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Binder 154, Opecoelidae Plagioporinae A-L [Trematoda Taxon Notebooks]

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Plagioporinae Manter, 1947

Subfamily diagnosis: Opaeoelidae: Body elongated, lanceolate, fusiform, elliptical, ovoid or plump, unispinulate. Acetabulum preequatorial sometimes equatorial. Prepharynx present or absent; oesophagus short or moderately long; caeca terminating blindly near or a little in front of posterior end. Testes tandem or oblique, rarely symmetrical, equatorial or postequatorial. Cirrus sac well developed, claviform, anterior to acetabulum, overlapping it or extending behind it. Vesicula seminalis externa absent. Genital pore median, usually to left, in level with oesophagus, intestinal bifurcation or pharynx. Ovary submedian, pretesticular or opposite anterior testis, rarely intertesticular. Receptaculum seminis present, rarely absent. Laurer's canal present. Uterus between ovary or anterior testis and acetabulum. Eggs with or without polar filament. Vitellaria lateral overlapping caeca for whole or part of their length from level of oesophagus, intestinal bifurcation or acetabulum to hinder end, confluent or not in posttesticular region. Excretory vesicle tubular, reaching ovary or testes. Parasitic in intestine of marine, brackish or fresh water fishes.

Type genus: *Plagioporus* Stafford, 1904 syn. *Lebouria* Nicoll, 1909

Other genera: *Hamacradium* Linton, 1910 syn. *Emmetrema* Caballero, 1946, *Helicandra* Odhner, 1902 syn. *Leborchia* Luhe, in Stossich, 1902, *Hystarogonia* Hanson, 1955, *Eurycradium* Manter, 1934 *Neopodocotyle* Dayal, 1950 *Pachycradium* Manter, 1954 *Podonolacotabulum* Yamaguti, 1934, *Choanostoma* Yamaguti, 1934 *Diplobulus* Yamaguti, 1934, *Plagiocirrus* Van Cleave and Mueller, 1932 *Podocotyle* (Duj., 1845) Odhner, 1905 syn. *Sinistroporus* Stafford, 1904, *Pycnadenoides* Yamaguti, 1938, *Spinoplagioporus* Skrjabin et Koval, 1958 *Stenopora* Manter, 1933 and *Staffordiella* n. g.

Key to genera of Plagioporinae

1. Receptaculum seminis absent.....2
 - Receptaculum seminis present.....4
2. Uterus extending to posterior end of body; vitellaria short, restricted to middle quarter of body just behind acetabulum
 -*Plagiocirrus* van Cleave and Mueller, 1932
 - Uterus pretesticular; Vitellaria long, extending from level of pharynx or oral sucker to behind testes near posterior end.....3
3. Body broadened towards middle; testes symmetrical or diagonal; cirrus sac club-shaped overlapping acetabulum.....
 -*Eurycradium* Manter, 1934.
 - Body long, cylindrical with broad anterior end; testes tandem; cirrus sac entirely preacetabular.....*Staffordiella* n. g.
4. Eggs filamented; receptaculum seminis anterior to ovary.....3
 - Eggs without filaments; receptaculum seminis not anterior to ovary.....6
5. Eggs with unipolar filament; cirrus sac slender, curved, very long, reaching far behind acetabulum*Stenopora* Manter, 1933,
 - Body lanceolate to foliate; pharynx small; oesophagus short; acetabulum not very large; cirrus sac club-shaped, entirely or mostly preacetabular; eggs filamented.....
 -*Helicandra* Odhner, 1902
 - syn. *Leborchia* Luhe in Stossich, 1902

6. Acetabulum small with long peduncle arising near oral sucker ; cirrus sac long, extending farther backward than base of acetabular peduncle..... *Poduncilacotabulum* Yamaguti, 1934.
 Acetabulum with short peduncle surmounted by puckerd margin of peduncle ; cirrus sac long slender or claviform extending or not extending backward beyond acetabulum ; excretory vesicle reaching to ovary.....
 *Podacotyle* (Duj. 1845) Odhner, 1905
 Syn. *Simistrophorus* Stafford, 1938
- Acetabulum with short peduncle as in *Podacotyle* ; Cirrus sac slender, extending a little farther backwards than the posterior limit of anterior third of body ; excretory vesicle very long, tubular, extending forward almost to acetabulum or beyond the anterior limit of vitellaria ; metraterm comma shaped and provided with manchette-like muscular ring with close transverse folds before opening into spacious atrium ; protruded cirrus presents characteristic petaloid appearance ; eggs with a knob-like protuberance at antiopercular pole .. *Podacotyloides* Yamaguti, 1934
 Acetabulum without peduncle.....7.
7. Oral sucker funnel-shaped ; cirrus sac long arcuate, extending behind acetabulum..... *Choanostoma* Yamaguti, 1934
 Oral sucker not funnel-shaped ; cirrus sac not arcuate.....8.
8. Oral sucker with bulbous swellings at its inner dorsal and ventral walls ; acetabulum thin walled sac with anterior and posterior walls thickened into transversely elliptical bulbs, the free border forming a transversely elongated aperture overlapping the muscle bulbs ; testes oblique tandem near posterior extremity ; uterus reaching behind testes near posterior end *Diplebulbus* Yamaguti, 1934.
 Suckers without bulbous swellings ; testes and uterus not as above9.
9. Pharynx large, longer than broad ; excretory vesicle long, terminating behind intestinal bifurcation.....
 *Hamacreadium* Linton, 1910. Syn. *Emmetrama* Caballero, 1946
 Pharynx not large, not longer than broad, excretory vesicle terminating behind acetabulum.....10.
10. Body pyriform ; acetabulum large nearer posterior extremity ; testes symmetrical at posterior end ; ovary intertesticular.....
 *Hysterozonia* Hanson, 1956.
 Body not pyriform ; acetabulum not nearer posterior extremity ; testes not symmetrical and not at posterior end of body ; ovary not intertesticular.....11
11. Acetabulum with circular fold.....12
 Acetabulum without circular fold.....13
12. Vitellaria from level of pharynx to posterior end of body, contiguous in post-testicular region..... *Pachycreadium* Manter, 1954.
 Vitellaria postacetabular confined to hindbody, confluent in posttesticular region..... *Pycnodanoides* Yamaguti, 1938.

FROM H. R. MEHRA (1966)

(CONTINUED NEXT PAGE)

CONTINUED FROM PRECEDING PAGE — PLAGIOPORINAE

13. Acetabulum non-pedunculate, almost equal to oral sucker; genital pore to left of pharynx; vitellaria postacetabular *Neopodocotyle* Dayal, 1950.
 Acetabulum non-pedunculate, larger than oral sucker; genital pore submedian, usually to left in level with oesophagus, intestinal bifurcation or occasionally pharynx; vitellaria from intestinal bifurcation or pharyngeal level to posterior extremity of body *Plagioporus* Stafford, 1904 syn. *Labouria* Nicoll, 1909
 syn. *Caudotestis* Yamaguti, 1934
 syn. *Paraplagioporus* Yamaguti, 1939.

Yamaguti (1958) places *Neopodocotyle*, Dayal, 1950 as a subgenus under *Podocotyle* (Duj., 1845), but we maintain it as a genus as it does not possess acetabulum with short peduncle. The genital pore lies to left of pharynx, whereas in *Podocotyle* it lies slightly to left side of intestinal bifurcation or at level of oesophagus.

We maintain the genus *Podocotylodes* Yamaguti, 1934 though Yamaguti (1958) has reduced it to the rank of a subgenus under *Podocotyle*. *Podocotylodes* has much longer excretory vesicle, which extends almost to acetabulum, beyond the anterior limit of vitellaria. Yamaguti (1934) himself mentioned "the peculiar characters of the terminal genital ducts prevent it from being assigned to *Podocotyle*". Its comma-shaped metraterm is provided with manchette—like muscular ring with transverse folds before opening into the spacious genital atrium. The slender cirrus sac of *Podocotylodes* extends a little farther than the posterior limit of the anterior third of body. The eggs of this genus bear a knob-like protuberance at the antioepicardial pole. Skrjabin, Petrow and Koval (1958) also recognise it as a genus.

The genera *Pachycreadium* Manter, 1954 and *Pycnadenoides* Yamaguti, 1933 are closely related. In both the acetabulum is large surrounded by a fold of body wall. The genital pore also lies to the left of pharynx. The testes are also similar in position. The cirrus sac is claviform, overlapping the acetabulum in both. But they differ in the extension of the vitellaria.

The receptaculum seminis is absent in only three genera of Plagioporinae, *Eurycreadium* Manter, 1934, *Plagiocirrus* Van Cleave and Mueller, 1932 and *Staffordiella* n. g. *Eurycreadium* possesses small pharynx, moderately long oesophagus, symmetrical or diagonal testes and cirrus sac club-shaped and overlapping the acetabulum, whereas *Staffordiella* n. g. has fairly large, rather prominent pharynx, short oesophagus, tandem testes and entirely preacetabular cirrus sac. *Eurycreadium* is parasitic in marine fishes, *Staffordiella* n. g. in brackish water fishes of Chilka lake (Orissa, India). *Plagiocirrus* is remarkable in having the uterus extending to posterior extremity of body and its vitellaria restricted to middle quarter of body just behind the acetabulum. This genus is parasitic in the digestive tract of fresh water fish, the golden shiner of Oneida lake, U. S. A. *Plagiocirrus* has genital pore sinistral at level of pharynx, testes slightly oblique near posterior extremity and cirrus sac overlapping the acetabulum and extending to its hinder border.

Cable (1956) thought that it is doubtful whether *Pachycreadium* is distinct from *Maculifer* Nicoll, 1915, pigmentation in the latter genus being the only morphological difference. He says "However, there is some evidence that pigment is stored in specialized cells rather than by parenchymatous cells in general, and it may be that such specialized cells are absent in the species assigned to *Pachycreadium*. Because of that possibility and differences in definitive hosts (porgies for *Pachycreadium* and puffers for *Maculifer*) the genus *Pachycreadium* is retained for the present, although further study may require that it be reduced to synonymy with *Maculifer*", which is included in the family Opistholebetidae.

I- Genus *Plagioporus* Stafford, 1904

Syn. *Lobowia* Nicoll, 1909.

Diagnosis : Plagioporinae : Body elliptical, fusiform or oval, unspinulate. Acetabulum preequatorial, sometimes equatorial. Caeca terminating near posterior extremity. Testes tandem or oblique, in midbody or near posterior extremity. Cirrus sac claviform, enclosing coiled seminal vesicle, prostatic complex and ductus ejaculatorius. Genital pore submedian, usually sinistral, in level with oesophagus or intestinal bifurcation. Ovary pretesticular, entire, submedian or median. Receptaculum seminis present. Vitellaria extending from a level of intestinal bifurcation or oesophagus reaching or not reaching posterior extremity. Uterus coiled, between ovary or anterior testis and acetabulum. Excretory vesicle tubular, reaching ovary, occasionally acetabulum. Parasitic in marine or fresh water fishes.

Genotype : *P. swotimus* Stafford, 1904

Gupta (1956) has recorded the genotype from the Gulf of Manaar in Indian Ocean.

From H.R. MEHRA (1966)

24. V. M. MEHRA

Allocreadiidae
Allocreadiinae

PLAGIOPORUS Stafford, 1904

Diagnosis as given by Sinitsin, 1931:

The fresh-water Allocreadiinae, in which the cirrus sac lies wholly in front of ventral sucker. The genital pore is situated on the level and to the left of the cecal bifurcation.

Price (1934) is convinced that the species included in the genus *Lebouria* are congeneric with *P. serotinus*, type of the genus *Plagioporus*. Stafford's description is meagre but the generic characters are clearly defined indicated. Therefore, Price makes the following combinations:

- m. 1. *P. aducta* (Nicoll) Price, 1934
- f. 2. *P. acerinae* (Pigulevsky) Price 1934
- m. 3. *P. alacris* (Looss) Price 1934
- f. 4. *P. cooperi* (Hunter & Bangham) Price 1934
- m. 5. *P. crassigula* (Linton) Price 1934
- f. 6. *P. elongata* (Goto & Ozaki) Price 1934
- m. 7. *P. idonea* (Nicoll) Price
- m. 8. *P. isaitschikowi* (Layman) Price
- m. 9. *P. nicolli* (Isaitschikov) Price
- m. 10. *P. obducta* (Nicoll) Price
- m. 11. *P. tumidulum* (Rudolphi) Price
- m. 12. *P. varia* (Nicoll) Price

Other species:

- m. 13. *P. fusiformis* Price, 1934
- f. 14. *P. serotinus* Stafford, 1904 - Type f. 22. *P. angusticollis* (Doy) Brindley, 1944
- f. 15. *P. silliculus* Sinitsin, 1931
- f. 16. *P. virens* Sinitsin, 1931
- m. 17. *P. calotomi* (Yamaguti) n. comb. 1934 Yamaguti, 1938
- m. 18. *P. choerodoni* (Yamaguti) n. comb. 1934 Yamaguti, 1938
- m. 19. *P. lobata* (Yamaguti) n. comb. Yam, 1938
- f. 20. *P. lepomis* Dobrovolny, 1939

Similar to *Podocotyle* but vitellaria anterior to acetabulum; ovary not trilobed; cirrus sac usually but not always entirely anterior to acetabulum.

m. *P. branchiostegae* Yamaguti, 1937

For life history see Dobrovolny, Chas. G. 1939
Trans. Amer. Micro. Soc., 58: 121-155.

f. 24. *P. angusticollis* (Hausman, 1896) Dobrovolny, 1939 (J.P.)

m. 25. *P. ira* Yamaguti, 1940

m. 26. *P. japonicus* Yamaguti, 1938

m. 27. *P. apogonichthydis* " "

m. 28. *P. pacificus* " "

f. 29. *P. sillagonis* " "

- 30. *P. ...* to *Pachycreadidum*
- 31. *P. sinitsini* Muller, 1939
- 32. *P. protei* Prudhoe, 1945
- 33. *P. serrata* Muller, 1940
- 34. *P. quathopogonis* (Yam.) Prudhoe

- m. 35. Plagioporus acanthogobii Yamaguti, 1951
 " 36. P. (Caudotestis) spari " "
 m. 37. P. (") azurionis " "
 m. 38. P. (") dorosomatic " "
 m. 39. P. (") synagris " 1952
 m. 40. P. (Plagioporus) macessarensis Yam., 1952
 m. 41. P. (") longivesicula Yam., 1952
 m. 42. P. pallensicus (Shipley & Hornell, 1905)
 m. 43. P. (Paraplagioporus) isagi Yam. 1939
 m. 44. P. (Caudotestis) pachysomus Mauter 1954
 m. 45. P. dactylopagi Mauter 1954
 m. 46. P. interruptus Mauter 1954
 m. 47. P. prepositus Mauter 1954
 f. 48. P. ^(Caudotestis) gacconis (Yam., 1934)
 f. 49. P. (caudotestis) orientalis (Yam. 1934)
 m. 50. P. (C.) neopescis (Yam. 1935)
 m. 51. P. (C.) thalassomater (Yam. 1942)
 m. 52. P. (C.) lethrini (Nagata, 1942)

Plagioporus

Lebouria Nicoll, 1909: 450

Small Allocreadiinae with broad, flat, oval body. Ventral sucker oval, larger than oral sucker, situated about in the middle of the body or a little in front of it. Esophagus short, intestinal bifurcation midway between the suckers. Excretory vesicle simple, short. Genital aperture median or slightly displaced, near the intestinal bifurcation. Testes of irregular shape, oblique or tandem, in the middle of the post-acetabular region. Cirrus pouch short, not reaching the middle of the ventral sucker, containing a convoluted vesicula seminalis and ductus ejaculatorius but lacking a well-developed pars prostatica although prostatic cells are present. Ovary rounded, on the right side, on a level with anterior testis or immediately in front of it. Receptaculum seminis and Laurer's canal present. Yolk glands extending in front of ventral sucker. Uterus short; ova few, thin-shelled, with small protuberance at the anopercular pole, measuring about 70 by 40 μ .

Type: Lebouria idonea Nicoll 1909

Also: L. obducta Nicoll named for Linton's species from Bairdiella chrysur 1904:389, figs.168-170

L. elongata Goto & Ozaki 1930

L. varia Nicoll

L. alacris (Loose)

~~Plagioporus~~ proteus Prudhoe, 1945

Stenakron Stafford, 1904syn. of Plagioporus Stafford, 1904*Stenakron vetustum*.Intes. *Hippoglossus hippoglossus* L. (Halibut).*Hemitripteris americanus* Gmel. (Sea Raven).

New genus, new species: $\sigma\tau\epsilon\nu\alpha\kappa\rho\nu\varsigma$, narrow; $\nu\epsilon\tau\alpha\sigma\tau\omicron\varsigma$, end *vetustus*,
old. Linton: Bull. U. S. Fish. Comm. 1899. (1901) p. 485.
Pl. XXXII, f. 359, Pl. XXXIII, f. 360-362.

FROM STAFFORD, 1904

Stenakron vetustum Stafford, 1904

(Fig. 10)

Host: *Hemitripteris americanus* (sea raven), from the intestine.

Stafford proposed the genus and species names *Stenakron vetustum* for a trematode from *Limanda ferruginea* which Linton (5) described but did not name. Stafford gives no description but refers to the description of Linton as follows:—

"Body smooth, fusiform, thickset about the middle tapering nearly equally to each end. Anterior sucker subterminal, circular, aperture somewhat triangular in preserved specimens, acetabulum, a little in front of the middle, larger than oral sucker, aperture nearly circular. Pharynx subglobular, close to oral sucker, oesophagus distinct. Intestinal rami simple, extending to ovary. Vitellaria distributed in the middle regions of the body from testes

MILLER: STUDY OF STAFFORD'S REPORT ON TREMATODES

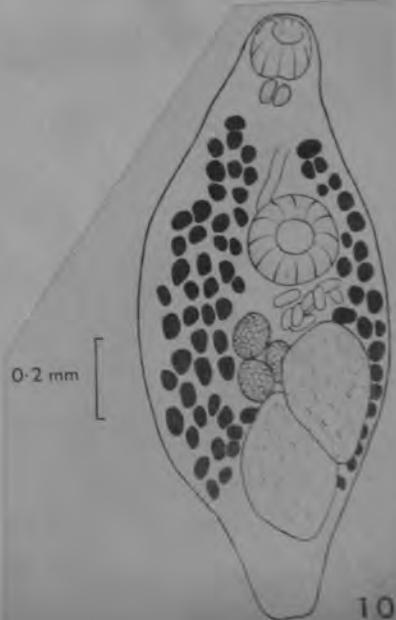
39

to pharynx. Testes two, rather large, placed a little diagonally on the median line near posterior end of body. Ovary smaller than testes, subglobular or slightly lobed, situated in front of the anterior testis and to the right. Ova, few, large, in front of ovary. Cirrus pouch to the right of acetabulum. Genital aperture about half-way between acetabulum and oral sucker, to right of median line, at about midway between pharynx and acetabulum. Dimensions of living specimen, in millimetres; length 2.57; diameter, anterior 0.25, middle 0.93; posterior 0.19; diameter of oral sucker 0.21, of acetabulum 0.36; anterior testis, length 0.43, breadth 0.36; posterior testis, length 0.43, breadth 0.37; ova, 0.065 and 0.041 in the two principle diameters."

The collection contains two specimens, one of which is badly contracted. Both specimens are overstained and the details of the alimentary tract and the cirrus pouch cannot be made out. The organs that can be seen agree quite well with Linton's description. The one important exception is in the character of the ovary. In the one specimen in which the ovary can be seen clearly it consists of three separate and distinct oval parts. Thus there are apparently three ovaries. Whether this holds true for all specimens of this species cannot of course be stated until further specimens are studied. However, Linton's diagrams of this species could be interpreted as having two ovaries. Stafford's specimens differ further from the Linton's description in the larger size of the eggs and the testes. They show the following measurements: body sizes 1.60 by 0.70 mm. and 1.50 by 0.72 mm. respectively, diameters of oral suckers 0.16 and 0.19 mm., diameters of acetabula 0.24 and 0.30 mm., pharynx 0.09 mm., anterior testis 0.39 by 0.24 mm., posterior testis 0.41 by 0.26 mm., eggs 0.077 by 0.036 mm.

Stenakron vetustum has not been assigned to any definite group of trematodes and Poche (17) lists it under "unclassified general". In its general morphology it agrees mostly nearly with members of the family Allocreadiidae where it probably belongs.

FROM MILLER, 1941

FIGS. 359-362
FROM LINTON,
1901

10

-OVER-

Stafford (1904) named *Stenakron vetustum* for a trematode listed as "*Distomum* sp." from *Limanda ferruginea* by Linton (1901) at Woods Hole, Massachusetts. Stafford reported it from two Canadian fishes but since he gave no description the genus and species must be based on the Woods Hole material. Miller (1941) describes Stafford's material from *Hemitripteris americanus*. Neither description is entirely complete and it is possible that Miller's specimens (with deeply lobed or even fragmented ovary) are not conspecific with the Woods Hole species. Linton's figure strongly suggests *Plagioporus* subgenus *Caudotestis*. It is to be hoped that more detailed knowledge of *Stenakron* will permit both genera as otherwise *Plagioporus* will become a synonym of *Stenakron* (page priority).

FROM MANTER, 1954

Stenakron vetustum Stafford, 1904

SYNONYMS: *Distoma* sp. of Linton (1901).

Rhodotrema problematicum Issaïtschikov, 1928.

Euryceradium problematicum (Issaïtschikov) Yamaguti, 1934.

Stenakron problematicum (Issaïtschikov) Mamaev, Parukhin and Baeva, 1963.

Rhodotrema quadrilobata Bazikalova, 1932.

Steringotrema (*Rhodotrema*) *quadrilobatum* (Bazikalova) Yamaguti, 1953.

Stenakron quadrilobatum (Bazikalova) Yamaguti, 1971.

HOSTS AND LOCALITIES

Careproctus reinhardti, intestine, (3/3).

Hamilton Inlet Bank (54°N., 54°W.; depth 188 m).

Grand Bank (47°N., 52°W.; depth 168 m).

(48°N., 50°W.; depth 215 m).

Hemitripteris americanus, intestine, (1/2).

Sable Island Bank (44°N., 61°W.; depth unknown).

Hippoglossoides platessoides, intestine, (1/13).

Sable Island Bank (44°N., 61°W.; depth unknown).

Hippoglossus hippoglossus, intestine, (1/5).

Hamilton Inlet Bank (54°N., 55°W.; depth 176 m).

Limanda ferruginea, intestine, (4/5).

Sable Island Bank (43°N., 61°W.; depth 92 m).

(44°N., 61°W.; depth unknown).

Grand Bank (46°N., 51°W., depth 80 m).

Lumpenus lamprætaeformis, intestine, (1/6).

Hamilton Inlet Bank (54°N., 54°W.; depth 188 m).

Lycodes vahli, intestine, (4/7).

Grand Bank (48°N., 50°W.; depth 168 and 215 m).

(47°N., 52°W.; depth 172 m).

Funk Island Bank (51°N., 52°W.; depth 228 m).

Reinhardtius hippoglossoides, intestine, (1/4).

Hamilton Inlet Bank (54°N., 54°W.; depth 192 m).

This species was originally described by Linton (1901) as *Distoma* sp. in *Limanda ferruginea* from Woods Hole, Massachusetts. Stafford (1904) gave it the name *Stenakron vetustum* and was the first to record it from eastern Canada, in *Hippoglossus hippoglossus* and *Hemitripteris americanus*. Further records from this region are from *L. ferruginea* (Ronald, 1960) and *Hippoglossoides platessoides* (Scott, 1975 a, b). Miller (1941) redescribed Stafford's material from *H. americanus* and further descriptions are given by Issaïtschikov (1928—under the name *Rhodotrema problematicum*), Bazikalova (1932—under the name *Rhodotrema quadrilobata*), Ronald (1960) and Mamaev *et al.* (1963). It is widely distributed in northern waters and is known to occur in the north Pacific Ocean, the Kara and Barents Seas and the north Atlantic Ocean. Its hosts are primarily pleuronectid flatfish and cottids.

FROM BRAY, 1979

Plagioporus Stafford, 1904

Syn. *Lebouria* Nicoll, 1909

Trematichthys Vaz, 1932

Generic diagnosis. — Allocreadiidae, Allocreadiinae: Body flattened elliptical, fusiform or oval. Oral sucker, pharynx and acetabulum well developed, latter pre-equatorial, sometimes equatorial. Ceca terminating at or near posterior extremity. Testes tandem or oblique, toward midbody in subgenus *Plagioporus*, or near posterior extremity in subgenus *Caudotestis*. Cirrus pouch more or less claviform, containing winding seminal vesicle, rather indistinct pars prostatica surrounded by prostate cells, and eversible ductus ejaculatorius. Genital pore submedian (usually on the left), level with esophagus or intestinal bifurcation, or occasionally with pharynx. Ovary pretesticular, submedian, sometimes median. Receptaculum seminis and Laurer's canal present. Vitellaria extending into forebody, not reaching to posterior extremity in subgenus *Caudotestis*. Uterus winding between ovary or anterior testis and acetabulum. Excretory vesicle tubular, reaching to ovary, occasionally to anterior end of acetabulum (*Paraplagioporus*). Flame cell formula: $2[(2+2)+(2+2)] = 16$ in *P. (Plagioporus) ira* and *P. (Paraplagioporus) isagi*. Parasites of marine and freshwater fishes. Divided into three subgenera, *Plagioporus*, *Caudotestis* and *Paraplagioporus* according to the difference in the position of the testes or in the anterior extent of the excretory vesicle.

Genotype: *P. serotinus* Stafford, 1904, in *Moxosoma macrolepidotum*; Canada. Also in *Archoplites interruptus*; California — Haderlie (1953). Haderlie's specific determination questioned by Manter (1954).

Other species¹⁾:

I. Subgenus *Plagioporus* Stafford, 1904 (Type: *P. serotinus*). For key to species see Manter (1954).

¹⁾ *Plagioporus shrjabini* Koval, 1952 (= *P. sp.* Koval, 1950) from *Neogobius kessleri* of lower Dnepr. is known to me only by name.

- P. acanthogobii* Yamaguti, 1951, in *Acanthogobius hasta*. Also encysted in gill chamber of *Ostracion tuberculatum*; Miya, Japan.
- P. acerinae* (Pigulewsky, 1931) in *Acerina cernua*; Dnjeprbassin.
- P. alacer* (Looss, 1901) in *Labrus maculatus*, *L. merula*, *Crenilabrus pavo*, *C. quinque maculatus* and *C. griseus*; Triest. Also in *Callionymus lyra*.
- P. angusticollis* (Hausmann, 1896) Dobrovolny, 1939, in *Cottus gobio*; Europe. Also in *Salmo gairdnerii*; California — Haderlie (1953). Life cycle (*Neritina fluviatilis* through *Asellus aquaticus*, *Gammarus pulex* to *Anguilla vulgaris*, *Cottus gobio*) — Mathias (1936, 37).
- P. apogonichthydis* Yamaguti, 1938 in *Apogonichthys carinatus*; Koti, Japan.
- P. branchiostegi* Yamaguti, 1937, in *Branchiostegus japonicus*; Obama, Sea of Japan.
- P. calotomi* (Yamaguti, 1934) in *Calotomus japonicus*; Inland Sea of Japan. Also in *Leptoscarus japonicus*; Hamazima, Japan.
- P. choerodontis* (Yamaguti, 1934) Yamaguti, 1938, in *Choerodon azurio*; Tarumi and Hamazima, Japan.
- P. cooperi* (Hunter et Bangham, 1932) in minnow; Lake Erie.
- P. crassigula* (Linton, 1910) in *Calamus calamus*; Florida. Also in *Calamus bayonado*, *Decodon puellaris* and *Diplodus holbrookii*; Florida.
- P. dactylopagri* Manter, 1945, in *Dactylopagrus macropterus*; New Zealand.
- P. idoneus* (Nicoll, 1909), syn. *Lebouria i. n.*, in *Anarhichas lupus*; North Sea.
- P. interruptus* Manter, 1954, in *Pseudolabrus coccineus*; New Zealand.
- P. ira* Yamaguti, 1940, (Pl. 15, Fig. 184) in *Choerodon azurio*; Hamazima, Japan.
- P. isaitschikowi* (Layman, 1930) in *Sebastes schlegelii*; Peter the Great Bay, Sea of Japan. Also in *Sebastes albofasciatus*; Suruga Bay, Japan.
- P. japonicus* Yamaguti, 1938 in *Neopercis sexfasciata*, *N. multifasciata*, *N. aurantiaca* and *N. muronis*, Sea of Japan; *Plotosus anguillaris*, Hamazima; *Lethrinus haematopterus*, Naha, Ryukyu Island.
- P. lobatus* (Yamaguti, 1934) in *Chelidonichthys kumu*, Toyama Bay, Japan.
- P. longivesicula* Yamaguti, 1952, in *Lethrinus sp.*; Macassar.

- P. macassarensis* Yamaguti, 1952, in *Lethrinus* sp.; Macassar.
P. macrouterinus Haderlie, 1953, in *Ptychocheilus grandis*; California.
P. obductus (Nicoll, 1909) in *Bairdiella chrysurus*; North Sea.
P. occidentalis Szidat, 1944, in *Gobio fluviatilis*; Germany.

P. pacificus Yamaguti, 1938, in *Neopercis multifasciata*, *N. aurantiaca* and *N. muronis*; Pacific.

P. preporatus Manter, 1954, in *Chelidonichthys kumu*; New Zealand.

P. serotinus Stafford, 1904 (vide supra).

P. siliculus Sinitzin, 1931, in *Salmo clarki*; Oregon. ⁶

Cotylocercous xiphidiocercaria with 6 pairs of penetration glands develops in liver of *Goniobasis plicifera silicula*, encysts in muscles of *Potamobius* sp. — Sinitzin (1931).

P. sillagonis Yamaguti, 1938, in *Sillago sihama*; Hamanako, Japan.

P. truncatus Linton, 1940, in *Cynoscion regalis*, *Menticirrhus saxatilis*, *Morone americana*, *Synodus foetens*; Woods Hole.

P. varius (Nicoll, 1910), syn. of *P. alacer* (Looss, 1901) — Manter, 1954, in *Callionymus lyra*; Firth of Clyde.

P. virens Sinitzin, 1931, in *Cottus* sp.; Oregon. Cercaria develops in *Flumincola virens* — Sinitzin (1931).

2. Subgenus *Caudotestis* Issaichikow, 1928 (Type: *P. nicolli*).

P. angulatus (Duj., 1845) Szidat, 1944, in *Anguilla*; Morbihan. ⁴

P. azurionis Yamaguti, 1951 in *Choerodon azurio*; Hamazima, Japan.

P. dorosomatis Yamaguti, 1951 (Pl. 9, Fig. 107) in *Dorosoma thrissa*; Miya, Japan.

P. elongatus (Goto et Ozaki, 1930) in *Sarcocheilichthys variegatus*; Lake Biwa, Japan. Placed in subg. *Plagioporus* — Manter (1954).

P. fusiformis Price, 1934, in *Xenomystax* sp.; Puerto Rico.

P. gnathopogonis (Yamaguti, 1934) in *Gnathopogon elongatus*; Lake Biwa, Japan.

P. lethrini Nagaty, 1942, in *Lethrinus nebulosus*; Red Sea.

P. neopercis Yamaguti, 1938, in *Neopercis aurantiaca*, *N. muronis* and *N. multifasciata*; Koti, Japan.

P. nicolli (Issaichikow, 1933) in *Icelus bicornis*; Russian Arctic.

P. orientalis (Yamaguti, 1934) in *Sarcocheilichthys variegatus* and *Pseudogobio esocinus*; River Yodo, Japan.

P. pachysomus Manter, 1954, in *Parapercis colias* and *Cyttus australis*; New Zealand.

P. protei Prudhoe, 1945, in *Proteus anguinus*; Slovenia, Herzegovina.

P. serratus Miller, 1940, in *Hyodon tergisus*; Quebec.

P. sinitsini Mueller, 1934, in *Catostomus commersonii*, *Notropis cornutus frontalis*; U.S.A.

Dobrovolny (1939) proposed a new subspecies *P. sinitsini huroni*, for *P. sinitsini* of Dobrovolny, 1939, from *Catostomus commersoni*, *Nocomis*, *Notropis*, *Lebistes*, *Campostoma*, *Hypentelium*, *Hyborrhynchus*; Michigan.

P. spari Yamaguti, 1951, in *Sparus longispinis*; Hamazima, Japan.

P. synagris Yamaguti, 1952, in *Synagris* sp.; Macassar.

P. thalassomatis Yamaguti, 1942, in *Thalassoma purpuraceum*; Naha, Ryukyu Island.

P. trematichthys (Vaz, 1932), syn. *Trematichthys t. V.*, in *Glanidium neivai*; Brazil.

P. zacconis (Yamaguti, 1934) in *Zacco temmincki* and *Oncorhynchus masou*; Japan.

3. Subgenus *Paraplagioporus* Yamaguti, 1939 (Type: *P. isagi*).

P. isagi Yamaguti, 1939 (Pl. 8, Fig. 100), in *Parapristipoma trilineatum*; Inland Sea of Japan. Placed in subg. *Plagioporus* — Manter (1954).

Issaichikow (1928) proposed a new subgenus, *Mediantestis*, for *P. tumidulum* (Rud., 1819) Price, 1934, from *Syngnathus hippocampus*; Vienna.

ALLOCREADIDAE Stossich, 1903.

VAZ, 1932

Trematichtys, n. g.

Diagnose. Ventosa oral sub-terminal. Pharynge presente. Esophago curto. Acetabulo pouco abaixo da bifurcação do esophago. Cecos terminando no $\frac{1}{4}$ posterior do corpo. Póro genital adiante do acetabulo. Não ha ventosa genital. Ovario piriforme, lateral, abaixo do acetabulo. Espermatheca piriforme, proxima da linha mediana, logo abaixo do ovario. Vitellinos constituídos de muitos folliculos que se estendem desde a bifurcação do esophago até o testiculo posterior, ocupando as areas cecal, intra e extra cecae; os vitelloguctos se dirigem para a linha mediana, convergindo para a vesicula vitellinica situada na linha mediana, na zona equatorial. Ootipo logo acima da vesicula vitellinica. Utero curto, com poucos ovos, dirige-se a principio para traz e depois para a frente até o póro genital. Testiculos arredondados situados um em frente ao outro, na linha mediana, ocupando o maior, a extremidade posterior do corpo. Canaes defferentes longos, penetrando na bolsa do cirro atraz do acetabulo. Bolsa do cirro bem individualisada, longa, sinuosa, contornando o acetabulo.

Habitat: Intestino delgado de peixes fluviaes.

Especie tipo: *T. trematichtys*, n. sp.

VAZ 1932

Trematichtys, n. g.

Diagnosis. *Allocreadidae* with oval body not covered with spines. Acetabulum behind the intestinal bifurcation. Genital pore without sucker, in front of the acetabulum. Pharynx present. The globular testes lie one behind the other at the posterior extremity of the body. Cirrus pouch present. Ovary pyriform, lateral, behind the acetabulum. Seminal receptacle just behind the ovary.

The vitellaria consist of numerous follicles extending from the oesophageal region to the posterior testis; they are inter and extra cecal. Uterus short. Eggs not numerous. Parasites of fresh water fishes.

Type species: *Trematichtys trematichtys* n. sp.

Key to species of *Plagioporus* (*Plagioporus*) from Hawaiian fishes

1. Cirrus pouch very long, extending well back of acetabulum *P. longisacculus*
 Cirrus pouch reaching to level of posterior end of acetabulum;
 metraterm with sphincter at distal end.
 Laurer's canal opening dorsal to posterior end of acetabulum;
 vitellaria commencing at bifurcal level *P. ula-ula*
 Laurer's canal opening some distance behind acetabulum;
 vitellaria commencing at anterior end of acetabulum *P. rooseveltae*
 Cirrus pouch largely pre-acetabular 2
2. Testes and ovary multilobate; Laurer's canal directed forward,
 opening just medial to left cecum *P. polymixiae*
 Testes unlobed, ovary lobed or not 3
3. Ovary distinctly lobed; Laurer's canal long, directed
 transversely and then backward windingly, opening
 dorsal to left end of ovary *P. tohei*
 Ovary heart-shaped; Laurer's canal short, directed backward,
 opening dorsal or sinistral to ovary *P. congeri*

The Genus *Plagioporus* Stafford, 1904

The genus *Plagioporus* Stafford, 1904 (= *Lebouria* Nicoll, 1909) is a large one; at least 43 species have been named in it. It is one of the few genera of trematodes in both marine and freshwater fishes. The similarity of the genera *Plagioporus*, *Podocotyle*, and *Hamacreadium* has been discussed by Manter (1947). In practically all species of *Plagioporus* the vitellaria extend anterior to the acetabulum although not much so in *P. cooperi* (Hunter and Bangham, 1932). The genital pore is sinistral. The ovary is lobed in only a few species; the testes, usually tandem, can be diagonal.

The following changes are proposed with the intent of clarifying the genus.

It is recommended that *P. crassigulus* (Linton, 1910) Price, 1934 and *P. gastrocotylus* Manter, 1940 be removed to a new genus, *Pachycreadium*, with the following characters:

Pachycreadium n.gen. Body thick and stout with strong suckers and large pharynx. Body musculature around acetabulum strongly developed and may form a fold of skin. Oesophagus short; caeca wide. Genital pore median or submedian, not far from intestinal bifurcation. Testes postovarian, unlobed, tandem or diagonal, close together. Cirrus sac with sinuous seminal vesicle, overlapping anterior half of acetabulum. Ovary unlobed, slightly dextral. Vitellaria profuse, from region of pharynx to posterior end of body, contiguous posterior to testes. Uterus partly to left of ovary and extending backward to posterior edge of anterior testis. Type species: *P. gastrocotylum* (Manter, 1940) n.comb. Other species *P. crassigulum* (Linton, 1910) n.comb.

Pachycreadium differs from *Plagioporus* in more median genital pore, thick body, large pharynx, and in the muscular development of the body wall near the acetabulum. Also, the uterus extends more posteriorly. Both of the species are from marine fishes of the genus *Calamus*; one is at Tortugas, Florida; the other at the Galapagos Islands. Although as noted (Manter, 1940) these trematodes show similarity to the Fellodistomatidae they are retained for the present in the Opecoelidae.

Seventeen species of *Plagioporus* in the subgenus *Caudotestis* have been discussed above (p. 512). Of the remaining species named in *Plagioporus* several probably do not belong in the genus. *P. serratus* Miller, 1940 has a spined cuticula and probably belongs in the family Lepocreadiidae. I agree with Miller (1940)

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that *P. obducta* (Nicoll, 1909) Price, 1934 does not belong in the genus. Not only is the genital pore median but there is doubt if a cirrus sac is present. *Lebouria truncata* Linton, 1940 is also a doubtful *Plagioporus* species as its cirrus sac was not observed. I consider *P. varius* (Nicoll, 1910) Price, 1934 a synonym of *P. alacer* (Looss, 1901) Price, 1934. *P. pallensicus* (Shiple and Hornell, 1905) Yamaguti, 1952 (?) is incompletely described.

"*Plagioporus angusticolle* (Hausmann, 1896) Dobrovolny, 1939" was reported from *Salmo gairdnerii*, the rainbow trout, in California by Haderlie (1953). However, Hausmann's 1897 description and figure (Rev. Suisse. Zool., vol. 5, pp. 1-42, pl. I, fig. 1) shows that the California species is different in several respects, notably in the anterior extent of the vitellaria which reach the oral sucker in *P. angusticolle*, and in the shape and extent of the cirrus sac which is elongate and reaches even past the acetabulum in *P. angusticolle*.

Haderlie also reports one specimen of "*Plagioporus serotinus* Stafford, 1904" from *Archoplites interruptus* in California. However, the shape of the cirrus sac differs from the Canadian species (Miller, 1940, p. 424) and judging from Haderlie's figure the egg size is considerably smaller than the 70 to 90 μ of *P. serotinus*.

Plagioporus macrouterinus Haderlie, 1953 is unusual in that the uterus extends backward to overlap the posterior testis. Haderlie decided his species was "not close to . . . the genus *Allocreadium*" but did not say why, presumably because the genital pore is not median.

Stafford (1904) named *Stenakron vetustum* for a trematode listed as "*Distomum* sp." from *Limanda ferruginea* by Linton (1901) at Woods Hole, Massachusetts. Stafford reported it from two Canadian fishes but since he gave no description the genus and species must be based on the Woods Hole material. Miller (1941) describes Stafford's material from *Hemitripterus americanus*. Neither description is entirely complete and it is possible that Miller's specimens (with deeply lobed or even fragmented ovary) are not conspecific with the Woods Hole species. Linton's figure strongly suggests *Plagioporus* subgenus *Caudotestis*. It is to be hoped that more detailed knowledge of *Stenakron* will permit both genera as otherwise *Plagioporus* will become a synonym of *Stenakron* (page priority).

Another genus related to *Plagioporus* is *Eurycreadium* Manter, 1934 which differs only in that both testes are posterior to the caeca and the genital pore is more median.

Because of the wide distribution and common occurrence of the genus *Plagioporus*, a key to species of the subgenus *Plagioporus* is given here.

KEY TO SPECIES OF THE GENUS *PLAGIOPORUS*, SUBGENUS *PLAGIOPORUS*

- 1 (4) Genital pore opposite oral sucker 2
 2 (3) Testes lobed *P. preporatus* (this paper)
 3 (2) Testes unlobed *P. dactylopagri* (this paper)
 4 (1) Genital pore posterior to oral sucker 5
 5 (6) Ovary lobed 7
 6 (5) Ovary unlobed 17
 7 (10) Testes lobed 8
 8 (9) Sucker ratio 1 : 1.8 to 2.36 *P. lobatus* (Yamaguti, 1934) Yamaguti, 1938
- 9 (8) Sucker ratio 1 : 1.4 to 1.6 *P. acanthogobii* Yamaguti, 1952
 10 (7) Testes unlobed 11
 11 (12) Eggs only about 22 μ long *P. choerodonis* (Yamaguti, 1934) Yamaguti, 1938
 12 (11) Eggs at least 54 μ long, usually more than 70 μ 13
 13 (14) Excretory vesicle long extending anterior to acetabulum *P. longivesicula* Yamaguti, 1952
 14 (13) Excretory vesicle short, not reaching acetabulum 15
 15 (16) Genital pore posterior to pharynx; eggs 90-98 μ *P. elongata* (Goto and Ozaki, 1930) Price 1934
 16 (15) Genital pore opposite pharynx; eggs 75-82 μ *P. ira* Yamaguti, 1940
 17 (22) Vitellaria interrupted opposite acetabulum 18
 18 (21) Testes tandem; vitellaria reaching to pharynx 19
 19 (20) Vitellaria interrupted opposite testes *P. interruptus* (this paper)
 20 (21) Vitellaria not interrupted opposite testes *P. isaitschikovi* (Layman, 1930) Price, 1934
 21 (18) Testes oblique; vitellaria not reaching pharynx *P. macassarensis* Yamaguti, 1952
 22 (17) Vitellaria not interrupted opposite acetabulum 23
 23 (24) Genital pore opposite pharynx 25
 24 (23) Genital pore posterior to pharynx 29
 25 (26) Acetabulum less than 2 \times oral sucker *P. calotomi* (Yamaguti, 1934) Yamaguti, 1938
 26 (25) Acetabulum at least 2 \times oral sucker 27
 27 (28) Acetabulum at midbody; uterus extending to posterior testis *P. branchiostegi* Yamaguti, 1937
 28 (27) Acetabulum anterior to midbody; uterus not extending to posterior testis *P. japonicus* Yamaguti, 1938
 29 (32) Vitellaria extending to base of oral sucker 30
 30 (31) Cirrus sac extending to posterior edge of acetabulum or beyond *P. angusticolle* (Hausmann, 1896) Dobrovolny, 1939
 31 (32) Cirrus sac not extending to posterior edge of acetabulum *P. apogonichthydis* Yamaguti, 1938
 32 (29) Vitellaria not extending to base of oral sucker 33
 33 (34) Uterus extending to posterior testis *P. macrouterinus* Haderlie, 1953
 34 (33) Uterus not extending to posterior testis 35
 35 (36) Excretory vesicle long, reaching to anterior end of acetabulum *P. isagi* Yamaguti, 1939
 36 (35) Excretory vesicle not reaching to anterior end of acetabulum 37
 37 (40) Vitellaria not extending anterior to acetabulum 38
 38 (39) Excretory vesicle reaching to ovary *P. virens* Sinitsin, 1931
 39 (38) Excretory vesicle short, reaching only to posterior testis *P. lepomis* Dobrovolny, 1939
 40 (37) Vitellaria extending anterior to acetabulum 41

- 41 (42) Ovary in midline, directly anterior to testes 43
- 42 (41) Ovary slightly to right of midline 47
- 43 (44) Vitellaria not reaching anterior to intestinal bifurcation *P. siliculus* (Nicoll, 1909) Price, 1934
- 44 (43) Vitellaria extending anterior to intestinal bifurcation 45
- 45 (46) Acetabulum much larger than oral sucker; uterus extending to anterior testis *P. pacificus* Yamaguti, 1952
- 46 (45) Acetabulum only slightly larger than oral sucker; uterus entirely proovarian *P. occidentalis* Szidat, 1944
- 47 (50) Testes tandem 48
- 48 (49) Excretory vesicle extends only to posterior testis *P. serotinus* Stafford, 1904
- 49 (48) Excretory vesicle extends to ovary *P. sillagonis* Yamaguti, 1938
- 50 (47) Testes oblique 51
- 51 (52) Seminal receptacle posterior to ovary; eggs 85-92 μ *P. alacer* (Looss, 1901) Price, 1934
- 52 (51) Seminal receptacle anterior to ovary; eggs 71-74 μ *P. idoneus* (Nicoll, 1907) Price, 1934

Koval, V. P.

1959

Critical review of the specific composition of the genus *Plagioporus* Stafford, 1904 (Trematoda: Digenea).

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1959 г.

ТРУДЫ ГЕЛЬМИНТОЛОГИЧЕСКОЙ ЛАБОРАТОРИИ

ТОМ IX

В. П. КОВАЛЬ

КРИТИЧЕСКИЙ ОБЗОР ВИДОВОГО СОСТАВА РОДА
PLAGIOPORUS STAFFORD, 1904
(TREMATODA: DIGENEA)

В настоящее время описано более 40 видов рода *Plagioporus* от рыб Тихого океана, Атлантики и связанных с ними морей.

Изучение мировой литературы по упомянутому роду, а также собственных материалов по виду *Plagioporus skrjabini* Kowal, 1951, показало, что для этого рода характерна большая изменчивость морфологических признаков.

Взаиморасположение половых желез в этом роде считается одним из наиболее важных диагностических признаков. Однако при установлении новых видов на одиночных экземплярах этот признак не может служить надежным, так как у одного и того же вида, в чем можно убедиться на примере *Plagioporus skrjabini*, яичник может располагаться как рядом с передним семенником, так и впереди него. То же самое можно сказать и о расположении половой бursy, заднюю границу которой нельзя строго фиксировать.

Вместе с тем при описании видов *Plagioporus* часто совершенно игнорируется как изменчивость организма, так и влияние сокращений тела на расположение органов. В большинстве случаев это объясняется тем, что при установлении диагноза авторы основывались на слишком малом числе особей, не позволяющих установить вариаций, часто весьма значительных.

Анализ изменчивости отдельных морфологических признаков в пределах вида *Plagioporus skrjabini* привел к необходимости произвести ревизию рода *Plagioporus*. При этом сведены в синонимы следующие «виды»: *P. varius* (Nicolli, 1909) = *P. alacris* (Looss, 1901); *P. idoneus* (Nicolli, 1909) = *P. alacris* (Looss, 1901). Между указанными видами нет возможности провести границу. Так, *P. varius* отличается от *P. alacris* более мелкими размерами семенников и наиболее развитыми впереди и сзади желточниками. Такими же незначительными признаками отличается от *P. alacris* другой вид — *P. idoneus*.

Не вызывает сомнений также идентичность двух видов, описанных Ямагути в 1934 г. — *P. orientalis* и *P. gnathopogonis*, которые очень напоминают друг друга, за исключением того, что у второго вида семенники более сближены, чем у первого. Кроме того, Ямагути в дифференциальном диагнозе *P. gnathopogonis* указывает на незначительные отклонения в размерах яиц (у *P. gnathopogonis* размеры яиц $0,081 \times 0,05$ мм, у *P. orientalis* — $0,09 \times 0,053$ мм).

Нами исключен из списка видов *Plagioporus* *P. acerinae*, описанный Пигулевским в 1931 г. и отнесенный им к роду *Lebouria*. Этот вид сведен нами в синоним *Coitococum skrjabini* Iwanitzkiy, 1928.

Layman's (p.31) key to his subgenera of *Lebouria*

- A. Testes arranged diagonally
1. Ovary rounded. Vitellaria contiguous in posterior part of body and extend posteriorly to very tip. Uterus between anterior testis and ventral sucker.....L.*Lebouria* n. subgenus
 2. Ovary oval or egg shaped. Vitellaria not contiguous posteriorly and do not reach extreme tip of body. Uterus between posterior testis and ventral sucker..... L.*Caudotestis*
- B. Testes arranged tandem (medianly). Ovary rounded (?) Vitellaria contiguous posteriorly and reach to extreme posterior tip. Uterus between anterior testis and ventral sucker.....L. *Mediantestis*

Layman's (p.33) key to species of *Lebouria*

- A. Testes arranged diagonally
- I. Vitellaria on both sides contiguous posteriorly
 - a. Vitellaria extend anteriorly beyond the intestinal bifurcation.
 1. Testes closer to ventral sucker than lower part of body.
 - (a) Sex pore almost at level of the anterior part of the left intestinal cecum
Lebouria Lebouria alacris
 - (b) Sex pore just anterior to branching of ceca....*L. (Lebouria) varia*.
 2. Testes half way between ventral sucker and posterior end of body. Sex pore anterior to intestinal bifurcation...*L. (Lebouria) idonea*
 - b. Vitellaria do not extend anteriorly beyond intestinal bifurcation. Testes half way between ventral sucker and posterior end. Sex pore slightly behind the branching of the ceca.....*L. (Lebouria) obducta*
 - II. Vitellaria on both sides do not unite medianly. Vitellaria extend anteriorly beyond branching of ceca. Testes nearer posterior end than to the ventral sucker. Sex pore almost at the anterior edge of ventral sucker.....*L. (Caudotestis) nicolli*
- B. Testes are directly behind each other, median. Vitellaria contiguous medianly posteriorly. Vitellaria extend anterior to forking of ceca. Testes nearer ventral sucker than posterior end. Sex pore anterior to forking of the ceca (at level of posterior end of pharynx).....
..... *L. (Mediantestis) tumidulum* (Rud.)

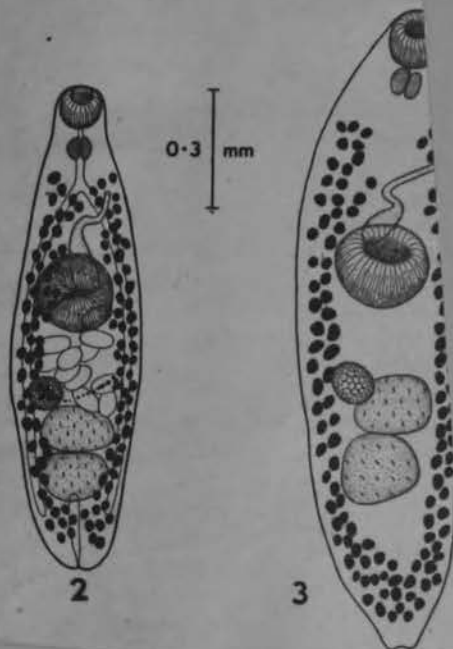
Plagioporus serotinus Stafford, 1904

(Figs. 2 and 3)

Hosts: *Moxostoma aureolum* (red horse sucker)
Catostomus commersonii (common sucker)

fresh water

The worms of this species are small, narrow forms, broadest in the middle and tapering gradually to both extremities. The cuticula is smooth. They measure from 1.0 to 1.4 mm. in length in the common sucker, whereas specimens from the red horse sucker measure up to 2.2 mm. in length. They are approximately one-fourth as broad as long. The oral sucker is terminal.

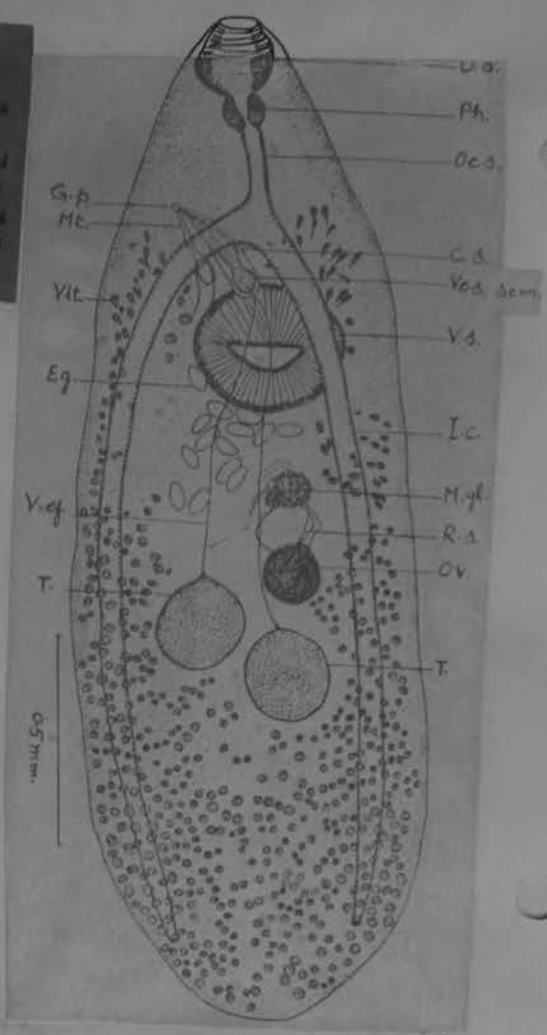


Miller 1940
from ~~Haderlich~~, 1952

Genus: *Plagioporus* Stafford, 1904
Plagioporus serotinus Stafford, 1904 (Fig. 2)

Only one specimen of *Plagioporus serotinus* Stafford, 1904, was found in the intestine of a marine cat-fish caught from the Gulf of Mexico. In this specimen the author finds that the testes are diagonally placed. Instead of tandem, the ovary is smaller than the testes and lies in front of the anterior testis; the vitellaria are confluent in the post-testicular region and form a mass of 10-15 cells, each with 5-6 eggs. There were fifteen eggs in the uterus.

N.K. GUPTA, 19



probably not *l. serotinus*
 l. not *l. serotinus*
 eggs and rest
 date of

(P.)

Plagioporus serotinus Stafford, 1904

1.62 by 0.43. Fusiform, broadest at ventral sucker, ends narrowed, ventral sucker 1.5 times breadth of oral, in front of middle of body. Oral 0.138, ventral 0.231, distance from anterior end 0.646. Skin smooth. Esophagus twice length of pharynx. Ceca to posterior end. Testes, one close behind the other in the center of the post-acetabular body. Ovary small, close in front and to one side of first testis. Uterus between testes and sucker but my specimens contain no eggs. Penis-sack extends from ventral sucker across the right cecum and opens ventrally near the side of the body on a level with the posterior end of the esophagus. Vitellaria lateral, from the esophagus to the posterior end.

Host: Moxostoma macrolepidotum, large scaled sucker

Catostomus commersoni common sucker
Canada.

No figure given. See Miller, 1940

ceca extend past testes

Eggs 70-90 by 50-60.

Plagioporus serotinus Stafford, 1904

(Pl. 33, a)

Host.—*Archoplites interruptus*, in intestine.

The Sacramento perch (*Archoplites interruptus*) is the only member of the sunfish family native to California. It was formerly quite common in the state, but is now rarely found except in Clear Lake. Only 14 of these fish were collected. In the intestine of one was a solitary large trematode. In life the worm was able to stretch to 4 mm. in length. The anterior end was very active and could stretch to become as long as the rest of the body. In life the ventral and oral suckers

from ~~Miller~~ Haderlie, 1953

2. *Plagioporus acanthogobii* n. sp.

Pl. I, Fig. 2.

Habitat. Small intestine of *Acanthogobius hasta* (Temm. et Schleg.) (type host), also encysted in gill chamber of *Ostracion tuberculatum* Linné.

Locality and date. Miya, Mikawa Province; April 20, 1941.

Material. Numerous gravid specimens fixed in acetic sublimate under slight cover glass pressure, stained and mounted as usual.

Body shaped like a dorsoventrally flattened elongate pear, 1.5-3.4 mm long, 0.65-1.0 mm broad in middle region, whence it tapers markedly toward blunt-pointed anterior extremity. Cuticle thick (up to 5 μ) and smooth. Oral sucker subterminal, 0.16-0.225 \times 0.17-0.25 mm. Prepharynx distinct. Pharynx usually barrel-shaped, 84-110 \times 75-120 μ . Esophagus 50-80 μ long, bifurcating at about middle of anterior third of body. Ceca narrow, terminating convergently near posterior extremity. Acetabulum 0.25-0.33 \times 0.27-0.38 mm, at anterior end of middle third of body, sucker ratio 1:1.4-1.6.

Testes very large, irregularly lobed¹⁾, usually exactly tandem, 0.15-0.31 \times 0.37-0.58 mm; the anterior situated in median field, sometimes a little to the left, at junction of middle with posterior third of body; the posterior always median, intruding into caudal third of body, with its posterior end 0.06-0.4 mm from posterior extremity. Cirrus pouch claviform, more or less curved, 0.33-0.6 \times 0.07-0.095 mm, provided with well developed longitudinal muscle, reaching to anterior border of acetabulum. Vesicula seminalis tubular, 50-80 μ wide, looped as in *Plagioporus lobatus* (Yamaguti). There is no distinct pars prostatica, though the prostate cells are well developed. Genital pore in left submedian line at level of esophagus.

Ovary lobed irregularly but less conspicuously than testes, sometimes with entire margin 0.21-0.35 \times 0.1-0.24 mm, pos.

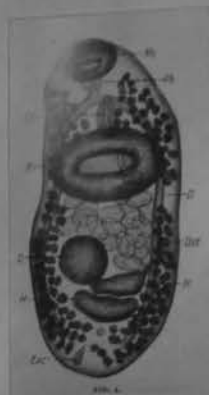
equatorial, usually in front of right portion of anterior testis, occasionally opposite it when the latter lies out of the median line; it may or may not overreach the right cecum on its ventral side. In the type the germiduct, arising from the dorsal side of the ovary near its anteromedial corner, forms a cylindrical dilatation about 20 μ in diameter as it crosses ventrally the right transverse vitelline duct, on the dorsal side of which it joins the receptaculum seminis and the Laurer's canal. At this point it turns abruptly forward and then joins the vitelline reservoir in the median line 0.24 mm behind the acetabulum. Shell gland dorsomedian, just postequatorial. Receptaculum seminis club-shaped, dorsal to ovary, 84 μ broad at base in the type. Laurer's canal opening in left submedian line at level of ovary. Uterus coiled from side to side between anterior testis and acetabulum, overreaching ceca ventrally and separated from lateral edge of body by a narrow strand of vitelline follicles. Matraterm alongside cirrus pouch. Eggs elliptical, light brown, 63-78 \times 39-45 μ ; contained ovum not segmented. Vitelline follicles extending along ceca, mostly on their outer side, from level of pharynx to posterior extremity, surrounding esophagus and preacetabular and posttesticular portions of intestine. They are continuous across the median line dorsal to the cirrus pouch but separated by the excretory vesicle behind the posterior testis. Transverse vitelline ducts running at level of anterior end of ovary and forming in median line a moderately large reservoir, whose anteriorly directed distal end is curved toward the right to open into the germiduct. Excretory vesicle tubular, middorsal, reaching to level of ovary, giving rise to a pair of collecting vessels at level of anterior end of anterior testis, narrowed at its dorsoterminal opening.

This species resembles the preceding very closely, but differs from it in the sucker ratio, the slightly posterior position of the testes, etc.



Opecoelidae

Plagioporus acerinae (Pigulewsky, 1931)
syn. Lebouria acerinae Pigulewsky, 1931



"LEBOURIA ACERINAE NOV. SPEC."
FRAN PIGULEWSKY, 1931

Plagioporus alacer (Looss, 1901) ^{Price, 1934} ~~Nicoll, 1910~~

Lebouria alacris (Looss 1901) Nicoll 1910

Average size 1 mm. by 0.46.

Oral sucker 0.155

Ventral sucker 0.22 by 0.26, transversely oval

Sucker ratio, 3:5

Ventral sucker 0.46 mm. from anterior end, therefore nearer the center of the body than in L. varia.

Short pre-pharynx, large pharynx, esophagus slightly longer than the pharynx.

Cirrus sac extends only a short distance beyond the anterior border of the ventral sucker.

Post-testicular space only 1/6 body length. ~~Yolk~~

~~yolk~~ glands marginal in hind body and rarely extend to inner side of ceca. They do not unite in post-testicular space. Continuous at level of ventral sucker, extend across body anterior to ventral sucker. Usually extend to mid-pharynx. Eggs 81-88 by 41-54 μ .

Syn. *P. varius* (Nicoll, 1910) Price, 1934



"(LEBOURIA) ALACRIS Loos."
OF NICOLL, 1909

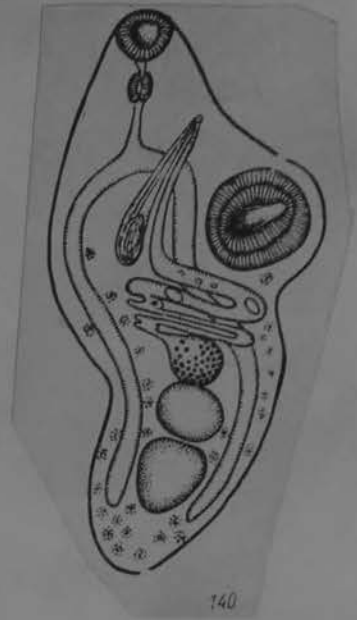


Fig. 2. *Diatomum alacris*
n. sp. von der Bauchseite.
Vergr. ca. 67.

From Looss, 1901. SEE REPRINT.

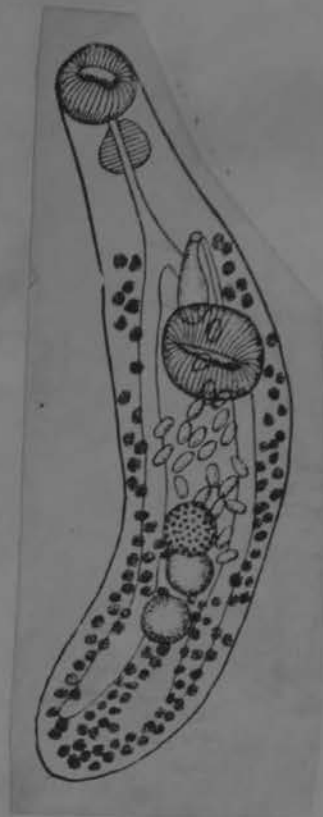
Opecoelidae

Plagioporus angulatus (Dujardin, 1845) Szidat, 1944



Opecoelidae

Plagioporus (Plagioporus) angusticolle (Hausmann, 1896)
Dobrovolny, 1939



Plagioporus angusticollis (Hausmann, 1896) Dobrovolny, 1939
(Pl. 33, b)

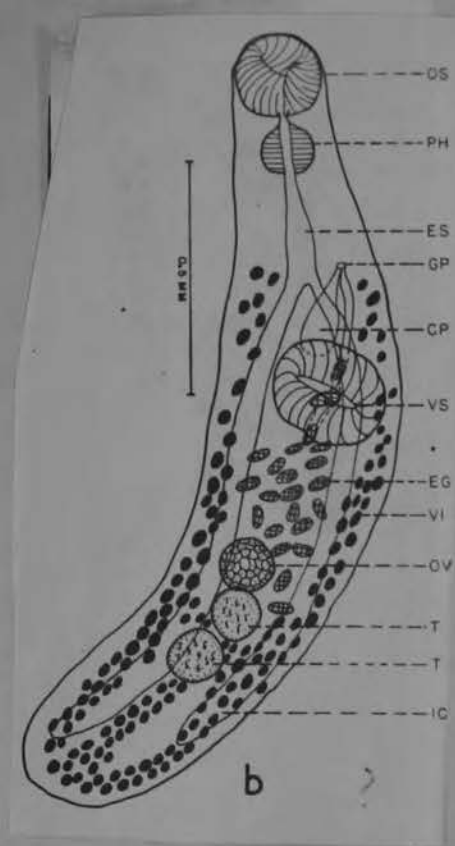
Host.—*Salmo gairdnerii*, in intestine.

In one large (30 cm.) rainbow trout taken from Boca Lake, Nevada County, three flukes were found in the posterior intestine. Although in size and general appearance the worms resemble *Crepidostomum farionis*, they have no oral papilla and are thus excluded from the genus *Crepidostomum*. The key to the genus *Plagioporus* given by Dobrovolny (1939) indicates that the species is *Plagioporus angusticollis*.

To date, as far as can be determined, this species has not previously been reported from North America.

The worms are somewhat larger than the measurements given in the original description by Hausmann (1896) and in that by Dawes (1946). However, the position of the organs and their size relative to that of the whole worm compare favorably with the original description. Apparently no figure of *Plagioporus angusticollis* has been published previously.

meat



incorrectly identified
by Hadlerie, 1953

Plagioporus apogonichthydis Yamaguti, 1938

Length: 1.6-2.25 mm.

Width: 0.55-0.85 mm. at about middle.

Oral sucker: Ventroterminal, 0.15-0.19 mm. in diameter.

Acetabulum: (size:) 0.24-0.3 mm. in diameter.
(position): At junction of anterior with middle third of body.

Sucker ratio: 1.6 to 2.

Esophagus: 0.09-0.13 mm. long, bifurcating about midway between 2 suckers
Pharynx: 75-87 X 78-105 μ .

Genital pore (location): Sinistral, at level of esophagus.

Testes, shape: Irregularly ovoid, with entire or indented surface.

location: Tandem; anterior slt. to left of median line at
Cirrus sac (extent): To a point dextro-junction of middle with posterior
Ovary, shape: Indented dorsal to acet. third of body; posterior median.
or lobed.

location: Immediately anterodextral to anterior testis.

Vitellaria: Surround intestine for its whole length except at level of
middle of acetabulum, commence at level of esophagus or
pharynx, often confluent dorsally in front of acetabulumEggs: Oval, light brown, and occasionally behind it.
thick-shelled, 54-57 X 30-35 μ .

Other features:

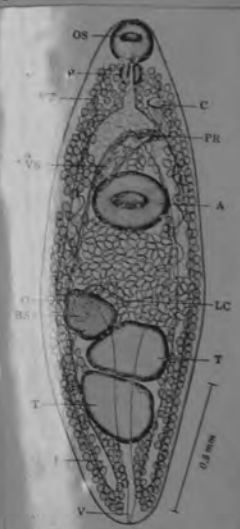
Host: *Apogonichthys carinatus* (Cuvier et Valenc.)

Locality: Koti. Japan.

Reference: Studies on the Helminth Fauna of Japan. Part 21.
Trematodes of Fishes, IV. Kyoto, Japan.Comparisons: P. japonicus Yamaguti, 1938

Life cycle:

$$\begin{array}{r} 16 \\ 15 \overline{)24} \\ \underline{13} \\ 90 \end{array}$$

$$\begin{array}{r} 2 \\ 19 \overline{)30} \end{array}$$
Fig. 7. *Plagioporus apogonichthydis*; ventral view.

PAPERNA, 1964

Plagioporus biliaris n.sp.

This new species appears in our material with two subspecies.

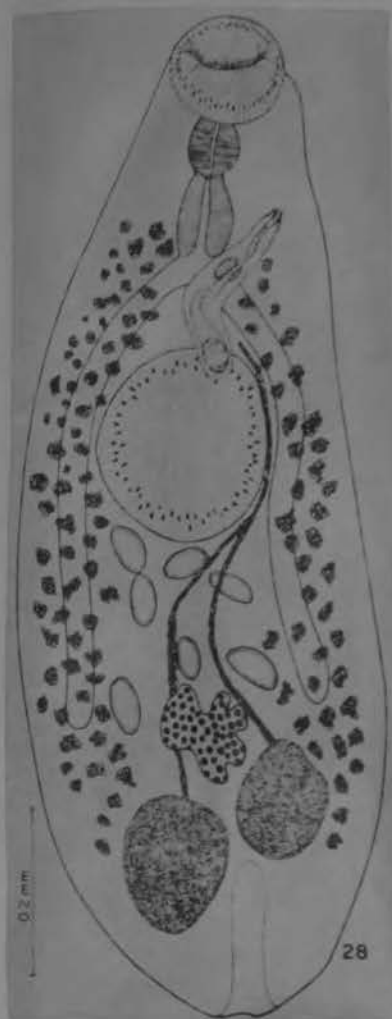
PAPERNA, 1964

Plagioporus biliaris biliaris n.sp.

(Figure 28)

Host: *Tilapia zilli* (Gervais), *Haplochromis flavi-josephi* (Lortet), *Tylognathus steinitziorum* gall bladder.
Locality: Lake Tiberias, springs in the Hule basin, streams of the coastal plain, Israel.
Material: No. 1992/Tr; Paratype: No. 1994/Tr.

Description. Body length 1.05–1.57 mm (from *T. steinitziorum* 1.85 mm). Width: 0.50–0.85 mm. Maximum diameter of the oral sucker is 0.17–0.26 mm. Pharynx is 0.07–0.14 mm long, the short oesophagus is 0.06–0.15 mm long and has thickened muscular walls (0.04–0.08 mm wide). Caeca reach the level of the ovary. Acetabulum, 0.2–0.35 mm, is situated in the anterior half of the middle of the body. Cirrus pouch is 0.2–0.26 mm long and 0.05 mm wide, its posterior extremity is covered by the acetabulum while its opening is located either to the left or to the right of the oesophagus. Vas deferens widens inside the cirrus pouch into a seminal vesicle. Prostatic glands are disposed inside the pouch. Testes are situated diagonally at the posterior extremity of the body, their diameter is 0.13–0.28 mm. The ovary is 0.11–0.2 mm in diameter and may be rounded or lobate. Vitellaria consist of delicate follicles, 0.02–0.03 mm in diameter, and are spread all over the body almost from the pharynx and till the posterior testis. Uterus winds mainly in the region between the testis and the acetabulum. Eggs are few, 0.070–0.080 × 0.035–0.040 mm in size.



PAPERNA, 1964

Plagioporus biliaris fluviatilis n. sp.
(Figure 29)

Host: *Varicorhinus damascinus* Cuv. Val., *Phoxinellus kervillei* Pellegrin.

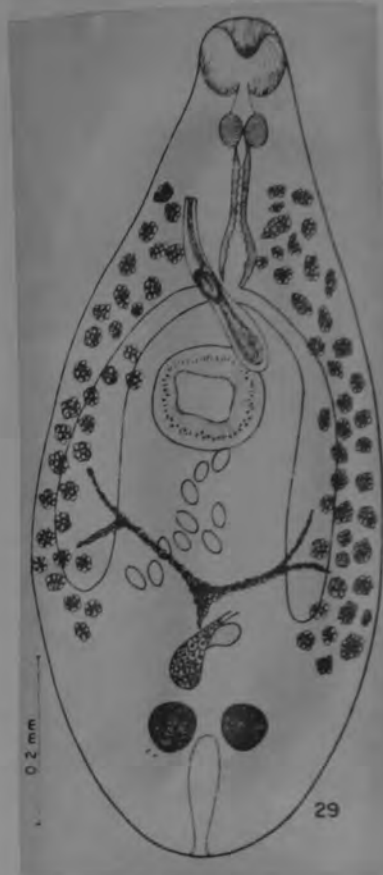
Habitat: gall bladder.

Locality: upper flow of the Jordan, Israel.

Holotype: No. 2074/Tr; *Paratype:* No. 2084/Tr.

Description (according to examination of 5 specimens). Body length 1.2–2.1 mm, width 0.41–0.9 mm. The oral sucker has a diameter 0.14–0.2 mm, pharynx 0.06–0.12 mm. Short prepharynx is 0.01–0.03 mm long, the oesophagus is 0.2–0.33 mm wide and has thickened muscular walls which widen at the anterior and posterior ends (width: 0.05–0.09 mm). Caeca reach the level of the ovary. Acetabulum, 0.18–0.27 mm in diameter, is situated before the middle of the body. Cirrus pouch 0.23–0.5 mm long, 0.05–0.08 mm wide, opens either on the left or on the right side of the oesophagus. Testes are comparatively small. Diameter of the first testis is 0.11–0.12 mm, of the second one 0.09–0.1 mm; both are situated side by side at the posterior extremity of the body. The ovary is oval, of approximately an equal size as the testes. Close to the ovary there is a rounded seminal receptacle and triangular vitelline receptacle into which open the two vitelline collecting ducts. Vitelline follicles are somewhat larger than in the former subspecies, 0.07 mm in diameter, they spread all over the body from the pharynx up to the posterior testis. Uterus winds mainly between the ovary and the acetabulum. Eggs are few, and 0.07–0.08 × 0.03–0.04 mm in size.

Discussion. *P. biliaris* closely resembles *P. sinitzini* Mueller, 1934, found in the gall bladder of fishes of the genus *Catostomus* in U.S.A., it differs from it mainly in its hosts and geographical distribution, in the size of the body and in the topographical arrangement of some organs, mainly the testes. The similarity between these species, in spite of different hosts and different geographical distribution, may have risen as a result of a convergent development in similar habitat, i.e., in the gall bladder of fishes. *P. biliaris fluviatilis* differs from *P. biliaris biliaris* mainly in the size and shape of the oesophagus, testes and vitellaria. *P. biliaris* resembles much *P. sinitzini huroni* Dubrov, 1939, while *P. b. fluviatilis* resembles *P. sinitzini* s. str. Mueller, 1934.



Flagiosporus branchiostegi Yamaguti, 1937

Body fusiform, with blunt-pointed extremities, 0.86 long with maximum breadth of 0.32 at middle. Cuticle thin, unarmed. Oral sucker subterminal, 0.09x0.09. Prepharynx very short. Pharynx 50 μ long by 60 μ broad. Esophagus 60 μ long, bifurcating about midway between oral sucker and acetabulum. Intestine simple, reaching to posterior end of body. Acetabulum 0.2 in diameter, equatorial. Testes oval, 0.09-0.1x 0.08-0.09, oblique (left one in front), in middle of hindbody. Cirrus pouch slender, 0.3 long by 30 μ broad, extending in a gentle curve across beginning of left cecum to right margin of acetabulum. Vesicula seminalis elongate, bending back on itself at its anterior end. Ductus ejaculatorius long. Pars prostatica not differentiated. Genital pore ventral, close to left margin of body at level of pharynx.

Ovary subglobular, 0.09x0.08, opposite and anterior to left (anterior) testis. Uterus reaching to posterior testis, containing a dozen oval eggs, 57-69x36-39 μ . Metratrum well differentiated, crossing cirrus pouch on ventral side of left cecum. Vitellaria follicular, surrounding posterior portion of esophagus and entire length of intestine.

The excretory system and shell gland complex were unable to make out.

Remarks. This species differs from the closely related Flagiosporus alacris (Loos, 1901) in the size of the body and eggs, and from F. sinitzini Mueller, 1934, in the host. Also from F. varius (Nicoll, 1910) in the size of the body and eggs. It seems to occur very rarely, inasmuch as it has been found in only two hosts out of more than two hundred.

Host: Branchiostegus japonicus (Houttuyn)
a marine fish: Sea of Japan
(Pacific)



Fig. 6. Flagiosporus branchiostegi, ventral view.

Allocreadiidae
Allocreadiinae

Flagioporus calotomi (Yamaguti 1934) Yamaguti, 1938
Synonym: Lebouria calatomi Yamaguti 1934

Size 1.44 by 0.48 mm. Preoral lip and cervical glands present. Oral sucker 0.12 by 0.19 mm. Prepharynx short. Pharynx 0.084 by 0.096 mm. The esophagus is about 0.08 mm. long, bifurcating midway between suckers. Ceca end near the posterior end. Acetabulum 0.24 by 0.25 mm., just in front of midbody.

Testes oval transversely, midway between acetabulum and posterior end. Anterior testes 0.18 by 0.21 mm. (text says it is just in front of midbody)... then repeated.. typographical error. Cirrus pouch slightly curved, club-shaped, ~~0.15 by 0.054 mm.~~ 0.15 by 0.054 mm. Seminal vesicle a simple elongate sac. Genital pore to the left at level of pharynx.

Ovary subglobular, 0.13 by 0.15 mm., on the right anterodorsal side of the anterior testis. Sem. rec. present. Laurer's canal present. Uterus overlapping anterior testis slightly. Eggs 31 by 21 μ in living condition. Truncated at one end.

Vitellaria begin at posterior end of pharynx, confluent anterior to acetabulum and posterior to hind testis.

Host: intestine of Calotomus japonicus (Cuv. & Val.)

Differs from all other species in large size of eggs. Also the structure of the seminal vesicle and the pars prostatica.

The truncated shape of the eggs also occurs in L. varia and L. alacris

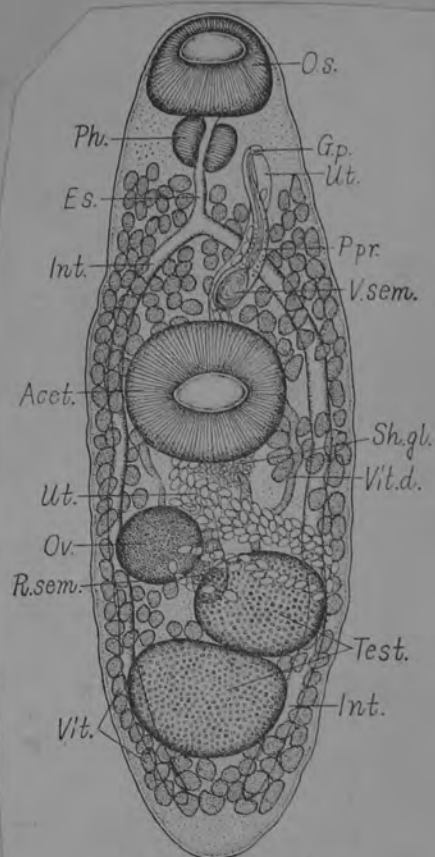


Fig. 18. Lebouria calotomi;
ventral view.
Type 1.44 x 0.48 mm.

*Plagioporus**Lebouria choerodonis* ~~n. sp.~~ (Yamaguti, 1934) Yamaguti, 1938

Specific Diagnosis (from S. Yamaguti, 1934)

Lebouria, Nicoll, 1909; with generic characters. Body 1.47-2.1x0.36-0.56 mm, oral sucker 0.13-0.19x0.17-0.2mm, pharynx 0.12-0.13x0.15mm, acetabulum at anterior end of middle third of body, 0.17-0.27x0.21-0.28mm. Testes tandem, pressed against each other, in posterior part of body, somewhat irregular in shape, 0.17-0.28x0.16-0.26mm. Cirrus pouch extending posteriorly to level of middle or posterior border of acetabulum. Genital pore submedian, at level of posterior part of esophagus. Ovary transversely elongate, 0.1-0.14x0.17-0.34mm, irregularly indented posteriorly, overlapping anterior testis. Uterus transversely coiled, extending into extracecal field. Eggs small, averaging 0.0237x0.0132mm in life.

Habitat . Small intestine of *Choerodon azurio* (Jord. et Snyder.)
Locality and date. Inland Sea; August 31, 1932

~~Types and paratypes in my collection.~~

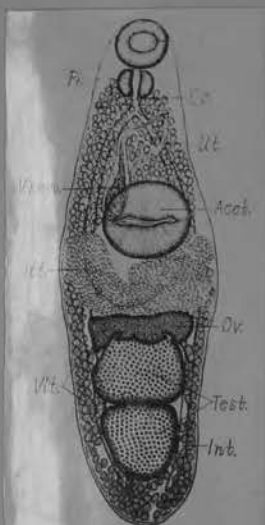


Fig. 17. *Lebouria choerodonis*;

as m. rec. p. Leland present

Plagioporus chrysophrys n. sp.

(Fig. 1)

Nagaty & Takia M. Abdel Aal, 1969

The description was based on whole mounts of four specimens from *Chrysophrys bifasciata* locally called «Rabaga».

Body elongate, 2.39-4.33 long and 1.01-1.68 wide; narrow anteriorly and broad posteriorly. Cuticle slightly annulate throughout whole body. Oral sucker 0.36-0.57, slightly sub-terminal. Pre-pharynx narrow 0.09-0.20; pharynx 0.20-0.47 by 0.23-0.38; oesophagus nearly 0.08 long. Intestinal caeca extending near posterior extremity; terminating nearly at 0.35 from posterior end of body. Ventral sucker 0.50-0.77 by 0.65-1.01 in anterior half of middle third of body length; 0.35-0.95 from oral sucker. Ratio of oral to ventral suckers is 0.6 : 1.

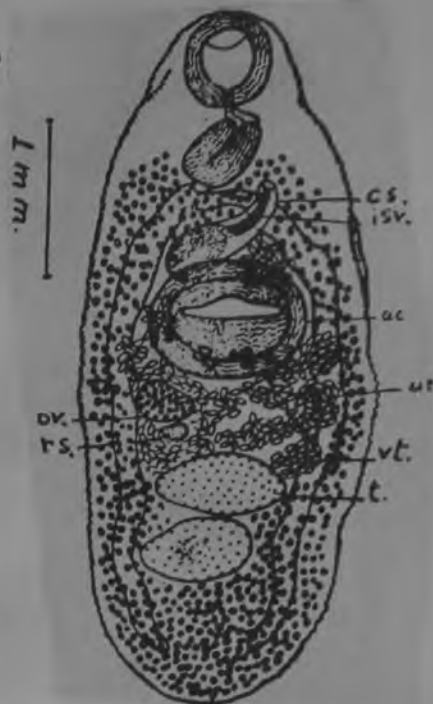
Testes, two, intercecal, obliquely tandem and close to each other, in middle of posterior half of body length, smooth-contoured and transversely elongate, anterior testis 0.26-0.39 by 0.45-0.80, posterior testis 0.24-0.44 by 0.45-0.78. Cirrus pouch curved, nearly club-shaped, posterior border slightly overlapped by anterior border of acetabulum, containing elongate sinuous vesicula seminalis. Genital opening at level of pharynx and to the left of mid-line.

Ovary transversely elongate 0.18-0.26 by 0.24-0.39, intercecal, towards right side of median line, posterior to acetabulum and separated from it by uterine coils, in middle third of body length. Receptaculum seminis immediately posterior to ovary measuring 0.017-0.018 by 0.024. Vitellaria composed of numerous small follicles partly extra and partly overlapping ceca. Extending anteriorly to level of pharynx, and occupying transversely whole body at region of intestinal bifurcation. Posteriorly they come together and occupy whole posterior part. Uterus occupy area between acetabulum and anterior testis interceally; metraterm not distinct. Eggs oval, averaging 0.08 by 0.05.

Excretory system not distinct.

Affinities: This species resembles *P. isaitschikowi* (Layman, 1930) but differs from it in having: (1) vitellaria not interrupted on either side of acetabulum; (2) posterior border of cirrus pouch overlapped by anterior border of acetabulum instead of being anterior to acetabulum; (3) receptaculum seminis, post-ovarian instead of being dorsal to ovary and (4) intestinal caeca terminating near posterior end of body instead of extending a little beyond posterior testis.

It differs from *P. japonicus* Yamaguti, 1938 in having: (1) ovary anterior to anterior testis and separated from it by uterine coils instead of being antero-dextral to anterior testis; (2) testes tandem instead of being diagonal; (3) receptaculum seminis post-ovarian instead of being dorsal to ovary and (4) posterior border of cirrus pouch overlapped by acetabulum instead of extending anterior to it.



104. *Plagioporus (Plagioporus) congeri* n. sp. Yamaguti, 1970
(Fig. 68)

HABITAT: Intestine of *Conger* sp.; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63582.

DESCRIPTION (based on six whole mounts): Body elongate, 1.4-2.3 mm long, tapered anteriorly in forebody, but nearly cylindrical in hindbody, with maximum width of 0.4-0.5 mm at level of acetabulum. Cuticle thin, smooth. Oral sucker terminal, with subterminal aperture, 0.12-0.16 × 0.12-0.18 mm; prepharynx 30-50 μ long; pharynx comparatively large, 80-160 × 90-150 μ; esophagus 0.15-0.28 mm long, bifurcating a little in front of acetabulum; ceca simple, wide, ending blindly near posterior extremity. Acetabulum 0.3-0.35 mm in diameter, surrounded by puckered body fold projecting forward beyond anterior margin of sucker in the type, situated at junction of anterior with middle third of body. Sucker ratio 1 : 1.4-3.0.

Testes oval, entire, directly tandem, 0.17-0.2 × 0.11-0.17 mm; anterior one lying at anterior end of caudal third of body or a little more anteriorly. Cirrus pouch claviform, curved, 0.18-0.25 × 0.06-0.1 mm, with its enlarged posterior part between acetabulum and intestinal bifurcation; seminal vesicle elliptical, constricted or not, 50-70 μ wide; pars prostatica not well differentiated, although prostate cells are present around ejaculatory duct. Cirrus smooth, conical, 42 μ long, 30 μ wide at base in the type, projecting out of genital pore. Genital pore near left margin of body at level of intestinal bifurcation.

Ovary heart-shaped, indented posteriorly, 0.06-0.18 × 0.1-0.16 mm, slightly to right of median line immediately in front of anterior testis. Laurer's canal arising as direct continuation of seminal receptacle, opening dorsal or sinistral to ovary. Seminal receptacle elongate, pre-ovarian, connected with germiduct sideways. Uterine coils confined to intercecal field between ovary and acetabulum; metraterm commencing halfway between ovary and acetabulum, very wide proximally, but narrow distally. Eggs oval, 60-70 × 35-46 μ in life. Vitellaria extending along ceca from acetabular level to posterior extremity, confluent in posttesticular area; vitelline ducts forming H-shaped pattern; vitelline reservoir triangular, anterodorsal to ovary, joining germiduct after the latter turns back on itself anterior to its connection with seminal receptacle. Excretory vesicle tubular, reaching to dorsal side of ovary; pore terminal.

DISCUSSION: This species resembles *Plagioporus isaitschkowi* (Layman, 1930) most closely in shape and size of body and in internal anatomy, but differs from it in the posterior position of the genital pore and the posterior extent of the intestinal limbs.



68 A



68 B

27. *Plagioporus dactylopagri* n. sp. *Manter, 1954*
(Fig. 35)

HOST: *Dactylopagrus macropterus* (Forster), tarakihi; intestine.
LOCALITY: Portobello.

HOLOTYPE: U.S. Nat. Mus. Helminth. Collection No. 49131.

DESCRIPTION (based on two specimens, one extended, the other [Fig. 35] moderately contracted): Length 1.432 to 1.834 mm.; anterior end rounded; posterior end not tapered, subtruncate. Greatest width 0.385 to 0.672 mm. near acetabular level but most of body almost equally wide. Forebody 0.455 to 0.462 mm. or about $\frac{1}{4}$ to $\frac{1}{3}$ body length. Oral sucker 0.161 to 0.231 mm. wide; acetabulum slightly wider than long, 0.269 to 0.369 mm. wide. Sucker ratio 1 : 1.6 to 1.66. Pharynx 0.125 by 0.125 mm. in the 1.834 mm. specimen. Oesophagus not observed, probably very short. Caeca extending slightly past testes to posterior end of body.

Genital pore to left of oral sucker; in one case almost at mid-sucker level, in the other (extended specimen) it is very inconspicuous but judging partly from the location of the prostatic vesicle, it lies to the left of posterior fifth of oral sucker. Testes smooth, subspherical, tandem, in posterior third of body, close together, large, filling intercaecal space. In one specimen (Fig. 35) the posterior testis was partially degenerate. Posttesticular space short, 0.154 to 0.269 mm. or about $\frac{1}{7}$ to $\frac{1}{5}$ body length. Cirrus sac claviform, curving from the right anterior edge of acetabulum to genital pore; containing a tubular seminal vesicle looped once, an ovoid prostatic vesicle the base of which is a little posterior to middle of the sac, a rather long cirrus, and a few prostatic cells. Ovary transversely ovoid, smooth, immediately pretesticular, slightly to the right. Vitelline follicles large, extensive, from posterior third of oral sucker or from midpharynx level to extreme posterior end of body; confluent dorsally in forebody and posterior to testes; dorsal, ventral and lateral to caeca. In both specimens, the vitelline follicles were interrupted briefly opposite the acetabulum on the left side only. Uterus pretesticular, with a few wide coils. A thin-walled claviform metraterm about half as long as the cirrus sac could be seen in one specimen. Under high power, an appearance of fairly long fine spines near the base of the metraterm was seen but it hardly seems possible that such spines could be present. Eggs 44 to 47 by 24 to 27 μ . Excretory system not observed.

DISCUSSION: Of the numerous species named in the genus *Plagioporus* only *P. preporatus* has the genital pore so far anterior. But *P. preporatus* is very different in its long posttesticular space, tapered posterior end, sucker ratio, lobed testes, and smaller eggs. The most closely related species seem to be *P. pacificus* Yamaguti, 1938; *P. ira* Yamaguti, 1940; *P. japonicus* Yamaguti, 1938; *P. calotomi* (Yamaguti, 1934); and *P. isaitschikowi* (Layman, 1930) all from the North Pacific. In all of these the genital pore is rather far forward although not reaching the oral sucker. In most of them the eggs are much larger (57 to 90 μ long) while in *P. pacificus* and *P. calotomi* the eggs are much smaller (24 to 31 μ long).



Plagioporus

Lebouria elongata (Goto & Ozaki 1930) Price, 1984

Body elongate, flattened, 1.12-1.49 mm. by 0.31 -0.38 mm.
Rounded anteriorly, rather pointed posteriorly.

Oral sucker 0.12-0.14 mm. in diameter

Ventral sucker 0.18-0.21 mm. at hind end of anterior half.

Testes one close behind the other in posterior quarter.

Genital pore midway between median line and left margin,
between pharynx and intestinal bifurcation.

Cirrus sac elongate clavate, extending to the anterior
border of the ventral sucker. Posterior half of cirrus
sac containing a large seminal vesicle.

Ovary on right in front of anterior testis, with 4-6
peripheral lobes. Sem. rec. pear-shaped sinistro-dorsal
to the anterior testis.

Vitellaria of oval follicles surrounding ceca on external,
ventral and dorsal sides, extending from level of genital
pore to posterior end, coalescing in front of ventral
sucker.

Uterus short, eggs large and few, light yellow with thin
shell, long oval; 90-98 by 57-60 μ .

Host: intestine, Sarcocheilichthys variegatus

Locality: Lake Biwa, Japan

Differs from other species in shape of ovary and position
of testes which in other species are further forward and
more oblique



Lebouria elongata
from Goto & Ozaki

PLAGIOPORUS FUSIFORMIS, ~~n. sp.~~ Price, 1934

Plate 1, fig. 4

Description.—Body fusiform, 1.27 to 1.7 mm long by 475 to 680 μ wide at level of acetabulum, slightly flattened dorso-ventrally. Cuticula delicate, unarmed. Oral sucker 120 to 152 μ in diameter; acetabulum 220 to 340 μ long by 280 to 576 μ wide, in equatorial zone. Prepharynx 20 to 40 μ long; pharynx 40 to 60 μ long by 40 to 80 μ wide; esophagus 200 to 240 μ long; intestinal ceca simple, extending to level of posterior testis. Excretory aperture terminal; excretory vesicle tubular, extending anteriorly as far as level of anterior testis. Genital aperture near left margin of body and about midway between pharynx and intestinal bifurcation. Cirrus pouch slender, about 300 μ long, its base lying in median line dorsal to acetabulum, and containing a slender unarmed cirrus, prostate cells, and a slender, somewhat convoluted seminal vesicle; a distinct pars prostatica apparently absent. Testes elongated transversely, tandem and in contact, in anterior part of posterior third of body; anterior testis about 80 μ long by 240 μ wide; posterior testis 120 μ long by 240 μ wide. Ovary trilobed, about 60 μ long by 180 μ wide, pretesticular, mostly to right of median line. Seminal receptacle and Laurer's canal present, the latter opening in the mid-dorsal line at level of ovary. Vitellaria extending from level of genital aperture to about half way between posterior testis and posterior end of body. Uterus with relatively few coils, preovarial; metraterm extending from near center of acetabulum to genital aperture. Eggs oval, 70 to 72 μ long by 36 μ wide, with thin, yellowish shells.

Host.—Eel (*Xenomystax* sp.) (J-S 447 and 448).

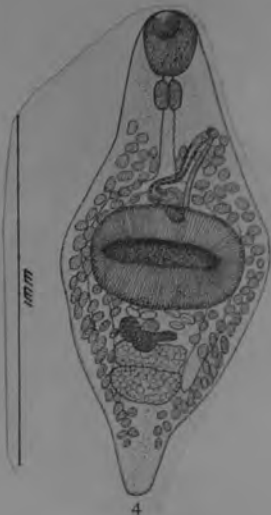
Location.—Intestine.

Locality.—Station 84 (lat. 18°39' N., long. 65°17' W.).

Type specimen.—U.S.N.M. Helm. Coll. no. 8716; paratypes no. 8717.

Plagioporus fusiformis appears to be more closely related to *P. serotinus* Stafford than to any of the other species so far placed in the genus, but differs from that species in the length of the ceca which in *P. fusiformis* extend only to the level of the posterior testis, whereas in *P. serotinus* they extend to the posterior end of the body.

In comparing the species of the genus *Plagioporus* Stafford with those included in the genus *Lebouria* Nicoll the writer is convinced that the latter are congeneric with *P. serotinus*, type of *Plagioporus*. Stafford's (1904) description of *P. serotinus* is rather meager, but all of the generic characters are clearly indicated; therefore, the writer transfers the species *Lebouria aducta* Nicoll, *L. acerinae* Pigulevsky, *L. alacris* (Looss), *L. cooperi* Hunter and Bangham, *L. crassigula* Linton, *L. elongata* Goto and Ozaki, *L. idonea* Nicoll, *L. isaitschikovi* Layman, *L. nicolli* Isaitschikov, *L. obducta* Nicoll, *L. tumidulum* (Rudolphi), and *L. varia* Nicoll to the genus *Plagioporus*, the new combinations being, respectively, *P. aducta* (Nicoll), *P. acerinae* (Pigulevsky), *P. alacris* (Looss), *P. cooperi* (Hunter and Bangham), *P. crassigula* (Linton), *P. elongata* (Goto and Ozaki), *P. idonea* (Nicoll), *P. isaitschikovi* (Layman), *P. nicolli* (Isaitschikov), *P. obducta* (Nicoll), *P. tumidulum* (Rudolphi), and *P. varia* (Nicoll).



From the above species, which up to the present time have been included in the genus *Lebouria*, *Plagioporus fusiformis* may be distinguished by the distinctly fusiform shape of the body and by the very large, equatorially placed acetabulum. In the extent of the intestinal ceca posteriorly, this form resembles *P. nicolli* and *P. cooperi* more than the others; *P. fusiformis* may be differentiated from *P. nicolli* in that loops of the uterus pass between the ovary and testes in the latter species, a condition not occurring in *P. fusiformis* or in any of the other species of the genus. *P. fusiformis* differs from *P. cooperi* in having a larger and more equatorially placed acetabulum, in having the genital aperture situated more anteriorly and nearer the body margin, and in having the testes tandem in position instead of being placed diagonally as in *P. cooperi*.

Plagioporus gerridis sp. n.
(Figs. 13-14)

HOST: *Gerres nigri* Günther, mojarra (Liongnathidae).

HABITAT: Small intestine.

LOCALITY: Cape Coast, Ghana.

DATE: 17 February 1966.

SPECIMENS: USNM Helm. Coll. No. 70679 (holotype); No. 70680 (paratypes).

DIAGNOSIS (based on seven adults from one of three fish examined; five measured): Body elongate, robust, unspined, extremities round, with body fold anterior to acetabulum in some but absent in others, 550-815 by 177-300 at gonadal level. Forebody conical, 148-195 long; hindbody 290-460 long; forebody-hindbody length ratio 1:1.7-2.4. Oral sucker subterminal ventral, nearly round, 73-94 by 70-87; acetabulum tending to be flat at anterior, posterior and lateral surfaces, corners round, aperture a transverse slit, muscle fibers extending from surface of acetabulum onto body proper, 110-160 by 116-160. Sucker length ratio 1:1.51-1.88, width ratio 1:1.66-1.90. Postoral circular muscle ring narrow. Prepharynx 12 long (in one); pharynx nearly round, 53-58 by 48-58; esophagus 30-63 long; cecal bifurcation just anterior or dorsal to acetabulum; ceca terminating posttesticularly near posterior extremity.

Testes two, smooth, diagonal, contiguous, sometimes overlapping slightly, overlapping ceca ventrally, in anterior to middle two-thirds of hindbody. Anterior testis sinistromedian, round to longitudinally elongate, 123-145 by 102-133, overlapping acetabulum up to 18 to lying up to 89 postacetabular; posterior testis median, round to longitudinally or transversely elongate, 114-161 by 111-160, lying 53-182 postacetabular; posttesticular space 90-140 long. Cirrus sac sinuous, usually with dextral U-shaped bend dorsal to acetabulum, commencing 31-121 postacetabular, usually median between ovary and anterior testis, sometimes ventrolateral to ovary, overlapping gonads ventrally at its position. Seminal vesicle bipartite; posterior part saccular, overlapping posterior part of acetabulum, 87-141 by 27-60; anterior part tubular, sinuous. Pars prostatica relatively long, commencing dorsal to anterior part of

acetabulum or entirely preacetabular. Cirrus muscular, shorter than pars prostatica except when protruded through genital pore. Latter sinistral, at level of pharynx or anterior part of esophagus.

Ovary smooth, dextral to anterior testis, usually separated from anterior testis by uterus but may be contiguous with it, contiguous with posterior testis, usually longitudinally elongate, 77-109 by 58-121, lying 5-78 postacetabular, anterior margin 8-25 posterior to anterior margin of anterior testis in six worms and 11 anterior in one. Ootype complex anterodorsal to ovary. Seminal receptacle large, dorsal to ovary, longitudinally elongate, 63-141 by 40-62. Uterus short, coils few, may overlap all gonads. Metraterm short, slightly muscular, surrounded by gland cells. Vitelline follicles large, smooth, commencing at cecal bifurcation or slightly anteriorly, filling posttesticular space, lateral anteriorly, confluent dorsally throughout length of fields. Vitelline reservoir dorsomedian between and overlapping ovary and anterior testis. Eggs large, yellow-brown, operculate, partially collapsed, 11 measuring 53-64 by 30-39.

Excretory bladder unbranched, tubular, extending anteriorly to ovary-anterior testis level; pore terminal.

DISCUSSION: In having the ovary opposite the anterior testis our species appears closest to *Plagioporus triangulogenitalis* Belouss, 1958, from a cyprinid fish, and *P. glomeratus* Roitman, 1963, from cyprinid, salmonid and thymallid fishes; both species are from the maritime region of eastern Siberia. In the key to the subgenus *Plagioporus* (Stafford, 1904) given by Skrjabin and Koval (1958) our form keyed to *P. (P.) calotomi* (Yamaguti, 1934) Yamaguti, 1938, from scarid fishes from Japan. Our new species differs significantly from the three species listed above in the postacetabular extension of the cirrus sac, the presence of a bipartite seminal vesicle, and the vitellaria being confluent dorsally throughout the length of the fields.



Plagioporus glomeratus Roitman, 1963

Host: Rhodeus sericeus, Acanthorhodeus asmussi,
Phoxinus czekanowskii, P. lagowskii,
Brachymystax lenok, Thymallus arcticus
grubei

in reprint



Рис. 3. *Plagioporus glomeratus*
nov. sp.

Plagioporus hypentelii sp. n.

(Fig. 1)

From Hendrix, 1993

DESCRIPTION: Body lanceolate, aspinous, length 837 (520–1162); width at acetabulum 251 (152–300). Acetabulum in anterior part of middle third of body, length 191 (152–232), width 202 (174–240). Oral sucker subterminal, length 100 (72–120), width 106 (84–129); prepharynx very short; pharynx length 50 (42–57), width 46 (38–56); esophagus length 64 (42–90), width 21 (14–27). Intestinal bifurcation preacetabular; intestinal crura extending to near posterior end of worm, width 27 (20–35). Excretory bladder short, reaching the posterior testis, length 121 (75–187), width 45 (40–53) (six bladders measured); flame cell formula $2[(2+2) + (2+2)] = 16$. Testes postacetabular, tandem, foretestis length 104 (68–144), width 148 (120–188); hind testis length 117 (81–180), width 142 (101–196). Cirrus sac elongate, partially anterior to acetabulum, length 199 (120–255), width 56 (45–72); containing seminal vesicle, length 125 (58–195), width 56 (42–72). Prostate complex leading to genital pore which is on left of midline just anterior to cecal bifurcation. Cirrus short, eversible, unarmed. Ovary just postacetabular and dextral, length 66 (38–104), width 88 (68–115). Seminal receptacle, Laurer's canal, ootype, and Mehlis' gland present. Vitelline reservoir triangular in shape, length 71 (53–106), width 43 (24–63). Uterus extending from ootype anteriorly; metraterm short, joining ejaculatory duct just prior to genital pore. Vitelline follicles numerous, mainly in two lateral bands from region of esophagus to near posterior extremity, length 37 (17–78), width 24 (9–38) (125 follicles measured). Eggs usually fewer than 20 in number, uterine egg length 58 (45–71), width 33 (26–41) (62 eggs measured).

HOST: *Hypentelium nigricans* (LeSueur).

LOCATION IN HOST: Middle and posterior thirds of intestine.

INCIDENCE: Of 34 *H. nigricans* examined 31 were infected with from one to 460 (mean 72.5) specimens of *P. hypentelii*.

LOCALITIES: Marsh Creek (US 30) and Middle Creek (US 15), Adams County, Pa.

HOLOTYPE: USNM Helm. Coll. No. 72458.

PARATYPE: USNM Helm. Coll. No. 72459.

Discussion

There are currently seven species of *Plagioporus* from North American freshwater fishes. They include the following: *P. angusticolis* (Hausmann, 1896) Dobrovolny, 1939, in *Salmo*; *P. cooperi* (Hunter and Bangham, 1932) Price, 1934, in *Amocrypta*, *Cottus*, *Etheostoma*, *Gila*, *Notropis*, *Rheocrypta*, and *Richardsonius*; *P. macrouterinus* Haderlie 1953, in *Ptychocheilus*; *P. serotinus* Stafford, 1904, in *Moxostoma* and *Archoplites*; *P. serratus* Miller, 1940, in *Hiodon*; *P. siliculus* Sinitzin, 1931, in *Salmo*; *P. sinitsini* Mueller, 1934, in *Camptostoma*, *Catostomus*, *Hyporhynchus*, *Hypentelium*, *Nocomis*, and *Notropis*; also *Plagioporus* sp. in *Salmo* and *Ictalurus* (Hoffman, 1967).

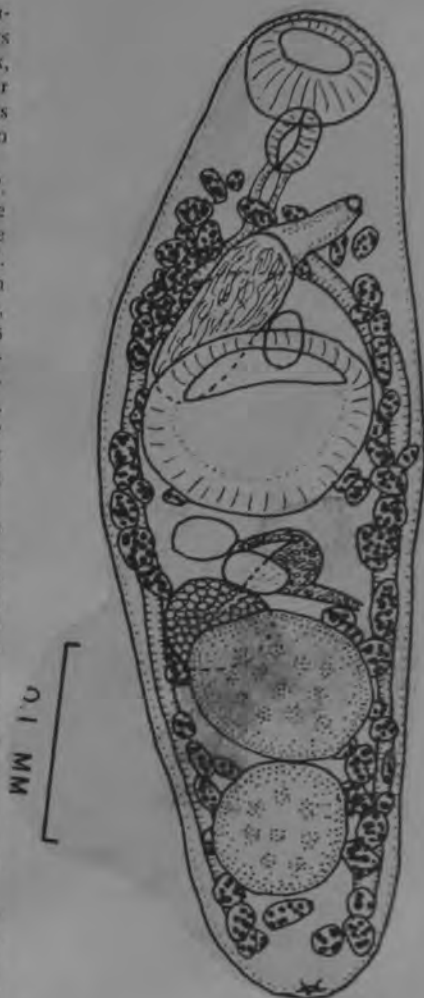
Plagioporus hypentelii differs from *P. angusticolis*, *P. macrouterinus*, and *P. siliculus* in its smaller size, smaller oral sucker, pharynx, ovary, testes, and cirrus sac. It differs further from *P. macrouterinus* in having smaller eggs and a uterus that does not extend posterior to the anterior margin of the foretestis.

P. hypentelii differs from *P. sinitsini* and *P. serratus* in location within the fish host. The latter two are found in the gall bladder while *P. hypentelii* is found only in the intestine. *P. hypentelii* differs further from *P. sinitsini* in its smaller acetabulum, oral sucker, pharynx, and eggs. *P. hypentelii* differs from *P. serratus* in being aspinous, having a larger body, acetabulum, oral sucker, and pharynx, in the position and larger size of the testes, and in host.

P. hypentelii differs from *P. cooperi* in body shape, shorter pharynx, smaller and fewer eggs, longer intestinal crura, and in the host and geographic location.

In the key for the subgenus *Plagioporus* (Stafford, 1904) in Arai and Dooley (1964), my specimens keyed to *P. serotinus*. This is also true for the key to the North American species of *Plagioporus* given by Miller (1940). Although *P. hypentelii* is found in the intestine of the common white sucker, *Catostomus commersoni* (Lacépède), sampled at different seasons, it does not attain sexual maturity in this host, while *P. serotinus* does. *P. hypentelii* differs further from *P. serotinus* in its less elongate shape, smaller body, testes, ovary, and eggs, and in having a straight rather than S-shaped cirrus sac. In addition to the above, *P. hypentelii* has a different host and host locality.

Based upon morphological criteria, two other species of North American *Plagioporus* have been removed from the genus by Pritchard (1966). These are now *Allopedocotyle lepomis* (Dobrovolny, 1939) and *A. circus* (Sinitzin, 1931). I agree that these two species do not belong in the genus *Plagioporus*.



Plagioperus idoneus (Nicoll, 1909)

Lebouria idonea Nicoll 1909:441

Host: Anarrhichas lupus

Size 1.5 to 2.5 mm. by 0.7 to 1. mm. (breadth nearly half the length). Shape oval, slightly attenuated anteriorly. Oral sucker subterminal, 0.17 to 0.28 mm. Ventral sucker nearly in the middle of the body, transversely oval. 0.41-0.58 (about twice the size of the oral sucker). Prepharynx, pharynx, esophagus about the length of the pharynx. Intestinal bifurcation almost midway between the suckers. Excretory vesicle simple, not extending further forward than anterior testis. Testes transversely oval, contiguous, oblique.

Anterior testis slightly to the left. In some specimens they were tandem, nearly equal in size or posterior a little larger. Cirrus sac extends only a short distance over the anterior border of the ventral sucker. Seminal vesicle internal, convoluted. Prostate cells little developed. Genital pore midway between suckers just over the intestinal bifurcation. In most specimens median, in some a little to the left. Ovary round, entire, in front of and to the right of anterior testis. Position of the seminal rec. variable, dorsal, anterior or posterior to ##### ovary. L. canal present. Yolk glands lateral from pharynx to posterior end. Anteriorly a few follicles are contiguous dorsally but not ventrally. Uterus between ovary and ventral sucker. Metratrem shorter than cirrus sac. About 60 eggs., 71-74.6 μ by 34 to 43 μ , average 73 by 41 μ

Lebouria differs from Podocotyle in median genital pore; from Helicometra in its non-filamented eggs; from Allocradium by oblique testes, posterior sucker; and absence of pars prostatica.



Plagioporus idoneus (Nicoll, 1909) Price, 1934

SYNONYM: *Leboreia idonea* Nicoll, 1909.

HOSTS AND LOCALITIES

Anarhichas lupus, intestine, (2/8).

Flemish Cap (47° N., 45° W.; depth 168 and 174 m).

Anarhichas minor, intestine, (1/1).

Funk Island Bank (50° N., 51° W.; depth 280 m).

Although not recorded in eastern Canadian waters before, this species is well known as a parasite of *Anarhichas* spp. in western Greenland, the northeast Atlantic Ocean and the Barents Sea. It has also been recorded from sparid, labrid and maenid fishes in the Adriatic Sea (Sey 1970) and the South Atlantic (Parukhin 1968). This may be due to confusion with *Plagioporus alacris* (Looss, 1901) and *P. varia* (Nicoll, 1910), both of which have been found in these families of fish, and both of which have been considered synonyms of *P. idoneus* by Koval (1959).

From BRAY, 1979

Plagioporus (Plagioporus) imanensis Belouss, 1958*Plagioporus (Plagioporus) imanensis* Belouss, 1958

(Рис. 151)

Хозяин: китайский гольян — *Phoxinus lagowskii oxycephalus*.

Локализация: кишечник.

Место обнаружения: СССР (Дальний Восток).

Описание вида (по Белоус, публикуется впервые). Тело трематоды продолговатое, передняя треть его клиновидно суживается по направлению к ротовой присоске. Длина трематоды 1,540 мм, наибольшая ширина в области передней половины брюшной присоски 0,80 мм. Кутанула тонкая. Ротовая присоска расположена терминально; длина ее 0,215 мм, ширина 0,210 мм. Брюшная присоска больше ротовой, совершенно круглой формы, диаметр ее 0,300 мм.

Фаринкс поперечно-овальный, находится дорзально от задней половины ротовой присоски; длина его 0,100 мм, ширина 0,145 мм.

Семенники крупные, слегка поперечно-овальные, лежат вблизи заднего края тела вплотную один за другим; они одинакового размера: длина 0,200, ширина 0,220 мм.

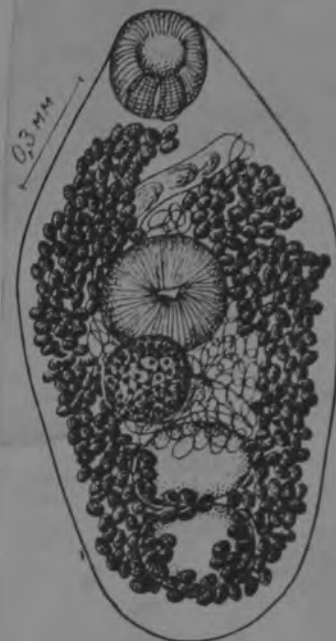
Половая бурса цилиндрическая, почти прямая, расположена целиком впереди брюшной присоски. Задний конец бурсы заходит вправо за медианную линию трематоды.

Яичник шарообразный, 0,160 мм в диаметре; расположен впереди и справа от переднего семенника; его передний край слегка заходит за задний край брюшной присоски. Буылковидный семяприемник лежит между передним семенником и яичником.

Матка расположена между передним семенником и половой бурсой. Желточники сильно развиты и состоят из довольно крупных фолликулов; широкими полосами они проходят по бокам трематоды, соединяясь между собой позади второго семенника небольшим числом фолликулов. Впереди левая полоса желточников густой широкой массой доходит до половой бурсы, правая же полоса желточников доходит почти до фаринкса и здесь, загибаясь влево, заходит за медианную линию трематоды. Этот признак является, по-видимому, характерным для данного вида, так как выражен у обоих изучавшихся экземпляров.

Яйца довольно крупные, овальные, светло-желтого цвета. Молодые яйца, находящиеся в начальных участках матки, почти белые, слабо-

30 К. И. Скрябин



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28. *Plagioporus interruptus* ^{Mantel, 1954}
n.sp.
(Figs. 36-37)

HOST: *Pseudolabrus coccineus* (Forster), soldier fish; intestine.

LOCALITIES: Wellington; Portobello.

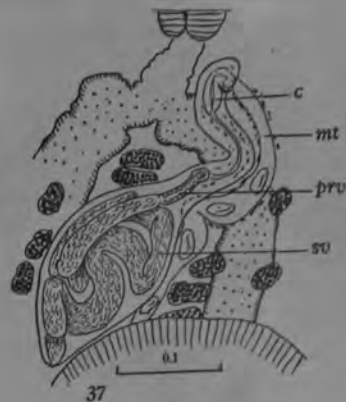
HOLOTYPE: U.S. Nat. Mus. Helminth. Collection No. 49132.

DESCRIPTION (based on five specimens): Two specimens were collected from a *Pseudolabrus* species, probably *coccineus*, at Portobello and three specimens from *P. coccineus* at Wellington. The latter specimens were smaller in size (not over 1.347 mm.) and somewhat macerated; but body proportions and egg size were similar to the two larger specimens from Portobello, the smallest of which was 1.794 mm. Length 1.116 to 1.925 mm.; greatest width at acetabular level, 0.207 to 0.455 mm. Anterior end broadly rounded; forebody 0.377 to 0.662 mm., usually about $\frac{1}{3}$ total body length but up to over 39%. Hindbody tapering to the almost pointed posterior end. Oral sucker 0.121 to 0.231 mm. in transverse diameter; acetabulum 0.181 to 0.385 mm., slightly wider than long, with transverse aperture. Sucker ratio 1 : 1.5 to 1.66. Prepharynx very short or lacking; pharynx in the 1.925 mm. specimen 0.076 mm. long by 0.057 mm. wide. Oesophagus short; bifurcation nearer to oral sucker than to acetabulum; caeca extending well past testes but not to posterior end of body.

Genital pore slightly to the left at level of oesophagus or posterior end of pharynx. Testes smooth, tandem, large, close together, in middle of hindbody. Posttesticular space 0.200 to 0.462 mm. Cirrus sac (Fig. 37) large, with two curves in its anterior half, extending obliquely to the right slightly past the anterior level of acetabulum but not overlapping the acetabulum itself (Fig. 37). It contains a long tubular, coiled, seminal vesicle in its basal half, followed by a tubular prostatic vesicle then a long pars prostatica with few prostatic cells, and a short, thick-walled cirrus.

Ovary ovoid, slightly to the right, immediately anterior to testes. To the left of the ovary is a ventral compact Mehlis' gland and a dorsal seminal receptacle. Uterus preovarian. Metraterm thin-walled with a few gland cells, about $\frac{1}{2}$ length of cirrus sac. Eggs 19 to 34 by 11 to 14 μ , usually 20 to 25 by 12 to 14 μ . Vitelline follicles numerous in forebody from middle of oral sucker to a little past anterior edge of acetabulum; contiguous dorsally; interrupted opposite acetabulum; lateral from acetabulum to anterior testis; interrupted opposite testes; usually filling most of the posttesticular space.

DISCUSSION: This species is unique in the genus in that the vitelline follicles are interrupted both opposite the acetabulum and the testes. It has much smaller eggs than most species, exceptions being *P. choerodonis* (Yamaguti, 1934) Yamaguti, 1938; *P. calotomi* (Yamaguti, 1934) Yamaguti, 1938; and *P. pacificus* Yamaguti, 1938. It is probably most similar to *P. choerodonis* (from *Choerodon azurio* in Japan) which has the vitellaria interrupted opposite the acetabulum but not opposite the testes. Also, *P. choerodonis* differs in having a wide, slightly lobed ovary, and a very short posttesticular space. *P. calotomi* has continuous vitellaria and the uterus overlaps the anterior testis. In *P. pacificus*, the vitellaria are not interrupted opposite the testes, do not extend so far anteriorly, and the seminal vesicle is less coiled. *P. isaitschikowi* (Layman, 1930) Price, 1934 has vitellaria interrupted opposite the acetabulum but its eggs are much larger.



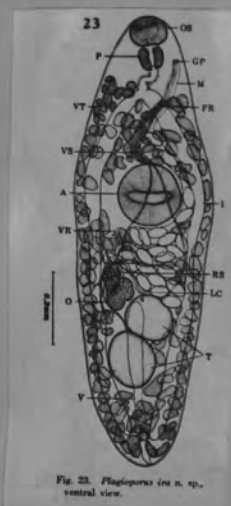
1940

Plagioporus ira Yamaguti, ~~1951~~

Length 1.85 to 2.05
Width 0.5 to 0.55. Cuticle smooth.
Oral sucker 0.16 wide
Acetabulum 0.25 to 0.275 wide, at anterior part of middle third.
Prepharynx very short, esophagus 0.1 to 0.12 long; ceca end near posterior end.
Testes rounded, one obliquely behind the other.
Cirrus sac slender reaching to anterior edge of acetabulum.
Seminal vesicle very much elongated with its distal part twisted.
Genital pore on left of pharynx.
Ovary coarsely indented, immediately anterodextral to anterior testis. Sem.rec. elongate saccular, partly dorsal to ovary.
Uterus between anterior testis and acetabulum.
Metraterm alongside cirrus sac.
Eggs not very numerous, 75 to 82 by 42 to 47, in life.
Vitellaria large beginning at level of esophagus and ending at posterior end of body.
Excretory vesicle to near anterior end of anterior testis.
Host: Choerodon azurio (Jordan and Snyder.)
Japan; Mie Prefecture

Compared with P. sillagonis Yamaguti, 1938 which it resembles in its large eggs.

Two specimens from Halichoeres poecilopterus were "probably" this species.



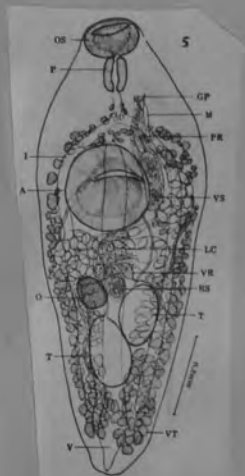
Plagioporus

Subgenus Paraplagioporus Yamaguti, 1939

Plagioporus. Body moderately small. Excretory vesicle long, reaching to anterior end of acetabulum, giving off a pair of collecting vessels at preovarian level. Parasitic in marine fishes. Type species: P. (Paraplagioporus) isagi.

Plagioporus (Paraplagioporus) isagi Yamaguti, 1939

1.5 to 2.1 by 0.55 to 0.65. Cuticula unarmed, thick. Oral sucker 0.13 to 0.21 wide; acetabulum 0.23 to 0.35 wide. Esophagus 0.07 to 0.2 long, bifurcating at second sixth of body; ceca simple. Testes ovoid to elliptical, obliquely tandem, at middle of hind body or slightly more posterior. Cirrus sac elongate either not reaching posterior end of acetabulum or extending back of it. Seminal vesicle constricted into two (rarely three) portions. Genital pore a little to left of midline at level of esophagus. Ovary subglobular, opposite anterior testis. Seminal receptacle retort-shaped. Uterus between ovary and acetabulum. Metraterm muscular alongside cirrus sac. Vitellaria extending along intestine from posterior part of esophagus to posterior end, at first dorsal, then lateral and then overreaching ceca both dorsally and ventrally. Eggs 57 to 60 by 36 to 39 μ . Excretory vesicle reaching to anterior end of acetabulum. Flame cell formula: $(2+2+2+2) \times 2 = 16$
Host: Parapristipoma trilineatum
Japan; Inland Sea



(Sayman, 1930)
Allocreadiidae
Price, 1934
Plagioporus isaitschikowi Yamaguti, 1938

Length: 0.8-2.2 mm.

Width: 0.3-0.63 mm. at acetabular zone

Oral sucker: Subterminal, spherical, 0.09-0.17 mm. in diameter

Acetabulum: (size:) 0.2-0.33 X 0.25-0.37 mm.
(position): At junction of anterior with middle third of body.

Sucker ratio: more than 1.2

Esophagus: Bifurcates in front of acetab. into simple ceca reaching Pharynx: Muscular, 0.06-0.1 mm. a little beyond posterior testis. in diameter.

Genital pore (location): Opens in left median line at level of pharynx.

Testes, shape: Rounded, 0.075-0.26 X 0.12-0.25 mm. Broader than long when body contracted but longer than broad when extended.
location: Median, tandem, at middle of posterior half of body.

Cirrus sac (extent): To anterior border of acetabulum.

Ovary, shape: Rounded or slightly indented, 0.07-0.138 X 0.066-0.138 mm.

location: To right of median line in front of anterior testis.

Vitellaria: Follicles beginning at level of posterior end of pharynx, interrupted on either side of acetabulum, but confluent dorsally in front of acetabulum and behind posterior testis.

Eggs: Ellipsoidal, thin-shelled, 57-63 μ long by 38-40 μ broad.

Other features:

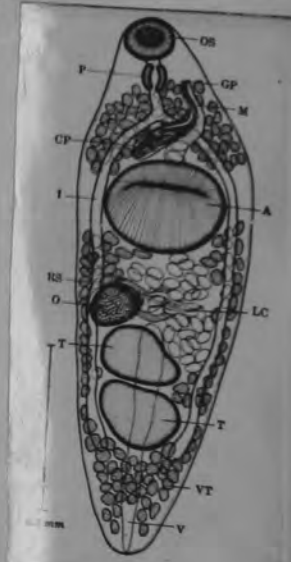
Host: Sebastiscus albofasciatus

Locality: Suruga Bay, Japan.

Reference: Studies on the Helminth Fauna of Japan. Part 21. Trematodes of Fishes, IV. Kyoto, Japan.

Comparisons: None.

Life cycle:



Plagioporus (Plagioporus) isaitschikowi
(Layman, 1930) Price, 1934

SYNONYM: *Lebouria isaitschikowi* Layman, 1930.

HOST: *Lethrinus microdon* (Lethrinidae).

HABITAT: Small intestine.

LOCALITY: Jesselton, North Borneo.

DATE: 29 August 1960.

SPECIMENS: U.S.N.M. Helm Coll. No. 1007 (two slides).

MEASUREMENTS AND SOME PERTINENT DATA (based on one specimen in ventral and one in lateral view): Body 1,466 to 1,767 long, 569 wide (in one); forebody 552 to 579, hindbody 668 to 897, preoral body 5 to 8, posttesticular space 199 to 307; oral sucker 128 to 144 long, 158 wide, 131 deep; acetabulum 246 to 291 long, 318 wide, 262 deep, at level of anterior 41 to 46 percent of body length; sucker length ratio 1:1.92 to 2.02; prepharynx 27 to 32 long; pharynx 75 to 77 long, 98 wide, 98 deep; esophagus 111 to 118 long; cecal bifurcation 166 to 194 preacetabular; testes overlapping slightly; anterior testis 188 to 214 long, 232 wide, 166 deep; posterior testis 239 to 243 long, 195 wide, 191 deep; acetabulum to anterior testis 92 to 177, to posterior testis 213 to 350; cirrus sac 389 to 391 in longitudinal extent, 49 wide, 44 deep, overlapping anterior portion of acetabulum 19 to 21; genital pore 368 to 372 preacetabular, ovary 122 to 134 long, 118 wide, 81 deep; zero to 92 postacetabular; seminal receptacle in series 90 long, 79 wide; vitellaria commencing in series postpharyngeal, interrupted opposite acetabulum on both sides; 12 eggs measuring 63 to 70 by 33 to 37.

Discussion: Our specimens readily keyed to *P. isaitschikowi* in the keys to the species of *Plagioporus* given by Manter (1954) and Skriabin and Koval (1958). This parasite has been reported from *Sebastes schlegelii* from Peter the Great Bay by Layman (1930), *Sebastes albotasciatus* from Japan by Yamaguti (1938), and *Paralabrax elatus* from California by Manter and Van Cleave (1951). Several authors, including Skriabin and Koval (1958), list Yamaguti (1938) as having transferred this species from *Lebouria* Nicoll (1906) to *Plagioporus*; initially this was done by Price (1934).

FROM FISCHTHAL AND KUNTZ (1965)

Plagioporus

Lebouria isaitschikowi Layman 1930

1.36 mm. long, 0.4 mm. wide.

Oral sucker p.114 mm. long, 0.147 mm. wide

Ventral sucker 0.213 mm. long, 0.262 mm. wide.

Genital pore a certain distance in front of the ventral sucker, almost median, only slightly to the left.

Cirrus sac reaches the anterior end of the ventral sucker and extends dorsally over it.

Oval-eress Ovary cross-oval, 0.088 mm. long, 0.138 mm. wide.

Testes tandem, cross-oval. Length of posterior testis:

0.175 mm, width 0.147 mm. Length of anterior testis:

0.180 mm.

Uterus weakly developed. Eggs large 65 by 32 μ .

Pharynx 0.081 mm. long. Ceca not seen.

Host: Sebastodes schlegelii (Hilgendorf), intestine

Frequency: One specimen, 17 fishes examined

Reported from: Sebastodes albofasciatus by Yamaguti, 1938



~~Is this albocreadium?~~

see next page - Yamaguti, 1938

1.8 -
3,47) 262
147
1150
1176

Plagioporus japonicus Yamaguti, 1938

Length: 1.8-1.93 mm.

Width: 0.51-0.7 mm at level of ovary or anterior testis

Oral sucker: 0.135-0.15 mm in diameter.

Acetabulum: (size:) 0.25-0.32 mm in diameter.
(position): At anterior part of middle third of body.

Sucker ratio: Acetabulum much larger.

Esophagus: 0.12 mm long in the type 1.93 mm long.

Pharynx: 78 X 90-96 μ

Genital pore (location): Sinistral to pharynx or anterior end of esophagus.

Testes, shape: Subglobular, broader than long, with their long axes transverse or oblique

location: At about middle of posterior two-thirds of body.

Cirrus sac (extent): To anterior end of acetabulum.

Ovary, shape: Subglobular, entire or slightly indented, with oblique axis.

location: Immediately anterodextral to anterior testis.

Vitellaria: Extending from pharynx to posterior extremity, confluent in forebody and behind posterior testis.

Eggs: Not very numerous, oval, 57-90 X 33-45 μ , usually 60-69 X 33-39 μ in life.

Other features:

Host: Neopercis sexfasciata (Temm. et Schleg.) (type host), N. multifasciata (Doderlein), N. aurantiaca (Doderlein) and N. muronis

Locality: Sea of Japan

Tanaka.

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

Comparisons: P. calotomi Yamaguti, 1934

Life cycle:

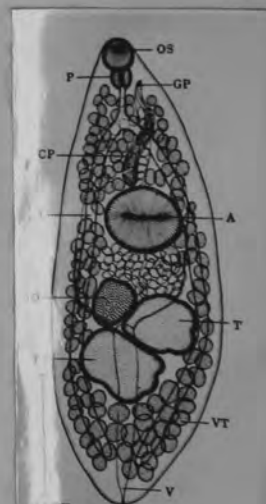


Fig. 5. Plagioporus japonicus: ventral view.

STENAKRON KERGUELENSE ~~sp. nov.~~ Prudhoe and Bray, 1973

(Figs. 15, 16)

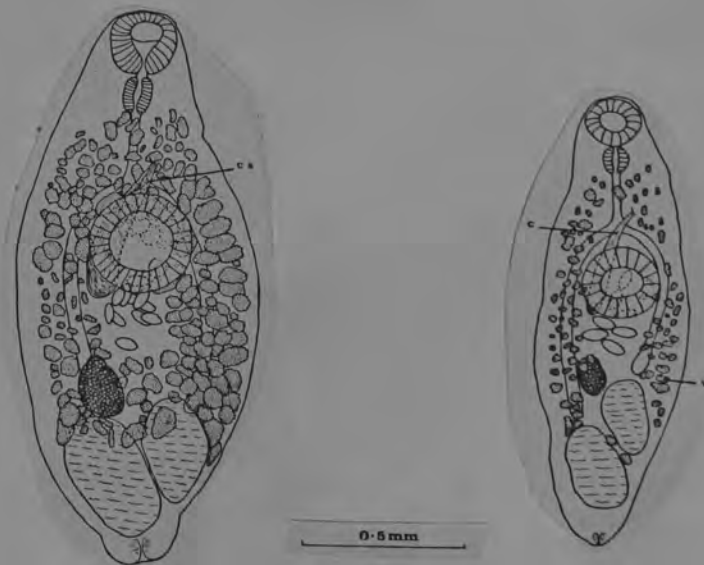
Hosts and localities: *Notothenia coriiceps* — Heard I., 28.xi.1929; *Notothenia cyanobranca* — from various stations at Kerguelen, between 16 Nov. 1929 and 15 Feb. 1930; *Champscephalus gunnari* — Stn. 64; *Zanclorhynchus spinifer* — Stn. 83.

The following description is based on a number of badly-fixed specimens. The body is pyriform or somewhat fusiform, measuring 0.45–1.83 mm in length and 0.2–0.76 mm in maximum width, which occurs at about the middle of the body. The cuticle is without scales or spines. The subterminal oral sucker is more or less rounded and measures from 0.07–0.21 mm in diameter. The ventral sucker, situated just anteriorly to the central region of the body, is also normally rounded and varies between 0.12 mm and 0.31 mm in diameter. In some specimens the ventral sucker is slightly different in appearance, for it is longer than wide, measuring 0.12–0.18 mm long and 0.08–0.14 mm wide. In general, the sucker ratio (oral:ventral) is 1:1 to 1:1.6. Owing to contraction of the body, the prepharynx is not usually apparent in most specimens, but when it is observed it reaches to no greater length than 24 μ m. It opens into a globular or slightly elongate pharynx measuring 0.04–0.1 mm wide and 0.04–0.11 mm long. The oesophagus, which has a cuticular lining, varies in length between 0.04 mm and 0.26 mm. The intestinal bifurcation occurs just anteriorly to the ventral sucker. The intestinal caeca are narrow and lined with a glandular epithelium. They extend posteriorly to a position either just anteriorly to the testes or slightly overlapping them. In some specimens the ends of the caeca are slightly bulbous.

The excretory pore is situated on the posterior margin of the body and has a small area of glandular cells surrounding it, but this feature is not clearly seen in all specimens. The excretory vesicle is usually a simple tube, but occasionally it may be considerably dilated behind the testes. In serial sections of one specimen the tubular vesicle has been traced forward to a position anterior to the ovary.

The genital pore occurs in the region of the intestinal bifurcation and in less contracted specimens it usually lies a little anteriorly to the bifurcation and to the left of the median line. The cirrus-sac is elongate claviform, reaching posteriorly to the hinder margin of the ventral sucker or a little beyond. It measures 0.21–0.4 mm in length and 0.05–0.11 mm in maximum width. The smooth cirrus and the pars prostatica are well developed and of similar length. The convoluted seminal vesicle fills much of the cirrus-sac. The two testes are arranged symmetrically or slightly diagonally side by side, or obliquely one behind the other, usually contiguous. They are oval in outline and measure 0.11–0.44 mm long and 0.07–0.28 mm wide, one often being a little larger than the other.

The ovary is generally situated to the right of the median line, immediately in front of the testis on that side. It may be entire, trilobate or even quadrilobate and measures 0.06–0.2 mm long and 0.065–0.15 mm wide. A prominent "shell"-gland is situated either dorsally or anteriorly to the ovary or nearer to the median line than the ovary. It may be as large as, or even larger than the ovary, but is often obscured by eggs. Laurer's canal opens dorsally to one side



of the median line in the region of the "shell"-gland. There is no receptaculum seminis, but an accumulation of sperm is sometimes seen in the proximal region of the uterus, which presumably represents a receptaculum seminis uterinum. Numerous vitelline follicles of irregular shape and size extend from the pharyngeal region to about the middle level of the testes. Only in grossly contracted specimens do the vitellaria reach the level of the posterior margins of the testes. They are disposed laterally and overlap the intestinal caeca dorsally and ventrally, and the dorsal parenchyma they may be confluent in the median line in the region of the intestinal bifurcation and just anteriorly to the testes. In the region of the ovary, the vitelline ducts from either side converge to open into a distinct vitelline reservoir situated in the median line, ventrally to the union of the ducts. The uterus extends anteriorly from the ovary and opens into a well-developed metraterm, which is rather shorter than the cirrus-sac. The eggs are relatively few and in an uncollapsed condition measure $82-92\mu\text{m} \times 45-50\mu\text{m}$. They are operculated and have a small boss at the anopercular pole.

This new form may be readily distinguished from all known species of the genus *Stenakron* by the position of the genital pore, by the distribution of the vitelline follicles in the dorsal parenchyma of the body and by the size of the eggs.

The study of this material has revealed a very close resemblance between the genera *Stenakron* Stafford, 1904, (type-species: *S. vetustum* Stafford *nom. nov. pro Distomum* sp. Linton, 1901) and *Eurycreadium* (type-species: *E. vitellosum* Manter, 1934). At first sight the main difference between them appears to be that in *Stenakron* the testes are disposed one behind the other directly or somewhat obliquely, while in *Eurycreadium* they are more or less symmetrically arranged.

In specimens mentioned by Stafford (1904) and described by Miller (1941) as *Stenakron vetustum* from the intestine of the sea-raven (*Hemitripteris americanus*) in eastern Canadian waters the disposition of the testes is similar to that found in Linton's (1901) specimens from *Limanda ferruginea*. Ronald (1960) has given some redescription of *S. vetustum* from *Limanda ferruginea* in the Gulf of St. Lawrence, but he did not mention the testes, so one might assume that their arrangement is no different from that described by Linton. On the other hand, Ching (1961) has described specimens as *Eurycreadium vitellosum* Manter, 1934, from *Microstomus pacificus* in Friday Harbour, Washington State, and in these specimens the testes are said to be arranged "slightly oblique to tandem" and are presumably disposed differently from the type-specimens of this species found in deep-water fish at Tortugas, Florida. Further, in specimens described by Strelkov (1960) as *S. vetustum* from several species of fishes in Avachin Bay, East Kamchatka, the testes are arranged symmetrically, as well as more or less in tandem, suggesting that here the relationship of the testes to one another has no generic significance. It appears from Strelkov's figures, however, that his specimens were distorted by compression at fixation, thus rendering the specimens useless for comparative purposes. Nevertheless, Mamaev, Parukhin and Baeva (1963) have also described *S. vetustum* from pleuronectid fishes in Far Eastern Seas and their specimens show a similar variation in the arrangement of the testes. Moreover, such variations have been found in the present material of *Stenakron kerguelense*. It appears, therefore, that the arrangement of the testes provides no means for differentiating the two genera. One diagnostic feature, recognized by Yamaguti (1971), upon which *Stenakron* may be distinguished from *Eurycreadium* is in the posterior limit of the vitelline follicles. In the type-species of the latter genus the follicles reach posteriorly beyond the testes, but in the former genus they do not.

Another element of confusion regarding these two genera is that initially they were regarded as members of the family Allocreadiidae (*sensu lato*), but Mamaev, Parukhin and Baeva (1963) placed *Stenakron* in the family Fellodistomidae, and this appears to have been accepted by subsequent authors without comment. In his recent (1971) synopsis of the families and genera of digenetic trematodes, Yamaguti has also placed *Eurycreadium* in the Fellodistomidae. There seems to be some doubt as to the soundness of this conclusion, because the two genera differ from the fellodistomes in two morphological features of importance in family diagnosis. The fellodistomes have a Y- or V-shaped excretory vesicle and the uterine coils extend posteriorly beyond the testes to the hinder end of the body. These features are not present in *Stenakron* nor in *Eurycreadium*, for in both genera the excretory vesicle is a simple tube and the uterine coils are confined to the region between the testes and the ventral sucker. In fact, in these features, as well as in others, the two genera are very closely related to members of the Opecoelidae, to which family *Stenakron* and *Eurycreadium* are here referred. This is substantiated by the fact that the morphological relationship between *Stenakron* and most species of the subgenus *Plagioporus* (*Caudotestis*)—a generally accepted member of the Opecoelidae—is so close that only the difference in the posterior limit of the intestinal caeca appears to separate them morphologically.

Prudhoe and Bray, 1973

9. *Plagioporus (Plagioporus) kyusen* n. sp.

(Pl. XX, Fig. 7) Yamaguti, 1959

Habitat: Small intestine of *Halichoeres poecilopterus* TEMM. et SCHLEG.

Material: Six, mostly macerated, gravid specimens fixed in Schaudinn's solution and stained with Heidenhain's hematoxylin.

Locality and date: Aquarium of Tokyo University at Shinmaiko on Ise Bay.

Body approximately fusiform, more tapered anteriorly than posteriorly, 0.65-0.9 mm in length, with maximum breadth of 0.22-0.3 mm behind middle. Cuticle thin and smooth. Oral sucker subterminal, 24-32 μ in diameter, followed by distinct prepharynx 14-17 \times 14-19 μ , esophagus 26-52 μ long; ceca terminating near posterior extremity. Acetabulum 0.12-0.18 mm in diameter, nearly equatorial.

Testes subglobular, 56-104 \times 56-130 μ , obliquely tandem in posterior third of body, the anterior on the left, the posterior a little to the right. Cirrus pouch subcylindrical 0.2-0.34 mm long, 46 μ wide at posterior swelling, extending from dorsal side of anterior part of acetabulum to genital pore, containing winding tubular seminal vesicle, poorly differentiated pars prostatica, prostate cells and straight ejaculatory duct. Genital pore sinistral to intestinal bifurcation.

Ovary transversely elongated oval, 31-44 \times 44-56 μ , situated on the right just in front of posterior testis. Seminal receptacle spherical, 36 \times 44 μ in the type, immediately anterodorsal to ovary. The germiduct arising from the right end of the ovary joins the seminal receptacle at its posterior end, whence it turns forward across the seminal receptacle and then receives the duct from the vitelline reservoir. Laurer's canal is unable to trace to its dorsal opening.

Uterus distended with large eggs in the area bounded by anterior testis, shell gland, acetabulum and left cecum; metraterm well differentiated; eggs oval, very large as compared with body size, measuring 59-67 \times 36-40 μ . Vitelline follicles co-extensive with ceca, commencing at level of genital pore, not confluent in posttesticular area. Vitelline reservoir triangular, anterosinistral to ovary. Excretory vesicle tubular, reaching to level of ovary; pore terminal.

This species is characterized by small body size and comparatively large egg size. The specific name is the Japanese name for the host.



Flagioporus lobata (Yamaguti) (1934) ^{MS} Allocreadiidae
Allocreadiinae ^{Mantel, 1967}

Syn: *Lebouria lobata* Yamaguti, 1934

Size 1.14 by 0.6 mm. Oral sucker 0.11 by 0.15 mm. Short prepharynx. Pharynx 0.063 by 0.074 mm. Esophagus 0.053 mm. long. Ceca divergent, extending to near the posterior end.

Acetabulum 0.21 by 0.27 mm., 1/3 from anterior end.

Testes transversely elongated, irregularly lobed, tandem, in posterior part of body (posterior third). Anterior testis 0.15 by 0.33 mm. Cirrus pouch 0.18 by 0.053 mm. its posterior end at anterior border of acetabulum. Seminal vesicle convoluted. Genital pore to left of esophagus.

Ovary irregularly ovate, 0.17 mm. wide, between median line and right cecum. Uterus between acetabulum and anterior testis.

Eggs 63 by 39 μ . Vitellaria of large follicles beginning at level of posterior part of pharynx, confluent anterior to acetabulum and posterior to hind testis.

This species considered to differ from all others in the lobation of both testes and ovary.

Host: small intestine of *Chelidonichthys kumu* (Lesson & Carnot)

Locality: Toyama Bay, Japan

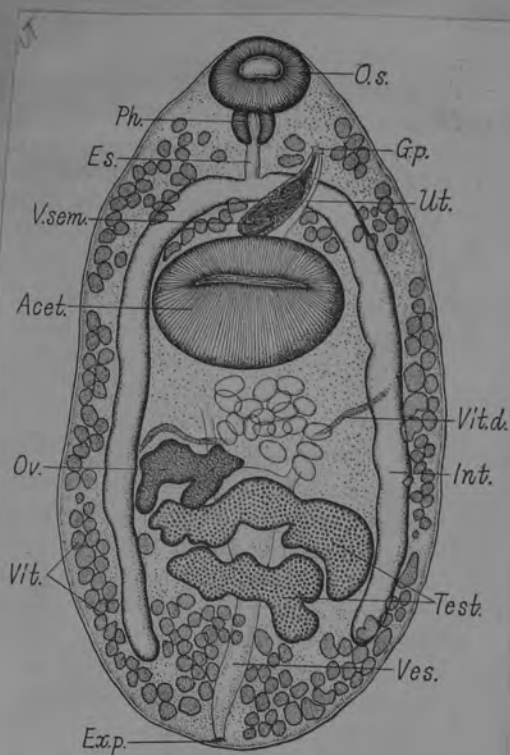


Fig. 16. *Lebouria lobata*; ventral view.
Type 1.14 x 0.6 mm.

Exam. rec.
not
measured

Plagioporus longicaudus sp. nov. (Fig. 1) Hafeezullah, 1971

HOST. *Cynoglossus lida* (Bleeker); tongue sole; Cynoglossidae.

SITE. Intestine.

NUMBER OF SPECIMENS. 2.

LOCALITY. Tuticorin, Gulf of Manaar.

DESCRIPTION (with measurements based on two specimens). Body 2.611–3.563 mm long, 0.612–0.8 mm wide, elongate, subcylindrical, slightly expanded at acetabular level. Cuticle unarmed. Acetabulum 266–330 in diameter, spherical, at 753–1069 from anterior end of body. Oral sucker 173–237 in diameter, subterminal, smaller than acetabulum. Width ratio of suckers 1:1.3–1.5. Prepharynx indistinct, probably lacking; pharynx 116–140 × 140–161, globular; oesophagus about 205 long; caecal bifurcation nearer to oral sucker than to acetabulum; caecae not quite reaching posterior end of body.

Testes 249–365 × 164–247, oval or globular, entire or slightly irregular, tandem,

immediately postequatorial. Cirrus sac claviform, not reaching acetabulum posteriorly, enclosing coiled seminal vesicle, *pars prostatica* with gland cells and cirrus. Genital pore sinistral at about mid-oesophageal level.

Ovary 87–131 in diameter, globular, immediately pretesticular, slightly right of median line. Seminal receptacle dorsal to and much larger than ovary, right of median line. Shell gland antero-sinistral to ovary and seminal receptacle. Vitelline follicles extending from caecal bifurcation to posterior end, may be continuous or discontinuous at acetabular level, confluent in post-testicular space. Uterus between ovary and genital pore; metraterm differentiated. Eggs 74–82 × 38–47. Excretory vesicle I-shaped, extent undetermined. Excretory pore terminal.

The shape of body, the appreciably longer post-testicular space, and the extent and distribution of vitelline follicles, distinguishes *Plagioporus longicaudus* from all the known species of the genus *Plagioporus*. The species can also be separated from the known species by one or more of the following characters: position of the genital pore; posterior extent of the cirrus sac; position and arrangement of the gonads; size of the eggs.



Fig. 1. *Plagioporus longicaudus*, ventral view of holotype.

105. *Plagioporus (Plagioporus) longisacculus* ~~sp. n.~~ Yamaguti, 1970
(Fig. 69)

HABITAT: Intestine of *Pristipomoides microlepis* (local name "opakapaka"); Hawaii.

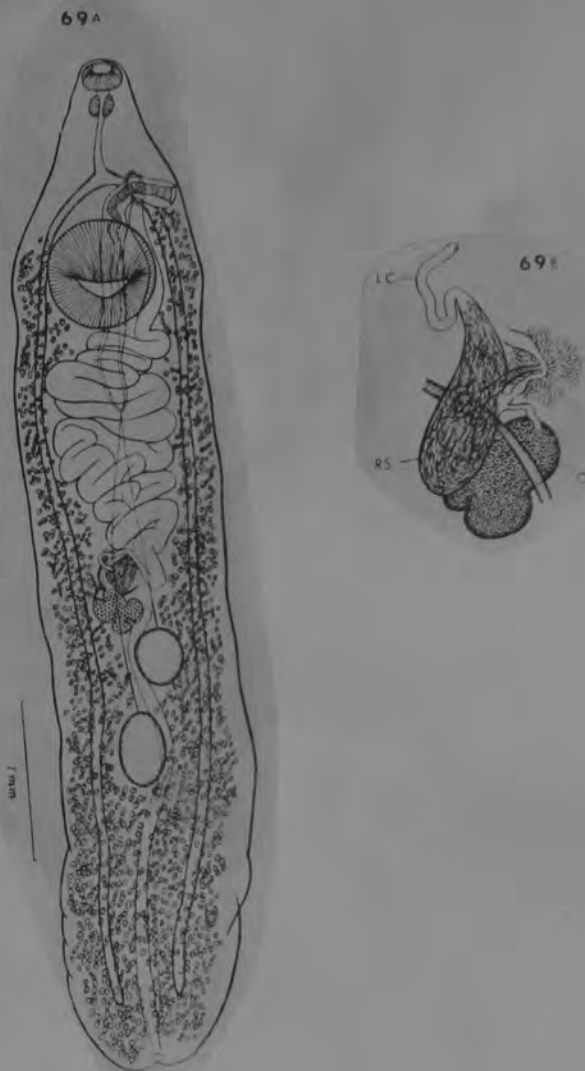
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63583.

DESCRIPTION (based on four whole mounts): Body flattened subcylindrical, though the forebody is distinctly tapered anteriorly, 5.5-6.3 X 1.2 mm. Cuticle smooth. Oral sucker ventroterminal, 0.19-0.29 X 0.27-0.38 mm, followed by distinct prepharynx. Pharynx spherical, 0.13-0.15 X 0.15-0.21 mm; esophagus 0.35-0.4 mm long, bifurcating anterior to middle of anterior third of body. Cecae terminating blindly near posterior extremity. Acetabulum 0.56-0.65 mm in diameter, with its center usually posterior to middle of anterior third of body.

Testes subglobular to oval, obliquely tandem, 0.33-0.6 X 0.29-0.4 mm, posterior to middle of hindbody. Cirrus pouch very long, cylindrical, 1.0-1.8 X 0.12-0.16 mm, extending a short distance into postacetabular uterine field, containing a tubular seminal vesicle 40-80 μ wide and a long, winding, muscular ejaculatory duct which is everted out of the genital pore as a smooth stout cirrus 0.3 mm long by 0.17 mm wide in the type. Prostatic complex poorly differentiated. Genital pore a little to left of intestinal bifurcation.

Ovary three- or four-lobed, 0.28-0.36 X 0.31-0.35 mm, postequatorial, separated dorsally from anterior testis by anterior end of excretory vesicle. Seminal receptacle saccular, 0.1-0.18 mm in diameter, dorsal and anterior to ovary. Germiduct arising from middle or left lobe of ovary, joining seminal receptacle at its side, then turning forward to unite with vitelline reservoir. Laurer's canal arising from attenuated anterior end of seminal receptacle, forming a sigmoid curve near its origin, opening in median line dorsal to uterus a little anterior to ovary, but a considerable distance posterior to acetabulum. Uterine coils occupying entire intercecal field between ovary and acetabulum; metraterm running between left cecum and cirrus pouch; mature eggs measured 60-68 X 38-45 μ in life; most of uterine eggs including immature forms measured 60-70 X 39-49 μ in whole mounts. Vitelline follicles circumcecal, commencing at level of genital pore, confluent in posttesticular field. Excretory vesicle tubular, sigmoid anteriorly and reaching to ovary, opening at median terminal notch.

DISCUSSION: This species differs from any of the known members of the genus *Plagioporus* in the posterior extent of the cirrus pouch. It bears a certain resemblance to *P. (P.) longivesicula* Yamaguti, 1952 from *Lethrinus* sp. of Macassar, but differs distinctly from the latter not only in the length of the cirrus pouch but also in the length of the excretory vesicle. The specific name refers to the very long cirrus pouch.



new genus?

Plagioporus (Plagioporus) longisaccus n. sp. (Figs. 3 and 4) FISCHTHAL AND KUNTZ, 1964

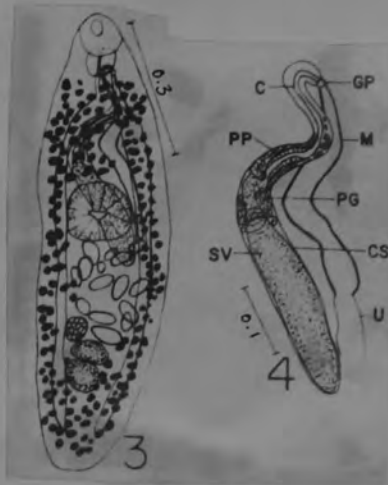
HOST: *Choerodon anchorago* (Labridae).
HABITAT: Small intestine.
LOCALITY: Puerto Princesa, Palawan Island, Philippines.
DATE: 21 May 1962.
TYPE: USNM Hebm. Coll. No. 37893.

DESCRIPTION (based on one specimen): Body 990 by 285, elongate, widest at acetabulum, tapering toward both extremities, unarmed; forebody 370, hindbody 482, posttesticular space 162. Oral sucker 87 by 79. Acetabulum 138 by 145, just anterior to midbody. Sucker length ratio 1:1.59. Prepharynx short, 19; pharynx round, diameter 55; esophagus 48, longer than prepharynx; cecal bifurcation 191 preacetabular; ceca ending blindly, extending nearly to midlevel of posttesticular space, 85 from posterior extremity. Excretory bladder tubular, extending anteriorly to anterior margin of anterior testis; pore terminal.

Testes two, tandem, in contact, intercecal, transversely elongate; anterior testis 65 by 97, posterior testis 77 by 85; acetabulum to anterior testis 189, to posterior testis 240. Cirrus sac sinuous, very long, extending anteriorly over acetabulum dorsum from 54 postacetabular to posterior region of pharynx, looping to left at genital pore, longitudinal extent 445 by 65 wide, relatively thin walled, containing seminal vesicle, pars prostatica, prostate gland cells, and cirrus. Seminal vesicle long, 305 by 63, commencing postacetabular and terminating preacetabular, with two short loops at distal portion. Pars prostatica thick walled, short, 75 by 17, surrounded by prostate gland cells. Cirrus long, muscular, sinuous within cirrus sac, looping posteriorly to left short distance to genital pore. Latter sinistral to posterior portion of pharynx, 247 preacetabular.

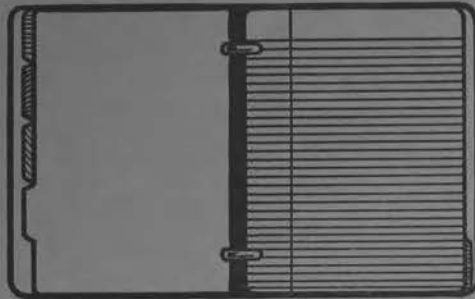
Ovary 75 by 61, 133 postacetabular, submedian to right, slightly overlapping right cecum dorsally, in contact with anterodextral portion of anterior testis. Seminal receptacle transversely elongate, 48 by 26, preovarian, overlapping anterior edge of latter dorsally. Vitelline follicles large, from just postpharyngeal to posterior extremity, confluent dorsally in forebody, filling posttesticular space; vitelline reservoir median. Ootype complex anteromedial to ovary. Uterine coils between anterior testis and acetabulum; metraterm thick walled, long, 295 by 36, commencing sinistral to midacetabular level, sinistral to cirrus sac and following course of latter to genital pore. Eggs large, yellow-brown, 10 measuring 63 to 66 by 31 to 35.

DISCUSSION: This trematode fits readily into the subgenus *Plagioporus* Stafford, 1904. *P. longisaccus* differs from all members of the genus, with two exceptions, in having the cirrus sac extending postacetabular. The exceptions are *P. synagris* described by Yamaguti (1952) from *Synagris* sp. from Japan, and *P. longicirratu*s from a triggerfish (Balistidae) from Fiji by Manter (1963). However, both these forms belong in the subgenus *Caudatestis* Isatschikow, 1928, the latter differing from *Plagioporus* chiefly in not having the ceca extend posttesticular. The species name *longisaccus* (*L. longus*, long; *L. saccus*, sac) refers to the long cirrus sac.



PLAGIOPORUS

LOOSE LEAF INDEX



DURABLE INDEX
DIVIDERS, SUITABLE
FOR SCHOOL OR
COMMERCIAL USE.

IDEAL FOR CLASS-
IFYING, OR SEPARAT-
ING STUDIES, VARIOUS
SUBJECTS OR MISC-
ELLANEOUS DATA.

Name _____ Telephone _____

Address _____

School _____ Class _____

Course _____ Year _____

SUBJECTS

CLASS SCHEDULE

PERIOD	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	EIGHTH
SUNDAY	COURSE							
	INSTRUCTOR							
MONSDAY	COURSE							
	INSTRUCTOR							
TUESDAY	COURSE							
	INSTRUCTOR							
WEDNESDAY	COURSE							
	INSTRUCTOR							
THURSDAY	COURSE							
	INSTRUCTOR							
FRIDAY	COURSE							
	INSTRUCTOR							
SATURDAY	COURSE							
	INSTRUCTOR							