, immature and young adult *P. shawi* were found in the Columbia River adult sockeye salmon, indicating recent infections.

The life cycle of *P. shawi*, although unknown, presumably involves two intermediate hosts, the first being as in almost all other trematodes a mollusc

and the second also an invertebrate, probably an aquatic arthropod. Infection of the salmonoid host occurs when second intermediate hosts harbouring the metacercariae are eaten. This implies that contrary to generally accepted opinion (Foerster, 1968), some sockeye salmon may feed after entering rivers on

their spawning migration, at least in the lower reaches of the rivers. Other parasitological evidence, namely the presence of the freshwater trematode *Crepidostomum furiosum* in an adult sockeye salmon taken in a stream, was previously used (Margolis, 1965) to arrive at a similar conclusion.

TABLE I
INCIDENCE AND INTENSITY OF INFECTION OF *PLAGIOPRION* SHAWI (MCINTOSH, 1939) N. COMB. IN ADULT SOCKEYE SALMON FROM THE COLUMBIA AND QUINULT RIVERS

	Date collected	No. examined	Incidence no.	Incidence %	Intensity range	Intensity mean *
Columbia River						
	Celilo Falls	26-VII-1955	25	12	48	1-23 4.7
	Astoria, Oregon	28-VI-1956	25	12	48	1-7 3.6
	Bonneville Dam	11-VII-1957	25	21	84	1-31 9.6
	Astoria, Oregon	22 to 28-VI-1958	23	7	30	1-2 1.4
	Astoria, Oregon	24-VI-1959	25	2	8	1-4 2.5
	Quinault R., Washington	30-V-1957	17	3	18	1 1

* Based on infected fish.

MATERIAL AND METHODS

The infected fish were all caught in the lower reaches of the Columbia and Quinault rivers during their upstream spawning migration after having spent approximately two years at sea. There were three collection sites on the Columbia River (Table I). Celilo Falls, inundated in 1957 by a hydroelectric dam development, is about 180 miles (290 km) from the mouth of the river; Bonneville Dam is about 140 miles (225 km) from the mouth; and Astoria is near the mouth. The samples obtained at Astoria were from landings from a commercial fishery operating between the mouth of the river and Bonneville Dam. The exact locations of catch of the Astoria samples are unknown.

The trematodes collected in the survey were killed *in situ* by freezing the host fish which were transported to the Nainimo Biological Station in the frozen state. After retrieval from the thawed

fish, the parasites were fixed in 10% commercial formalin (i.e., ca. 4% formaldehyde) and later transferred through water and a graded series of alcohols to 70% ethanol in which they were stored.

In addition to the material collected from frozen salmon, the holotype and four freshly fixed specimens collected from an adult Columbia River sockeye salmon were also examined. The latter were alive when removed from the host and were immediately killed and fixed in Bouin's fluid, \times under slight pressure and two by dropping into hot fixative.

Whole specimens were stained with Gower's alum \times carmine or Delafield's haematoxylin and mounted in Canada balsam. Serial transverse sections of one specimen were cut at 10 μ and stained with Delafield's haematoxylin and eosin. All figures were drawn with the aid of a camera lucida.

From Margolis, 1972

Plagioporus silliculus
~~sinistinus~~ Sinistin, 1931

Length 2.5; width 0.57
 Oral sucker 0.17 across
 Acetabulum 0.3.
 Short prepharynx; pharynx 0.12
 Esophagus about same length as pharynx
 Ceca begin about halfway between suckers and reach to
 posterior end of body
 Excretory bladder reaching to the anterior testis
 Testes and ovary tandem; close together; unlobed.
 Ovary with half spherical compartment filled with ripe eggs
 Genital pore at level of bifurcation to the left.
 Uterus preovarian. Vitellaria extend to bifurcation
 Eggs 58 by 42 u
 Cirrus sac not quite reaching acetabulum

Host: freshwater fishes; Salmo clarki
 near Corvallis, Oregon

Cotylocercous cercariae develop in Goniabasis plicifera plicifera
 Metacercariae in muscles of Potamobius



Fig. 3. Plagioporus silliculus Sin. Matthe. From
 the ventral side. Abg albumin gland, Abc acetylcholine,
 Ac acetabulum, Al alveoli, An anterior sucker, C
 ceca, Ex excretory bladder, Lc lateral canal, O ovary,
 P pharynx, Pr prepharynx, R receptaculum seminis, T
 testes, U uterus.

Plagioporus sillagonis Yamaguti, 1938

Length: 2.1-2.3 mm

Width: 0.9 mm

Oral sucker: 0.16-0.18 mm in diameter, with anteroventral opening

Acetabulum (size): 0.25-0.28 mm in diameter

(position): At junction of anterior with middle third of body

Sucker ratio: Acetabulum larger

Esophagus: Nearly as long as oral sucker

Pharynx: 81-87 μ long by 87 μ broad

Genital pore (location): Sinistral, level with esophagus

Testes, shape: Transversely elongated, with more or less marked concavity on anterior surface

location: Tandem, in median line, at about middle of hindbody.

Cirrus sac (extent): To middle of acetabulum

Ovary, shape: Rounded

location: Directly in front of right end of anterior testis.

Vitellaria: Beginning at posterior part of esophagus, occupying all available space behind posterior testis.

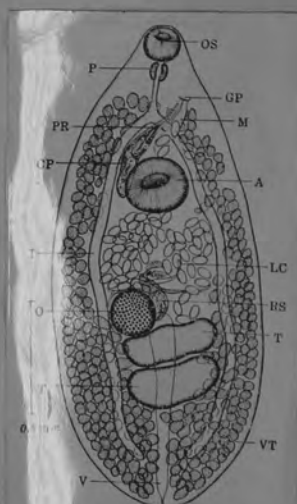
Eggs: Elliptical, light brown, thick-shelled, 75-81X42-45 μ in life

Other features:

*whiting?*Host: Sillago sihama (Forsk.)*Is this a freshwater fish*

Locality: Lake Hamana, Japan

Reference: Studies on Helminth Fauna of Japan Part 21. Kyoto, Japan Revised edition

Comparisons: Plagioporus isaitschikowi (Layman, 1930)Fig. 1. Plagioporus sillagonis: ventral view.

немногочисленны (от 2-3 до 50). Их размеры 0,070 - 0,050 - 0,030 X 0,038 мм.

Plagioporus (Plagioporus) skrjabini Koval, 1951

(Рис. 170)

Синоним: *Plagioporus* sp. I Koval, 1950

Хозяева: бычок-головач (*Neogobius kessleri*), сом (*Silurus glanis*).

Локализация: кишечник.

Место обнаружения: СССР (река Днепр).

Историческая справка. Этот вид был описан Коваль в 1950 году из кишечника *Neogobius kessleri* реки Днепра под названием *Plagioporus* sp. I. В 1951 году Маркевич в своей книге «Паразитофауна пресноводных рыб СССР» описывает его как *Plagioporus skrjabini* Koval, 1951. В 1952 и 1955 года Коваль дает подробное описание своего вида с учетом изменчивости его морфологических признаков. Изучив мировую литературу по роду *Plagioporus*, Коваль пишет, что «взаиморасположение половых желез в этом роде считается одним из наиболее главных диагностических признаков при определении видов. Однако, при установлении новых видов на единичных экземплярах, этот признак не может служить надежным диагностическим признаком, так как у одного и того же вида, как мы убедились на примере *Plagioporus skrjabini* (см. ниже),

яичник может лежать как рядом с передним семенником, так и впереди него. Однако при просмотре большого количества особей нашего вида прослеживается в глаза характерное для них расположение гонад, проявляющееся у большинства особей (с яичником, лежащим рядом с передним семенником, справа от него). То же самое можно сказать и о положении циррусного мешка, заднюю границу которого нельзя строго фиксировать» (Коваль, 1952, диссертация).

Описание вида (по Коваль, 1950). Форма тела удлинённая или овальная. Длина тела достигает 0,68—1,42 мм, ширина — 0,22—0,41 мм. Кутикула гладкая. Пищевод сравнительно короткий, длина его в значительной степени связана с сокращением переднего конца тела. Фаринкс имеет в длину 0,032—0,040 мм при ширине — 0,048—0,060 мм. Размеры ротовой присоски 0,057 × 0,076 — 0,114 × 0,123 мм. Брюшная присоска почти вдвое больше ротовой; ее размеры 0,095 × 0,114 — 0,190 × 0,199 мм. Кишечные ветви заходят в задний конец тела, достигая заднего края заднего семенника. Форма половых желез может быть от круглой до овальной. Семенники сдвинуты к заднему концу тела и обычно почти прилегают друг к другу. Задний семенник располагается медианно, передний немного смещен влево. Размеры семенников: 0,095 × 0,114—0,171 × 0,190 мм. Яичник располагается с правой стороны тела, как правило, рядом с передним семенником; реже яичник лежит впереди переднего семенника. Просмотр наших препаратов показал наличие разных степеней перехода от типичного для вида расположения половых желез, с яичником, лежащим рядом с передним семенником, к расположению гонад друг над другом, с яичником, лежащим вправо от медианной линии тела. Характер взаиморасположения желез сказывается уже при их закладке. Половая бурса состоит из более широкой задней части, в которой располагается семенной пузырек, и более узкой дистальной части с циррусом, семяизвергательным каналом и простатическими железами. Положение половой бурсы у *P. skrjabini* подвержено значительным колебаниям и зависит от степени сокращения переднего конца тела. При нормально вытянутом переднем конце тела половая бурса лежит наискось; ее широкая часть огибает брюшную присоску слева, достигая сзади ее центра, а спереди открываясь половым отверстием между фаринксом и бифуркацией кишечника, на левой стороне тела. При сильно сокращенном переднем конце тела половая бурса иногда ложится полностью впереди брюшной присоски, располагаясь в поперечном направлении, или простирается назад, за центр брюшной присоски. Между описанными положениями половой бурсы существует ряд переходов. Желточники могут начинаться на уровне фаринкса и на уровне бифуркации кишечника, но никогда не начинаются ниже. Желточные фолликулы идут в латеральных полях, встречаясь по медианной линии тела впереди брюшной присоски, вклиниваются между семенниками. Обычно позади семенников в заднем конце тела желточные фолликулы одного ствола заходят на сторону противоположного. Эти случаи, при которых оба ствола фактически не сливаются, нужно отличать от настоящего слияния желточников, имеющего место у ряда видов рода *Plagioporus*. Петли матки расположены в пространстве между передним семенником и брюшной присоской. Яйца немногочисленны (от 2—3 до 30). Их размеры 0,076 — 0,038—0,085 × 0,038 мм.



170

Cauda testis?

Plagioporus sp.

(Pl. 34, c, d)

312

Plagioporus

Host.—*Salmo gairdneri*, in intestine.

In the course of a detailed study of the variations in the morphology of *Crepidostomum farionis* occurring in the intestine of rainbow trout, a few flukes were found which do not have oral papillae and thus do not belong to the genus *Crepidostomum*. These flukes, represented by five mounted specimens in my collection were all found, together with many specimens of *Crepidostomum farionis*, in the intestine of a single trout 11 cm. long, taken from a tributary of the Klamath River in Siskiyou County.

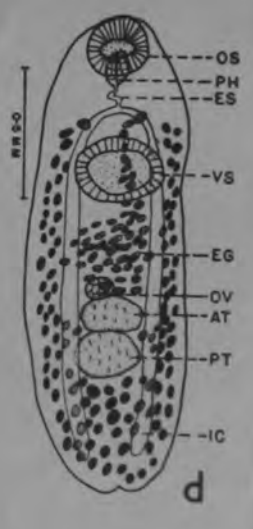
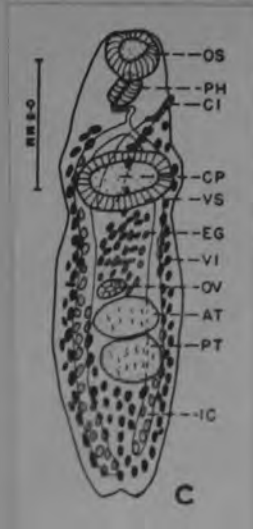
These trematodes possess all the characteristics of the genus *Plagioporus* given by Dobrovoly (1939). However, they cannot be accommodated in any of the species previously described. The worms differ from *Plagioporus angusticauda* in the size and shape of the gonads and the size and shape of the acetabulum. In general over-all size, and in the size and shape of the acetabulum and ovary, they resemble *Plagioporus fusiformis* as described by Price (1934) from a marine fish. However, in the position of the acetabulum and extent of the vitellaria they do not agree with *P. fusiformis*.

The trematodes probably represent an undescribed species. However, having only five specimens in my collection and realizing the extreme variation that occurs in flukes of this family, I do not feel that there is enough material to make an accurate determination of a new species. The flukes are of rare occurrence in the rainbow trout of California, having been found in only one of the ninety-one specimens examined. Until more specimens can be collected the fluke must remain identified only to genus.

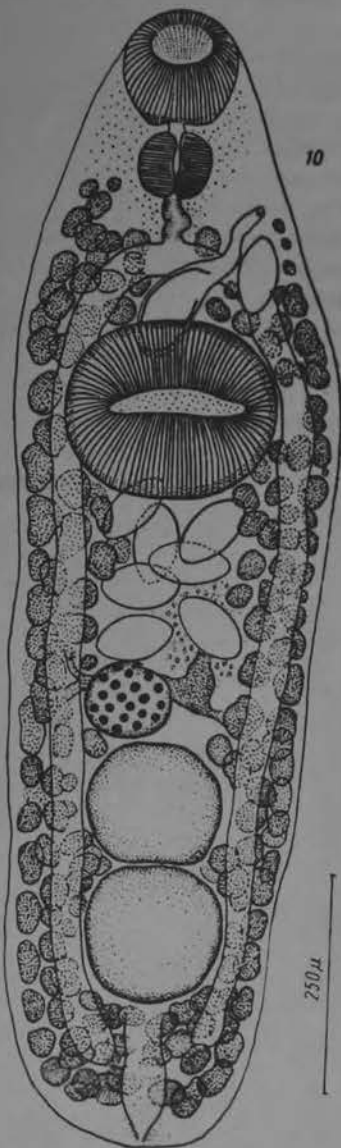
All five of the worms were measured in arriving at the average dimensions given below.

The worms average 1.68 (1.23–1.96) mm. long and 0.52 (0.41–0.66) mm. wide. The oral sucker is terminal, and on the ventral side; it averages 0.20 (0.18–0.22) mm. in diameter. A short prepharynx is visible on some specimens. The pharynx is well developed with muscular bulb 0.10 (0.09–0.11) mm. in diameter. The esophagus is fairly long and tortuous, often swelling into a bulb at the posterior end. The caecal bifurcation is slightly anterior and dorsal to the ventral sucker. The crura are of unequal length and run to near the posterior end of the worm. The ventral sucker is large and muscular, often elongated transversely and extending across the width of the worm; its average maximum diameter is 0.32 (0.28–0.35) mm. The vitellaria extend from the posterior end to the acetabulum; sometimes there are a few follicles anterior to the acetabulum. The follicles are in lateral rows but arch up dorsally and fill in solidly the posttesticular field. The testes are pressed together, often flattened on one side, and average 0.19

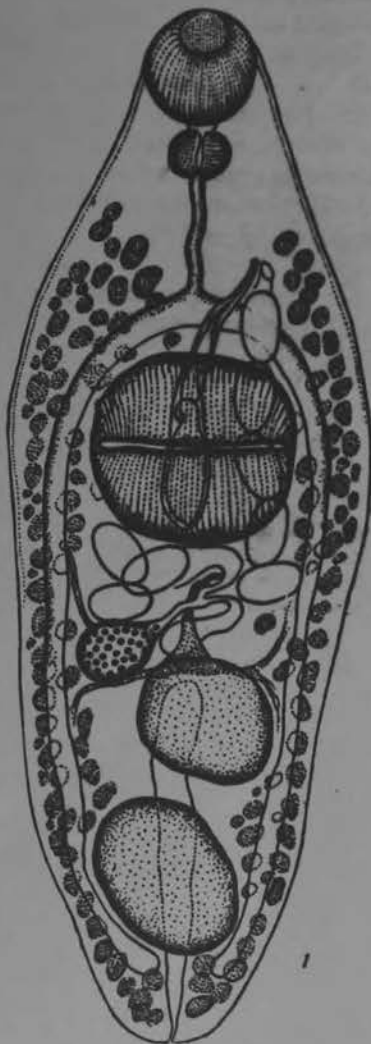
0.25) mm. in diameter. The ovary, sometimes trilobed, averages 0.18 mm. in diameter and is just anterior to the testes and slightly lateral. The uterus is limited to the field between the anterior testis and the acetabulum, and is filled with as many as one hundred yellowish eggs which vary from 0.059 to 0.063 mm. in length and from 0.035 to 0.039 mm. in width. The genital pore is at the level and to the left of the intestinal bifurcation. The cirrus is everted on several specimens and measures 0.14 mm. long by 0.035 mm. in diameter. The cirrus is not spinous. The posterior extent of the cirrus sac is near the posterior margin of the acetabulum, sometimes slightly posterior to the acetabular margin.



Haderlie, 1953

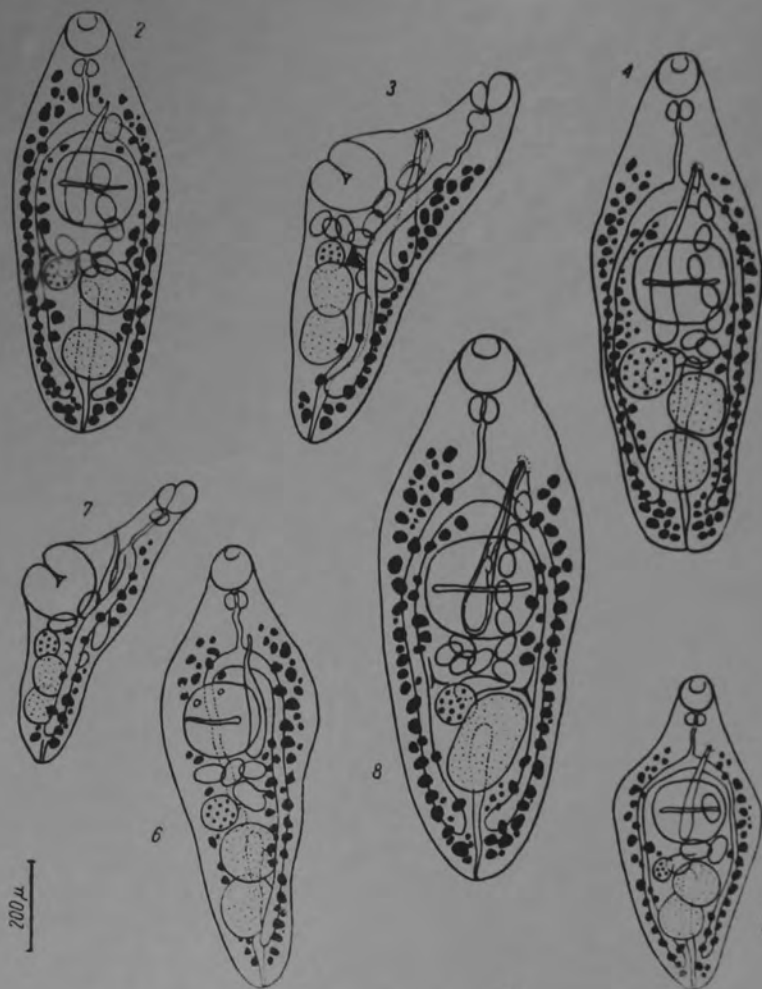


Plagioporus sp.
from *Coregonus albula*
from Slusarski, 1958



Rys. 1. *Plagioporus stefanski* sp. n. z *Salmo trutta* m. fario L. od strony brzusznej.
Plagioporus stefanski sp. n. from *Salmo trutta* m. fario L., ventral view.

Slusarski, 1958



5
 Słusarski, 1968

Rys. 2 — 8. *Plagioporus stefanski* sp. n. z *Salmo trutta m. fario* L., okazy o różnych stopniach zaawansowania dojrzałości płciowej: 2, 4, 5, 6, 8 — od strony brzusznej, 3, 7 — z boku, 8 — okaz z jednym jądrem.

Plagioporus stefanski sp. n. from *Salmo trutta m. fario* L., specimens in various stages of maturity: 2, 4, 5, 6, 8 — ventral view, 3, 7 — lateral view, 8 — a specimen with one testis.

110. *Plagioporus (Caudotestis) thalassomatis*
Yamaguti, 1942

(Fig. 74)

HABITAT: Intestine of *Thalassoma ballieui* (local name "hinalea luahine"); Hawaii.

DESCRIPTION (based on five whole mounts): Body fusiform, more attenuated posteriorly than anteriorly, 1.1-1.62 mm long, up to 0.44-0.6 mm wide at level of acetabulum. Cuticle with extremely fine transverse serrations on the surface. Oral sucker subterminal, 0.12-0.14 × 0.14-0.19 mm; prepharynx distinct; pharynx 70-100 × 70-140 μ; esophagus 80-150 μ long, bifurcating about midway between two suckers; ceca terminating blindly at level of ovary in front of left testis. Acetabulum 0.23-0.3 mm in diameter.

Testes obliquely tandem in posterior third of body, usually contiguous, subglobular, 0.1-0.22 × 0.1-0.2 mm. Cirrus pouch claviform, sigmoid anteriorly, 0.25-0.46 × 0.04-0.08 mm, reaching to, or to near, anterior end of acetabulum. Seminal vesicle N-shaped, up to 40 μ wide, occupying swollen posterior portion of cirrus pouch, with its attenuated tubular anterior portion straight or winding; pars prostatica rather poorly developed, though prostate cells are present. Ejaculatory duct may be everted as a smooth cirrus. Genital pore to left of esophagus at varying levels, may be near pharynx or intestinal bifurcation.

Ovary subglobular, 0.11-0.2 × 0.11-0.14 mm, dextral, at junction of middle with posterior third of body. Receptaculum seminis elongate or retort-shaped, about 35 μ wide, anterior or anteromedial to ovary. Laurer's canal arising from germiduct just at the point where the latter joins the seminal receptacle, opening dorsally to left of vitelline reservoir anterior to seminal receptacle. Uterus winding in postacetabular intercecal field, intruding into space between ovary and anterior testis, and may reach to posterior testis; metraterm running forward on left side of cirrus pouch. Mature eggs oval, 20-30 × 12-16 μ in life, with prominent knob at narrower end. Vitelline gland extending in lateral fields from level of pharynx or esophagus to cecal ends or a little more posteriorly, confluent in esophagobifurcal region; vitelline reservoir in front, or to left, of seminal receptacle. Excretory vesicle tubular, reaching to level of ovary; pore terminal.

DISCUSSION: Pritchard (1964) states, "The only difference between the two species (*P. neopercis* and *P. thalassomatis*) is that body and suckers measure somewhat larger in Yamaguti's specimens of *P. (C.) neopercis*, but the sucker ratios overlap and the difference is insufficient to separate the species. *Plagioporus (Caudotestis)*



testis) thalassomatis Yamaguti, 1942 is considered a synonym of *P. (C.) neopercis* Yamaguti, 1938." The present specimens agree completely with my original description of *P. (C.) thalassomatis* except for the posterior extent of the ceca, and it has been found that this species differs entirely from *P. (C.) neopercis* not only in body size but also in the ovarian complex, especially in the origin and course of the Laurer's canal.

Taking this opportunity, I would like to call our colleagues' attention to the fact that two closely related trematode species can be distinguished one from the other by careful comparison of the ovarian complex, just as in the present case. Cf. *Helicometra epinepheli* Yamaguti, 1934 vs. *H. hypodytis* Yamaguti, 1934.

108. *Plagioporus (Plagioporus) tobei* n. sp. Yam., 1970
(Fig. 72)

HABITAT: Intestine of *Conger* sp. (local name "tohei"); Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63692.

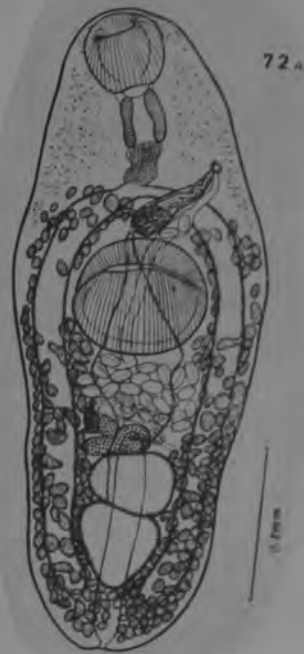
DESCRIPTION (based on 25 whole mounts): Body rather plump, with rounded extremities, 1.4-1.9 mm in length, with maximum width of 0.6-0.7 mm at level of acetabulum, 0.45-0.7 mm at level of ovary, whence the body tapers only a little posteriorly. Cuticle unspined; cervical gland cells well developed, their ducts filled with fine secretory granules. Oral sucker subterminal, 0.18-0.22 × 0.18-0.24 mm, followed by distinct prepharynx; pharynx barrel-shaped, 0.1-0.16 × 0.09-0.14 mm; esophagus muscular, 0.11-0.26 mm long, bifurcating at posterior part of anterior third of body; ceca wide throughout, terminating blindly at posterior extremity.

Acetabulum 0.31-0.37 mm in transverse diameter, largely pre-equatorial. Sucker ratio 1 : 1.4-2.4.

Testes slightly diagonal, contiguous, rounded triangular, 0.14-0.32 × 0.13-0.26 mm, confined to caudal third of body. Cirrus pouch claviform, slightly curved near its distal end, 0.2-0.45 × 0.06-0.1 mm; seminal vesicle fusiform to elliptical, or sigmoid, tapering anteriorly, up to 55-90 μ wide, occupying entire swollen part of cirrus pouch; pars prostatica tubular, indistinct, although prostatic cells are well developed; ejaculatory duct narrow, winding. Genital pore sublateral, to left of esophagus.

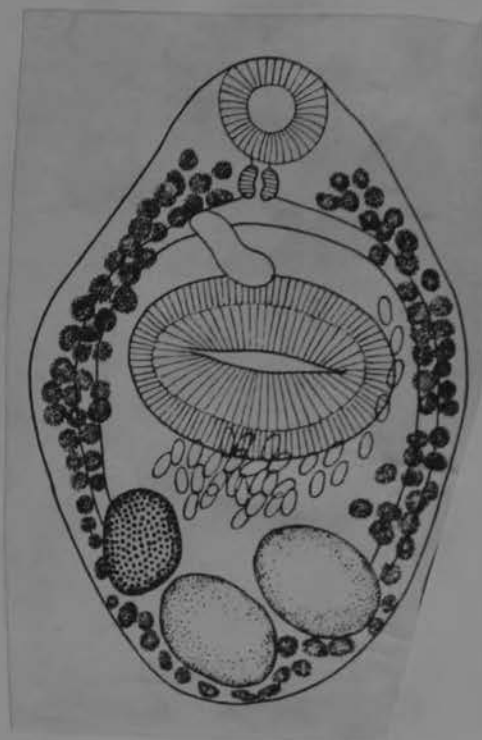
Ovary irregular in shape, may be three- or four-lobed, equatorial, immediately in front of anterior testis, more or less dextral to median line, 0.06-0.15 × 0.12-0.2 mm. Germiduct arising from anterior end of ovary, spirally twisted and joining seminal receptacle at its anterior end, where it turns to the left to join the common vitelline duct anterior to the ovary. Seminal receptacle rounded, about 42 μ in diameter in the type, situated anterodorsal or anterodextrodorsal to ovary, giving off Laurer's canal on its left margin. Laurer's canal wide proximally, running transversely and then backward, winding distally and opening outside dorsal to left anterior lobe of ovary or anterior end of anterior testis. Uterine coils confined to intercecal field between acetabulum and ovary; metraterm running obliquely on left side of cirrus pouch, and crossing distal end of cirrus pouch dorsally. Eggs oval, 46-63 × 35-42 μ in life. Vitellaria extending along ceca for their entire length, not exactly confluent behind posterior testis; vitelline reservoir indistinct, antero-sinistrodorsal to ovary. Excretory vesicle tubular, reaching to dorsal side of ovary, with dorsoterminal pore.

DISCUSSION: This species differs from the most closely related *Plagioporus congeri* n. sp. from the same host species in the anterior extent of the vitellaria and in the length and course of the Laurer's canal. It is also to be noted that the measurements of both species do not coincide. The specific name refers to the local name of the host.



Opecoelidae

Plagioporus (Plagioporus) trachuri Pogorelzeva, 1954



Vaz 1932

Trematichtys trematichtys, n. sp.

(figs. 3-4)

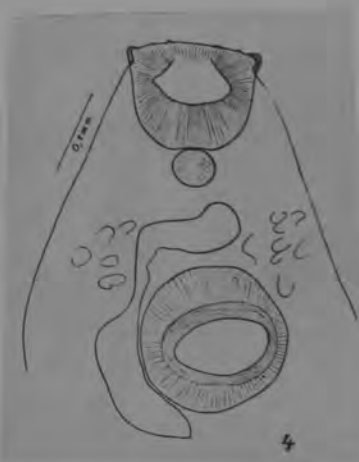
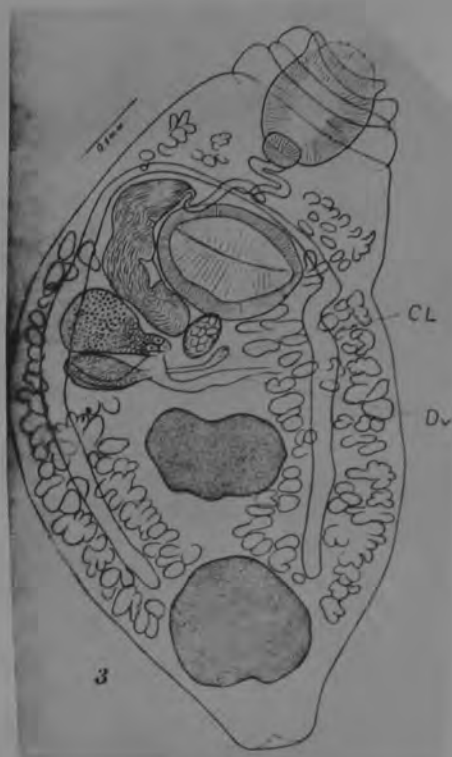
Habitat: Intestino delgado de *Glanidium neivai* Ihering (Bagrinho do guapé).

Distribuição geographica: Salto de Itú no Rio Tietê. Estado de S. Paulo. Brasil.

Typo e paratipos na coleção helminthologica do Instituto Biologico n.º 694.

Diagnose. Corpo achatado, largo nos $\frac{3}{4}$ posteriores, afinando-se na extremidade anterior. Esta, frequentes vezes apparece retrahida, cheia de dobras. Cuticula lisa. Comprimento variavel entre 0,84 e 1,1 mm. dependendo do grau de retração do corpo. Largura, medida ao nivel da zona equatorial, variavel entre 0,42 e 0,5 mms. A abertura da ventosa oral é provida de 2 pequenos apendices de cada lado. Ventosa oral arredondada, medindo 0,12 a 0,13 mms. de diametro. Logo abaixo della, na extremidade anterior do esophago existe um pequeno pharynge musculososo, medindo 0,040 a 0,049 mms. de diametro. Esophago relativamente curto; seu comprimento varia entre 0,14 e 0,16 mms. Cecos delgados, estendendo-se até 0,20 a 0,26 mms. da extremidade posterior. Acetabulo circular, situado pouco abaixo da bifurcação do esophago; seu diametro varia entre 0,17 e 0,18 mms. A distancia que separa o acetabulo da ventosa oral, varia com o grau de retração da extremidade anterior do corpo.

Apparelho genital feminino. Ovario piriforme, situado lateralmente, abaixo do acetabulo, com a superficie externa quasi em contacto com o ceco de seu lado. Suas dimensões variam entre 0,10 e 0,11 mms. de maior diametro. Do ovario sahe o oviducto que se dirige ao ootipo situado na linha mediana. Logo abaixo do ovario, mais proximo da linha mediana, apparece a espermatheca, tambem piriforme medindo em media 0,082 mms. e cujo canal vae tambem ao ootipo. Vitellinos ramificados, constituidos por grande numero de folliculos que se estendem desde a região esophagiana até quasi a extremidade posterior do corpo, acompanhando os cecos mas indo posteriormente além destes. Os vitellinos occupam as areas intra e extra-cecaes e recobrem os cecos. Só não invadem uma faixa estreita da zona mediana do corpo. Os vitelloductos correm na zona equatorial, encontrando-se na linha mediana para formar a vesicula vitellinica de forma triangular. Glandula da casca circumdando o ootipo. Utero curto, com poucos ovos, sahindo do ootipo dirige-se a principio para traz até o testiculo anterior; dahí torna a subir e, contornando o acetabulo, vae ao póro genital situado logo adiante desta ventosa. Ovos medindo 0,057 a 0,062 mms. de comprimento, por 0,033 a 0,037 mms. de maior largura.



Apparelho genital masculino. Testiculos grandes, arredondados, desiguales na forma e dimensões, situados um em frente ao outro. O testículo maior, que mede de 0,14 a 0,15 mms. de maior diâmetro, está situado junto da extremidade posterior do corpo. O menor, mais anterior, mede de 0,10 a 0,12 mms. de diâmetro. Delles sahem os canaes deferentes que se reúnem na entrada da bolsa do cirro. Esta inicia-se entre o ootipo e o acetabulo, faz um percurso sinuoso em torno desta ventosa e vae até o póro genital; seu comprimento varia entre 0,25 e 0,32 mms.

T. trematichtys, n. sp.

The body of our specimens is usually oval, the anterior end being thinned and generally retracted.
The length of this species varies between 0,84-1,1 mm.,
the breadth 0,42-0,5 mm.

Oral aperture with two appendages on each side and four small papillae.

The oral sucker reaches 0,12-0,13 mm., the ventral one 0,17-0,18 mm. in diameter; the length of the pharynx is 0,040-0,049 mm., of the oesophagus 0,14-0,16 mm.

The lateral pyriform ovary reaches 0,10-0,11 mm. in diameter and is situated near the acetabulum. A small seminal receptacle, 0,082 mm. in diameter, lies behind the ovary. The vitellaria consist of numerous follicles scattered in the inter and extra cecal area, extending from the oesophageal region to the posterior testes. The oötype is situated on the middle line. Uterus turns posteriorly and medial and below the anterior testis. From this region it passes forward to open in the genital aperture situated just in front of the acetabulum. Eggs not numerous; their size is 0,057-0,062 mm. by 0,033-0,037 mm.

The globular or slightly oval testes are unequal in size and shape; they lie one behind the other at the posterior extremity slightly separated one from the other.

The size of the posterior one is 0,14-0,15 mm., of the anterior one 0,1-0,12 mm.

The vasa efferentia pass into the cirrus pouch just behind the acetabulum. The long cirrus pouch surrounds the acetabulum and reaches to the genital pore and contains the seminal vesicle, prostata and cirrus, and varies from 0,25-0,32 mm. in length.

Habitat: small intestine of *Glanidium nelvai* Ihering.

Geographical distribution: River Tieté, S. Paulo, Brasil.

Type and paratypes in the helminthological collection of «Instituto Biologico de S. Paulo» n.º 694.

Opecoelidae

Plagioporus (Plagioporus) triangulogenitalis Belouss, 1958



Plagioporus truncatus (Linton, 1940)~~Yamaguti, 1955~~
Yamaguti, 1954LEBOURIA TRUNCATA, ~~Yamaguti, 1955~~ LINTON, 1940

PLATE 3, FIGURES 21, 22

0.67 to 1.57

Small distomes, smooth, generally broadest near posterior end, tapering to anterior end; often subtriangular in outline; ventral sucker larger than oral; pharynx about half diameter of oral sucker; esophagus short, but in flattened specimens as long as or longer than pharynx; intestines reach to posterior end; genital pore near posterior end of pharynx, on median line, or near it. Cirrus and cirrus pouch not seen; seminal vesicle dorsal to ventral sucker, seen at the anterior border of the ventral sucker in one, where it appeared to have been crowded forward by the mass of ova; in another it lay at the right posterior border of the ventral sucker, length, 0.09 mm., breadth, 0.045 mm., and extending for about half its length back of the ventral sucker. It would appear that the cirrus is represented only by an ejaculatory duct. Testes two, diagonal, contiguous. Ovary in front of right testis, on right side of median line, lobed. Uterus between testes and ventral sucker, many ova lying along the left side and in front of the ventral sucker, as far as the pharynx, and in one case to the left side of the oral sucker. While not certainly made out, the early folds of the uterus appeared to contain sperm. Shell gland on left of ovary; vitellaria diffuse, from posterior end along the margins to the level of the pharynx. Ova in balsam about 0.06 by 0.03 mm.

Type specimens.—U.S.N.M. No. 8216 (holotype and paratypes).

Hosts.—Common weakfish (*Cynoscion regalis*), kingfish (*Menticirrhus saxatilis*), white perch (*Morone americana*), lizardfish (*Synodus foetens*).



Is this *Monstremma*?
not *Lebouria* +
not *Plagioporus*
because of lack of
cirrus sac.

Plagioporus (Plagioporus) tumidulus (Rudolphi, 1819)

(Рис. 177) Price, 1934

Синонимы: *Distomum tumidulum* Rudolphi, 1819; *Allocreadium tumidulum* (Rudolphi, 1819) Odhner, 1901Хозяин: рыба — *Hippocampus signathus*.

Локализация: кишечник.

Место обваружения: (?)

Описание вида (по Однеру, 1901). Длина тела достигает 2,26 мм. Максимальная ширина от 0,35 до 0,5 мм на уровне брюшной присоски. От нее тело постепенно суживается и на обоих концах немного закруглено. Субтерминальная ротовая присоска имеет значительно меньшие размеры, чем брюшная, 0,18—0,26 мм. Длинный пищевод, 0,1 мм, разветвляется на две кишечных ветви, которые тянутся по бокам тела. Семенники представляют собой два округлых тела, которые лежат в задней части тела, медианно, один позади другого. У изучаемого экземпляра они достигали 1,5 мм длины и 0,12 мм ширины. Расстояние заднего семенника от заднего конца тела в 2—3 раза больше диаметра семенников. Яичник располагается вправо от переднего семенника. Желточники тянутся по бокам тела и простираются до пищевода. Немного изогнутая матка проходит между семенником и брюшной присоской и содержит яйца 0,056—0,065 мм длины и 0,034—0,043 мм ширины. Половая бурса не очень велика и доходит до переднего края брюшной присоски. Проксимальный конец ее содержит сильно извилистый семенной пузырек. Половое отверстие находится на правой стороне тела, на уровне заднего края фаринкса и приблизительно на половинном расстоянии между средней линией и краем тела.

Литература: Odhner, 1901.



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after Odhner, 1901

109. *Plagioporus (Plagioporus) ula-ula* n. sp. Yam., 1970
(Fig. 73)

HABITAT: Intestine of *Etelis marshi* (local name "ula'ula"); Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63693.

DESCRIPTION (based on 29 whole mounts): Body plump, smooth except for scattered cuticular papillae, 2.3-4.9 mm in length, with maximum width of 0.85-1.65 mm at acetabulo-uterine region. Oral sucker ventro-terminal, 0.13-0.3 × 0.2-0.36 mm, followed by distinct prepharynx up to 40-100 μ long; pharynx 60-130 × 100-190 μ ; esophagus 0.1-0.3 mm long; ceca terminating blindly at posterior extremity. Acetabulum large, 0.4-0.82 mm in diameter, situated at junction of anterior with middle third of body or a little more anteriorly or posteriorly; sucker ratio approximately 1 : 2.0-2.8.

Testes ovoid, 0.18-0.75 × 0.22-0.6 mm, obliquely tandem at about middle of hindbody. Cirrus pouch subcylindrical or claviform, 0.6-1.2 × 0.1-0.3 mm, provided with well-developed longitudinal muscles, usually extending to level of posterior end of acetabulum or beyond it, but may reach only to midlevel of this sucker when contracted, enclosing elongate seminal vesicle 70-200 μ wide, prostatic cells and ejaculatory duct which may be everted out of the genital pore as a smooth, stout cirrus. Pars prostatica not distinctly differentiated. Genital pore submedian, to left of posterior end of esophagus or a little farther behind.

Ovary four- or five-lobed, 0.15-0.42 × 0.12-0.55 mm, dextral, pretesticular, separated from testes by seminal receptacle 0.15-0.4 mm long by 0.07-0.24 mm wide. This receptacle may often lie transversely dorsal to the ovary. Laurer's canal arising from anterior end of seminal receptacle, running obliquely forward dorsal to uterus, opening dorsally at posterior end of acetabulum to left of median line. Uterine coils occupying whole intercecal field between acetabulum and anterior testis; metraterm running forward alongside cirrus pouch medial to left cecum, provided with a sphincter at distal end. Eggs 60-63 × 40-43 μ in life, 60-77 × 32-54 μ in mounted condition. Vitelline follicles circumcecal, extending from level of intestinal bifurcation to cecal ends. Excretory vesicle tubular, reaching to ovary, opening at median terminal notch by a narrow canal provided with sphincter-like structure.

DISCUSSION: This species differs from *Plagioporus apogonichthydis* Yamaguti, 1938, *P. sillagonis* Yamaguti, 1938, or any other *Plagioporus* species with a similar extent of the cirrus pouch in the ovary being four- or five-lobed. The specific name refers to the local name of the host. That the Laurer's canal opens dorsal to the posterior end of the acetabulum is worth noting.



Plagioporus

~~Lebouria~~ varia (Nicoll 1910) Price, 1934
Syn. ~~Lebouria~~ alacris (Looss) Nicoll 1909

Host: Callionymus lyra, "almost exclusively"
along whole British coast
Immature forms from Fleuronectes platessa.

Size 1.25- 1.75 mm, greatest breadth about 1/3 length.
Unarmed.

Oral sucker (in 1.5 mm. specimen) 0.18 mm

Ventral sucker 0.29 by 0.35 mm., 1/3 from anterior end.

Ratio of transverse diameters, 1:2.

Short pre-pharynx, large pharynx, short esophagus, ceca
large and end a little beyond testes.

Excretory vesicle a short simple sac not extending
beyond level of anterior testis.

Genital pore slightly to the left, slightly in front of
intestinal bifurcation.

Cirrus sac extends dorsal to ventral sucker but not
beyond center of ventral sucker.

Testes a little behind middle of body, contiguous,
oblique, anterior testis to the left. Oblique testes also
in L. alacris, L. obducta, and L. idonea. Posterior testis not
commonly heart-shaped with apex backward. The testes are
never transversely oval as in L. idonea.

Post-testicular space is nearly 1/5 body length.

Ovary mid-way between anterior testis and ventral sucker,
on the right, globular. Seminal receptacle pear-shaped at
level of anterior testis, large. Laurer's canal present.
Mullerian gland a little to left of ovary.

Yolk glands very voluminous, mainly lateral, extend
on inner side of ceca, overlap margins of gonads. Rarely
do they ever unite anterior to ventral sucker as in L. alacris.
Anterior limit a little behind posterior border of pharynx,
granules large.

Uterus short with not over 20 eggs. Eggs 85-92 by
51µ Average 88 by 45µ. Larger than in L. idonea.



Lebouria alacris



Lebouria varia

Plagioporus sp. From Al-Yamani and Nahhas, 1981

Host: *Nemipterus tolu* (Cuvier and Valenciennes), $\frac{1}{15}$
 Site: Intestine
 Locality: Al-Khiran
 Deposited specimen: U.O.P. Parasitol. Col.: K-7-29-2-78

Description based on two mature specimens, one incomplete, measurements on one. Body broadly elongate, 1.833 mm long, 0.500 mm wide at level of ventral sucker. Cuticle smooth; eyespot pigments absent. Oral sucker 0.140 mm in diameter; ventral sucker 0.257 mm long, 0.287 mm wide; sucker ratio 1:1.87. Prepharynx absent; pharynx 0.100 mm long, 0.095 mm wide; oesophagus half length of pharynx; caeca extending to near posterior extremity. Testes two, tandem, slightly irregular, in middle of hindbody; anterior testis 0.218 mm long by 0.307 mm wide; posterior testis 0.257 mm long by 0.267 mm wide; cirrus sac claviform, dextral to acetabulum, about 0.300 mm long, 0.077 mm wide at its base, containing coiled tubular seminal vesicle, and prostatic cells; cirrus 0.080 mm long. Ovary immediately anterior to anterior testis, smooth, 0.100 mm long by 0.210 mm wide; Mehlis' gland dorsal and seminal receptacle anterodorsal to ovary; uterus entirely preovarian. Vitellaria follicular, extending from level of caecal bifurcation laterally to posterior end of body and confluent posterior to posterior testis. Genital atrium small; genital pore submedian, dextral to base of pharynx. Eggs 55-60 by 30-40 μ m. Excretory vesicle tubular; its anterior extent not determined with certainty, but seems to reach at least posterior edge of posterior testis; excretory pore terminal.

Discussion

This species is not named because of limited material. At least 88 species have been described in the genus *Plagioporus*. Fifty-four of these are assigned to the subgenus *Plagioporus*, twenty-seven to the subgenus *Caudotestis*, one to *Paraplagioporus*, and the others not referred to any subgenus. *Paraplagioporus* is characterized by a long excretory vesicle which extends to anterior level of acetabulum or further forwards; in the other two subgenera, the excretory vesicle does not extend anterior to the ovariotesticular level. In *Caudotestis* the testes are closer to the posterior extremity than to the acetabulum, whereas in the subgenus *Plagioporus*, the testes are near the middle of the hindbody. On this basis, therefore, the present material belongs in the subgenus *Plagioporus*. It seems best not to name this species until additional material is available for examination.



0.5 mm

Stenakron sp. nov. BRAY, 1979
(Fig. 2)

OPECOELIDAE

HOST AND LOCALITY

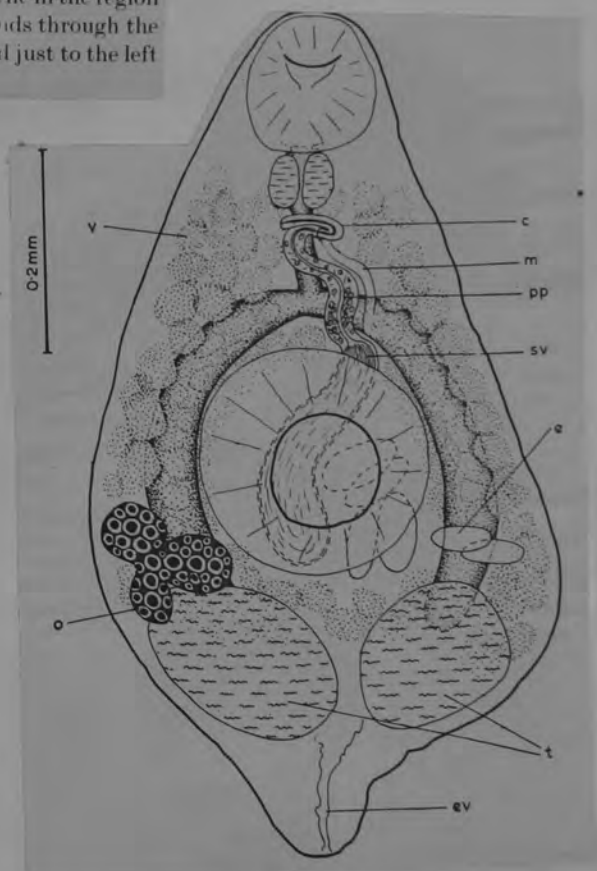
Triglops murrayi, intestine, (1/12),

Grand Bank (47°N., 48°W.; depth 172 m).

DESCRIPTION: A single worm was discovered, together with two specimens of *Caudotestis nicolli* (see below), with which it was at first confused. A close examination of the whole-mount preparation showed that it was not a damaged *C. nicolli*, but had characteristics suggesting that it was an anomalous specimen of *Stenakron*. The worm is 0.84 mm in length and 0.49 mm in maximum width which occurred just posteriorly to the ventral sucker. The worm is somewhat pyriform but with a fairly small posterior extension (fig. 2). The body-surface is unarmed. The subterminal oral sucker is more or less globular and 0.13 mm in diameter. A very short prepharynx leads to a globular pharynx (0.07 × 0.05 mm) which in turn leads into an oesophagus 0.08 mm long. The caecal bifurcation occurs close to the anterior margin of the ventral sucker, and the caeca reach around the ventral sucker. The left caecum just overlaps the left testis before terminating, but the full extent of the right caecum was not seen. It must terminate dorsally to the right testis. The circular ventral sucker lies more or less in the middle of the body and is 0.23 mm in diameter. The sucker ratio is 1 : 1.8.

Little of the excretory system has been made out. The pore is terminal and a narrow vesicle runs forward to just between the testes where it becomes wider. It could be traced no further.

The testes (0.16–0.18 × 0.12 mm) lie symmetrically just behind the ventral sucker. The elongate cirrus-sac (about 0.35 × 0.07 mm) reaches almost to the posterior margin of the ventral sucker and passes forward in a sinuous course. Dorsal to the ventral sucker the cirrus-sac contains the large, saccular seminal vesicle. The poorly developed pars prostatica and the fairly long ejaculatory duct lie in the region anterior to the ventral sucker. The cirrus is partly everted and extends through the genital pore which is close to the posterior margin of the pharynx and just to the left of the median line.



The trilobed ovary (0.13×0.093 mm) lies close to the right lateral margin of the body immediately anterior to the right testis. The details of the female proximal genitalia were not visible in this whole-mount. The uterus is to the left and anterior to the ovary and contains six eggs. Two are weakly tanned and not collapsed, measuring 88×44 and $78 \times 44 \mu\text{m}$; the remainder are more strongly tanned and collapsed, measuring about $80 \mu\text{m}$ in length. The numerous irregular vitelline follicles lie in the dorsal plane and laterally to the caeca. The central region of the worm is deficient in follicles, except in a narrow strip between the testes and the ventral sucker, and in the forebody the lateral fields come fairly close together. The vitelline field reaches from the pharynx to just overlap the testes.

DISCUSSION: This specimen may be a teratological specimen of *Stenakron vetustum* Stafford, 1904, or *S. skrjabini* (Issaitschikov, 1928). It is also somewhat similar to *Eurycreadium vitellosum* Manter, 1934, but differs in the posterior extent of the vitelline field, a feature that has been used (Yamaguti 1971, Prudhoe and Bray 1973) as a generic criterion. Manter (1934) had only two specimens of *E. vitellosum*, so there is very little information on the variation exhibited by this species.

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STENAKRON sp. indet.

Prudhoe and Bray, 1973

Hosts and localities: *Aconichthys harrissoni* — A.A.E., 65°6'S, 96°14'E; *Paraliparis wildi* — A.A.E., 65°6'S, 96°14'E.

These specimens have an overall morphology similar to that of *Stenakron kerguelense*. The two poorly-preserved specimens from *A. harrissoni* are 2.1 mm and 2.15 mm in length and 0.95 mm and 0.8 mm in width, respectively. They are fusiform, distinctly tapering towards both ends from the middle of the body. The oral sucker is subterminal and rounded, measuring about 0.2 mm in diameter, while the diameter of the ventral sucker is about 0.38 mm; the sucker ratio (oral:ventral) is about 1:1.9. Much of the reproductive system has not been made out, but the testes have been found to lie one directly behind the other in the posterior region of the body, while the vitellaria occupy the lateral fields, extending from the pharyngeal region to about the middle of the anterior testis. The vitelline follicles are confluent in the median line around the oesophagus and in front of the anterior testis. The eggs, which are collapsed, measure 100–115 μ m in length.

The single specimen from *P. wildi* is damaged posteriorly and is even less well preserved than the above specimens. It is 0.95 mm long and 0.52 mm wide. The oral sucker is subterminal and rounded, being 0.2 mm in diameter. The ventral sucker is also rounded and measures 0.25 mm in diameter. The vitelline follicles extend in the lateral fields of the body from the oral sucker to the anterior testis, and are confluent in the median line anteriorly and posteriorly. Collapsed and shrunken eggs measure about 110 μ m in length.

The condition of these three specimens is so very poor, as not to permit of a positive specific determination or even a comparison with other species of *Stenakron*.