1990

Binder 081, Gorgoderidae Ph-Z [Trematoda Taxon Notebooks]

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Probolitrema Looss, 1902 [1])

Generic diagnosis. — Gorgoderidae, Probolitrematinae: Body oval to lanceolate, flat or somewhat concave ventrally and convex dorsally; anterior extremity somewhat pointed; posterior extremity rounded. Oral sucker comparatively small, followed by muscular pharynx. Esophagus short, ceca simple, terminating at posterior extremity. Acetabulum about one third of body length from anterior extremity. Testes divided into a small number of grape-like bunches of acini which are arranged one closely behind another in posterior extracecal fields. Genital pore postbifurcal. Ovary compact, submedian, postacetabular. Large receptaculum seminis present. Vitellaria extracecal, pretesticular, consisting of tubular acini. Uterus intercecal. Excretory vesicle Y-shaped, opening at emarginate posterior extremity. Parasitic in body cavity of sharks and rays.

Genotype: *P. richiardii* (Lopéz, 1888) Looss, 1902 (Pl. 7, Fig. 76), in *Acanthias vulgaris;* Atlantic and Mediterranean.

Other species:

P. antarcticum Woolcock, 1935, in *Mustelus antarcticus;* Victoria.

P. californiense Stunkard, 1935, in *Myliobatus californicus, Rhinobatis productus, Platyrhinoides triseriatus;* California. Anatomy — Markell (1953).

P. capense Looss, 1902, for *Anaporrhutum richiardii* of Ofenheim (1900) nec López, in *Scyllium* sp.; Atlantic.

P. clelandi Johnston, 1934, in *Mustelus antarcticus;* Encounter Bay, Australia. Also in *Acanthias* sp.; New Zealand.

P. mexicanum Markell, 1956, in *Mustellus lunulatus, Urobatus maculatus, Dasybatis brevis;* Mexico.

P. philippi Woolcock, 1935, in *Heterodontus philippi;* Australia. An immature specimen found in body cavity of *Squalus kirki;* New Zealand — Manter (1954).

P. rotundatum Johnston, 1934, in *Trigonorrhina fasciata;* Kangaroo Island, Australia.

P. simile Johnston, 1934, in *Mustelus antarcticus;* Encounter Bay; Australia.

[1]) Divided into two subgenera, *Probolitrema* (Looss, 1902) and *Reduzotrema* Pigulevsky, 1952, according to branching of vitellaria and extent of testes — Skrjabin (1952).

PROBOLITREMA Looss, 1901

Large Anaporrhutinae with definitely broadened posterior part. A strong muscular pharynx present; intestinal ceca not branched. Testes divided into a large number of irregularly shaped bodies and together with the vitelline glands are definitely external to the ceca. Large seminal receptacle present. In body cavity of Elasmobranch fishes.

Type species: P. richiardii (Lopez, 1888), Looss, 1902.

others: P. capense (~~Ofenheim~~ Looss, 1902 *
P. clelandi Johnston, 1934
P. antarcticus Woolcock, 1935
P. rotundatum Johnston, 1934
P. californiense Strunkard, 1935
P. simile Johnston, 1934
P. philippi Woolcock, 1935
P. mexicana Markell, 1956 J. Parasitol 758

* = The "A. richiardii" of Ofenheim, 1900

TABLE 1
Diagnostic characters of the species of *Probolitrema*

Species	*P. richiardii*	*P. capense*	*P. rotandatum*	*P. clelandi*	*P. antarcticum*	*P. philippi**	*P. californiense*
Described	Lopez, 1888	Looss, 1902	Johnston, 1934a	Johnston, 1934a	Woolcock, 1935	Woolcock, 1935	Stunkard, 1935
Testis number	35–36	28–38	25–34	31–37	24–30	24	16–26
Ratio, oral: vent. sucker	1 : 3	1 : 1	2 : 3	1 : 1	2 : 3	1 : 2	1 : 2
Ovary	crescentic to lobed	2–3 lobed	slightly trilobed	compact	3–5 lobed	crescentic; indistinctly trilobed	2–5 lobed
Vitellaria	loose; long digitiform branches	loose; moderately long slender branches	compact; few shrub-like branches with short lobes	compact; short rounded lobes	loose; long digitiform branches which may anastomosa	small "scattered follicles"	compact to moderately loose; branches long, digitiform, may anastomose
Eggs	?	50μ x ?	50–54μ x 36–39μ	42–74μ x 37–57μ	36–45μ x 35–40μ	48–50μ x 36–42μ	43–60μ x 40–45μ
Hosts	*Acanthias vulgaris* *Mustelus vulgaris* *Myliobatis aquila*	*Scyllium* sp.	*Trygonorrhina fasciata*	*Mustelus antarcticus*	*Mustelus antarcticus*	*Heterodontus philippi*	*Aetobatis californicus* *Platyrhinoides triseriatus* *Rhinobatis productus*
Locality	Mediterranean	South Africa	Australia	Australia	Australia	Australia	California

*Described from a single specimen.

Markell, 1953
Trans. Amer. Microsc. Soc.

Species P. mexicana

Described Marshall, 1956

Testis number 17-39

Ratio, oral:
vent, sucker 1:1.3

Ovary 3-5 lobes

Vitellaria compact or
quite loose
(tubular)

Eggs 50-60 x 34-40 u

Hosts Mustelus lunulatus
Urobatus maculatus
Dasyatis brevis

Locality Santa Inez Bay,
Baja California,
Mexico

Probilotrematinae Gorgoderidae

Les caractères principaux autres que ceux des cæca, qui ont en systématique une importance majeure pour la distinction des genres et espèces, sont ceux de l'emplacement et de la structure des vitellogènes et ceux de la structure des testicules. Je les rappelle dans le tableau ci-après.

GENRES ET ESPÈCES	CÆCA DIGESTIFS	TESTICULES	VITELLOGÈNES	OBSERVATIONS
— *Anaporrhutum* OFENHEIM, 1900				
albidum BRANDES *in* OFENHEIM, 1900	aucune sacculation	petits follicules	en grande partie intercæcaux	générotype
largum M. LUEHE, 1906	quelques sacculations	*id.*	complètement intercæcaux	*Staphylorchis* pour H. A. BAYLIS, 1927, p. 426
mantae H. F. NAGATY et M. R. AAL, 1961	aucune sacculation	*id.*	*id.*	*Petalodistomum* (*Staphylorchis*) pour PIGULEVSKY, 1952
				Nagmia pour YAMAGUTI, 1958
— *Staphylorchis* L. TRAVASSOS, 1920				sous-genre de *Petalodistomum* pour PIGULEVSKY *in* SKRJABIN, 1952, p. 723
cymatodes (S. J. JOHNSTON, 1913)	*id.*	*id.*	*id.*	générotype
				Petalodistomum pour S. J. JOHNSTON, 1914
gigas Mary SAMUEL, 1952	*id.*	*id.*	*id.*	
parisi Hilary CRUZ, 1957	*id.*	*id.*	*id.*	
sp. dub. Hilary CRUZ 1957	*id.*	*id.*	*id.*	
— *Nagmia* H. F. NAGATY, 1930				
yorkei NAGATY, 1930	sacculations très nombreuses avec diverticules	*id.*	*id.*	générotype est synonyme de *Petalodistomum* pour T. H. JOHNSTON, 1934 et Ed. CABALLERO, 1945.
floridensis Ed. K. MARKELL, 1953	*id.*	*id.*	*id.*	
nebrii H. F. NAGATY et T. M. R. AAL, 1961	sacculations bien prononcées	*id.*	*id.*	
stegostomatis H. F. NAGATY et T. M. R. AAL, 1961	*id.*	*id.*	*id.*	
rosettensis M. A. MELOUK, 1940	sacculations peu prononcées	moindre subdivision en lobules	*id.*	

GENRES ET ESPÈCES	CÆCA DIGESTIFS	DIGESTIFS	VITELLOGÈNES	OBSERVATIONS
— *Pernagmia* H. F. NAGATY et T. M. R. AAL, 1961				
nebrii H. F. NAGATY et T. R. M. AAL, 1961	sacculations bien prononcées	petits follicules	*id.*	générotype
concolori H. F. NAGATY et T. M. R. AAL, 1961	*id.*	*id.*	*id.*	
stegostomatis H. F. NAGATY et T. M. R. AAL, 1961	*id.*	*id.*	*id.*	
— *Petalodistomum* S. J. JOHNSTON, 1914				
polycladum S. J. JOHNSTON, 1914	*id.*	en plusieurs masses compactes lobées	*id.*	générotype
pacificum Ed. CABALLERO 1945	*id.*	gros follicules	*id.*	*Nagmia* pour Ed. K. MARKELL, 1953
— *Probolitrema* A. LOOSS, 1902				
richiardii (C. LOPEZ, 1888)	sacculations présentes ou absentes	nombreuses petites masses irrégulières	extra cæcaux	générotype
capense A. LOOSS, 1902	sacculations absentes	*id.*	*id.*	attribué à *richiardii* par OFENHEIM, 1900 syn. de *richiardii* pour DOLLFUS, 1937, p. 63
antarcticus V. WOOLCOCK, 1935	*id.*	*id.*	*id.*	
philippi V. WOOLCOCK, 1935	*id.*	*id.*	en partie extracæcaux en partie cæcaux	sous-genre *Reduzotrema* PIGULEVSKY, 1952
clelandi T. H. JOHNSTON, 1934 = *simile* T. H. JOHNSTON, 1934	*id.*	nombreuses petites masses régulières	*id.*	*id.*
rotundatum T. H. JOHNSTON, 1934	sacculations très faibles	groupes de petites masses subrégulières	presque complètement extracæcaux	*id.*
californiense H. W. STUNKARD, 1935	sacculations inconstantes	assez gros follicules par groupes séparés confluents	extracæcaux	
mexicanum Ed. H. MARKELL, 1956	sacculations bien prononcées	nombreuses petites masses lobées	*id.*	

From Dollfus, 1971

PROBOLITREMA RICHIARDII (Lopez,1888) Looss,1902

Sensu Dollfus, 1937

création du genre ***Probolitrema*** **A. Looss (1902, p. 855, 857, 858, 859, 860, 863 définition et fig. B. VI schéma du genre), caractérisé par les testicules et les vitellogènes entièrement extracæcaux, avec pour type *Pr. richiardii* (Lopez) et pour seconde espèce « *Pr. capense* Looss (= *Anaporrhutum richiardii* Ofenheim *nec* Lo-**

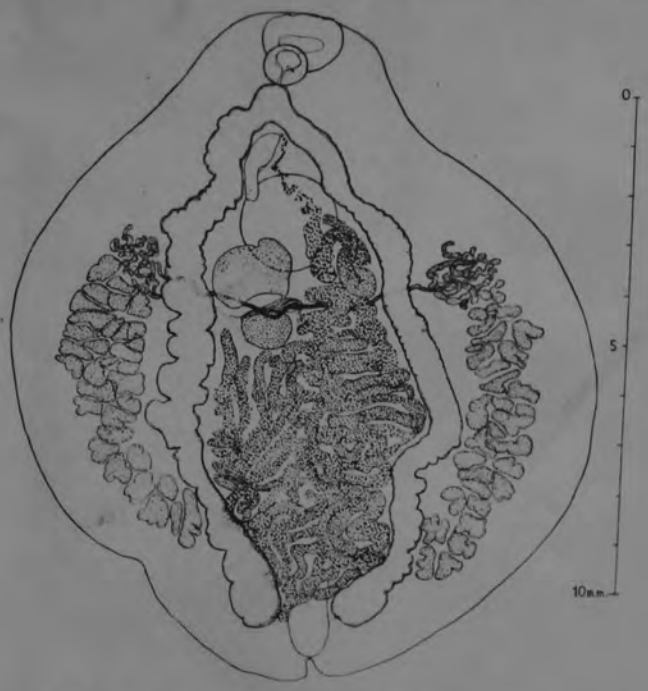

Fig. 1. — *Probolitrema richiardii* (C. Lopez 1888), individu vu par la face dorsale, préparation *in toto*.

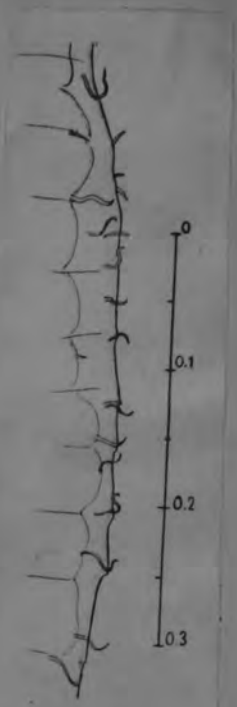

Fig. 2. — Spinules cuticulaires de l'individu de la fig. 1.

pez) ». Selon Looss, *capense* se distinguerait par ses ventouses à peu près d'égal diamètre, de *richiardii* à ventouse ventrale plus grande que l'orale.

T. Odhner (1910, p. 14) a réexaminé les spécimens types de *Probolitrema capense* Looss, du Musée de Berlin, il en a donné les dimensions en précisant le diamètre des ventouses (pour les grands spécimens longs de 20 mm., rapport des ventouses comme 3 : 1 ; pour les petits spécimens longs de 8-9 mm. rapport comme 2 : 3), concluant qu'avant de considérer définitivement *capense* comme une espèce séparée de *richiardii*, il fallait connaître les dimensions exactes des ventouses de la forme méditerranéenne.

J'ai mesuré les ventouses de la forme méditerranéenne parasite d'*Acanthias*, d'après un exemplaire (long de 10,5, large de 8,3) mis à ma disposition par R. Dieuzeide ; la v. o. mesure longit. 1,75, transv. 1,95, la v. v. mesure, 2 à 2,1 de diam. Il n'y a donc aucune raison de conserver *capense* comme espèce indépendante, ainsi que l'avait, justement, pressenti Odhner.

Je rappelle, avec Odhner (1910, p. 14, note) que le corps des *Anaporrhutum* est aplati, foliacé et celui des *Probolitrema* épais, charnu, bombé dorsalement, ventralement plat, même légèrement concave. Cette différence d'habitus, très accentuée, permet, à première vue, d'éviter la confusion.

Outre l'exemplaire récolté par Dieuzeide, j'ai examiné un exemplaire de provenance indéterminée (fig. 1), trouvé parmi les duplicata de l'Institut Zoologique de Strasbourg et aimablement mis à ma disposition par M. le professeur P. Marais de Beauchamp.

Cet exemplaire (monté dans le baume de Canada, après coloration au carmin) est long de 13 mm., large de 11,5, avec une ventouse orale mesurant longitud. 1 mm., transvers. 1,5, une ventouse ventrale de 2 mm. de diam. La cuticule, jusqu'à l'extrémité postérieure, porte des spinules grêles, peu rigides, se rebroussant facilement (fig. 2). On ne voit ni prépharynx, ni œsophage ; le pharynx, longitud. a 0,625, transvers. 0,875. Les cæca (1) montrent une indication de légère sacculation, peut-être due en partie à la contraction de l'individu lors de la fixation.

(1) Dans les cæca, il y avait des œufs en très grand nombre.

Les testicules sont au nombre de 26-30 de chaque côté et assez serrés, il peut y en avoir deux ou trois contigus au même niveau, mais leur disposition n'est pas régulière. L'ovaire (0,76 × 1,02) est nettement plus petit que le receptaculum seminis situé en avant de lui. Les vitellogènes sont en tubes contournés, formant, de chaque côté, un peu comme un glomérule.

Les œufs de la fin de l'utérus mesurent 59 × 52 ; mais, plus près de l'ovaire, il y a des œufs plus petits, par exemple mesurant 58 × 52, 56 × 48, 48 × 44 et jusqu'à 48 × 40 μ (1).

Distomum richiardii, LOPEZ.

Many specimens of this elegant little Trematode were taken from the perivisceral cavity of *Rhinodon typicus*. The species has recently been described by MONTICELLI,* who has found it in the body-cavity of *Acanthias vulgaris* and more rarely in *Mustelus vulgaris* and *Myliobatis aquila*, in the Bay of Naples.

From Shipley and Hornell, 1905

Probolitrema (*Probolitrema*) *richiardii* (Lopez, 1888)

Синоним: *Distoma richiardii* Lopez, 1888, nec *Anaporrhutum richiardii* в понимании Ofenheim, 1900

(Рис. 257)

Хозяева: акулы — *Squalus acanthias* (*Acanthias vulgaris*) из сем. *Squalidae*, *Galeorchinus mustelus* (*Mustelus vulgaris*) из сем. *Carchariidae* и скат *Myliobatis aquila* из сем. *Myliobatidae*.

Локализация: полость тела.

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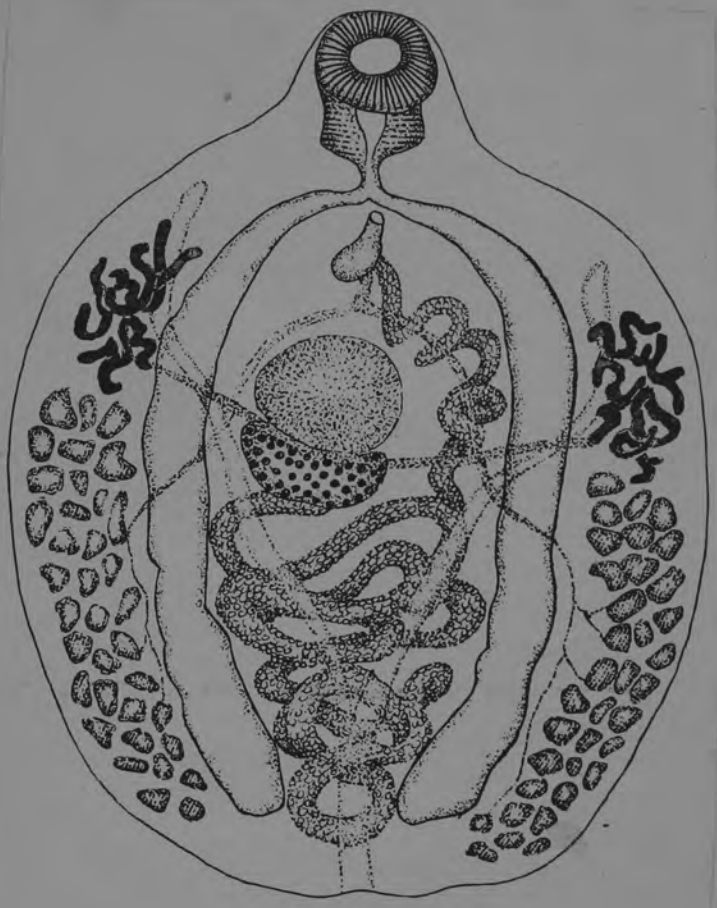
[1] Публикуется впервые.



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Probolitrema richiardii (C. Lopez, 1888),
var. **pteromylaei**, nov. var.

A cette espèce, je rapporte les spécimens récoltés dans la cavité générale, sur le foie d'un *Pteromylaeus bovina* (E. Geoffroy St-Hilaire).

Dimensions de deux spécimens en mm (sauf pour les œufs) :

Longueur et largeur du corps	7 × 5	8,4 × 5
Ventouse orale	0,312 (1) × 1,05	0,375 × 0,475
Ventouse ventrale	0,938	0,825
Pharynx	0,125 × 0,162	0,1125 × 0,1125
Œsophage	0,262	0,250
Ovaire	0,350 × 0,337	0,275 × 0,3625
Receptaculum seminis	0,60	0,550
Œufs (μ) protubérance comprise	54 × 33	59,9 × 33,3
	54,8 × 35,2	65,8 × 33,3
		56,8 × 33,3
	54,8 × 39,1	56,8 × 34,1
	54,8 × 43,1	60,9 × 35,2
Nombre de testicules :		
Côté droit	23	17
Côté gauche	18	21

Description. Le corps est convexe dorsalement, concave ou presque plat ventralement ; il est épais et de consistance charnue. Sa longueur dépasse un peu la largeur ; le contour est presque régulier. Le bord postérieur présente une indentation médiane qui correspond au pore excréteur. La ventouse ventrale est un peu en relief et son centre est situé à peu près à la fin du premier tiers de la longueur du corps.

A la ventouse orale, termino-ventrale, fait suite directement le pharynx, plus ou moins globuleux. L'œsophage est mince et à peu près deux fois plus long que le pharynx. Les cæca intestinaux s'écartent en direction postérieure, atteignent les bords latéraux de la ventouse ventrale, puis se dirigent vers l'extrémité postérieure du corps, mais ne l'atteignent pas. Leur trajet est un peu plus rapproché de la ligne médiane du corps que des bords latéraux. Leur parcours présente des sacculations et diverticules irréguliers sur leur bord externe et leur bord interne.

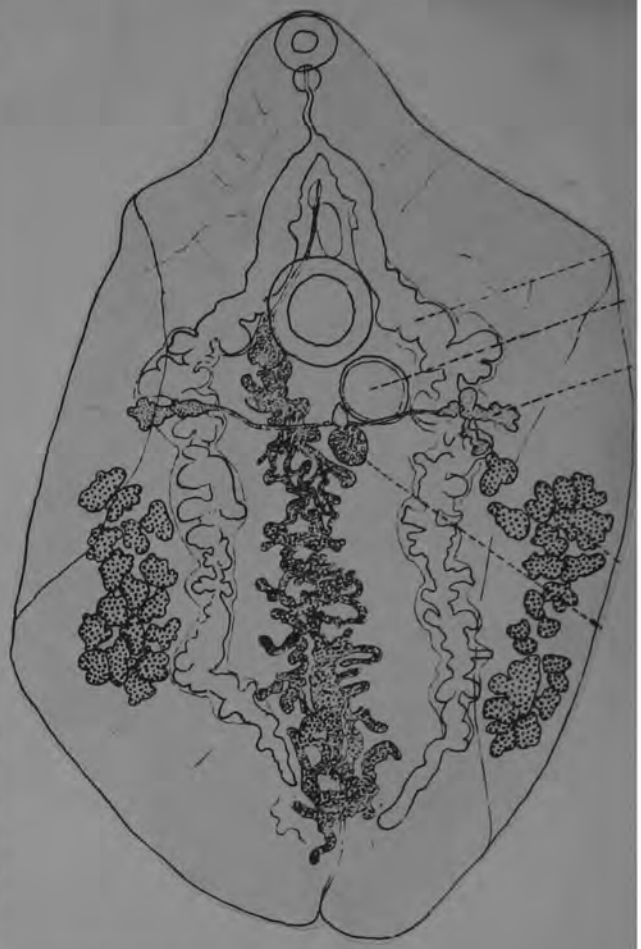
Dans environ le troisième tiers de la longueur du corps, sont groupés les testicules, complètement en dehors des cæca intestinaux ; ils sont en nombre variable, de forme irrégulière, plus ou moins lobulés. La plupart sont en contact les uns avec les autres, quelques uns laissent entre eux un petit espace. Les canaux déférents se rejoignent immédiatement en avant de la ventouse ventrale, aboutissant à la vésicule séminale. Celle-ci longitudinalement allongée, occupe, avec la *pars prostatica*, une grande partie de l'espace intercæcal à ce niveau et s'ouvre au pore génital, situé médianement, ventralement au bord postérieur de la bifurcation intestinale.

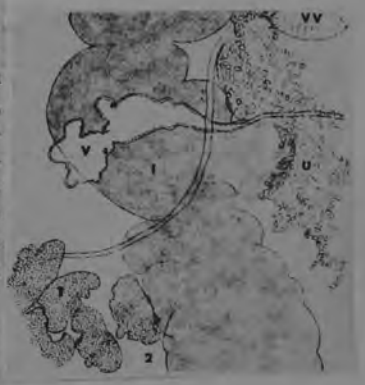
L'ovaire est subglobuleux, un peu à gauche de la ligne médiane, à une distance de la ventouse approximativement égale au diamètre de celle-ci. Contigu, ou presque, à la ventouse ventrale et à l'ovaire, un peu à gauche de la ligne médiane, se trouve le volumineux receptaculum seminis, son contour est régulièrement circulaire.

Les vitellogènes (fig. 2-5) sont situés à peu près au début du troisième cinquième de la longueur du corps, vers le niveau de la partie postérieure du receptacle séminal. Ils forment, de chaque côté, en avant des testicules, un bouquet de lobules irrégulièrement ramifiés, en majeure partie en dehors des cæca mais pouvant empiéter ventralement plus ou moins sur ceux-ci ; cela varie selon le côté du corps et selon les individus.

Le vitelloducte transverse passe ventralement au bord postérieur du receptaculum seminis et du bord antérieur de l'ovaire. Contigüe à ces deux glandes se trouve la glande de Mehlis. L'utérus forme de nombreuses sinuosités de part et d'autre de la ligne

(over)





médiane, dans l'espace intercæcal ; il s'étend postérieurement un peu plus loin que les cæca ; antérieurement, il passe à droite de la ventouse ventrale et gagne le pore génital. Les œufs, excessivement nombreux, à coque mince, ont une faible protubérance à un pôle ; je n'ai pas constaté l'existence d'un opercule.

De l'appareil excréteur, en Y, je n'ai pu voir que l'extrémité postérieure, tout le reste étant caché par les sinuosités utérines.

Discussion. Ces spécimens correspondent au genre *Probolitrema* A. Looss, où ont été admises 8 espèces (voir le tableau de la page 353) : trois d'entre elles ont été séparées dans le sous-genre *Reduxotrema* Pigulevsky, 1952, comme ayant les testicules sur les cæca, ou ayant quelques testicules empiétant sur les cæca, ou ayant quelques testicules dans l'espace intercæcal. Chez nos specimens, tous les testicules sont extra-cæcaux, ils appartiennent donc au sous-genre *Probolitrema* Pigulevsky, où sont été placées 5 espèces (*richiardii*, *capense*, *antarcticum*, *mexicanum*, *californiense*). La ventouse ventrale a un diamètre dépassant peu celui de la ventouse orale chez *capense*, *antarcticum*, *mexicanum*, alors que, chez nos spécimens, la ventouse ventrale est beaucoup plus grande que l'orale, ce qui existe seulement chez *richiardii* et *californiense*. Ces deux espèces sont très voisines l'une de l'autre. La redescription de *californiense* Stunkard par E. K. Markell (1953) a montré que les testicules ne sont pas toujours par petits groupes séparés, mais peuvent être aussi réunis de chaque côté en un seul groupe (voir Markell, 1953, fig. 2, 4, 5) comme chez les spécimens que j'ai rapportés à *richiardii* (en 1935, p. 200 et 1937, p. 62-63, fig. 1). De bons caractères permettant de distinguer *californiense* de *richiardii* restent à préciser. Rappelons que, chez *californiense*, les sacculations des cæca sont inconstantes ou très peu développées, alors que, chez *richiardii*, si elles sont quelquefois à peine indiquées (fig. 52 de la pl. V de Monticelli, 1893), elles peuvent aussi être très fortement développées, comme je l'ai constaté chez les spécimens de ma collection, dont un est certainement méditerranéen comme le type de l'espèce. Dans la description originale, Corrado Lopez (1888, p. 137) dit que, chez les individus qu'il a examinés, l'intestin était « dendritico », caractère non observé par Monticelli. Celui-ci (1893, pl. V, fig. 52) figure un individu (d'après plusieurs préparations *in toto*) dont les cæca ont, par endroits, les bords un peu ondulés, mais ces ondulations ne sont pas des sacculations, et, dans sa description anatomique de l'espèce, Monticelli n'en parle pas. Plusieurs fois, *richiardii* a été retrouvé et de nombreux auteurs en ont fait mention et discuté ses caractères, sans qu'il soit question de sacculations des cæca. C'est seulement dans ma publication de 1937 (p. 63 et fig. 1) que l'existence de ces sacculations est relatée. La figure d'ensemble que j'ai donnée alors est, je crois, la seule qui ait été publiée depuis celle de Monticelli.

Il est évident que mes spécimens de *Pteromylaeus* diffèrent peu de *richiardii* tel que l'a décrit et figuré Monticelli, mais quelques différences sont manifestes : l'ovaire, le receptaculum seminis, la glande de Mehlis, sont beaucoup plus petits et celle-ci n'est pas située sur le côté gauche du receptaculum seminis ; les vitellogènes sont bien moins étendus et plus postérieurs (d'après Monticelli ils sont en partie au niveau du receptaculum seminis, en partie en avant) ; les cæca intestinaux sont sacculés ; les testicules sont beaucoup moins nombreux, ils s'étendent moins loin, antérieurement et postérieurement, beaucoup sont en contact les uns avec les autres, alors qu'ils sont, d'après la figure de Monticelli, tous séparés les uns des autres.

Les œufs ont une protubérance polaire, alors que chez ceux de la forme-type décrite par Monticelli, il n'y en a pas de trace. J'ai constaté son absence chez les œufs des spécimens que j'ai rapportés en 1935 et 1937 à *richiardii*, sa présence est un bon caractère distinctif.

Me fondant sur les différences ci-dessus énumérées, je propose de considérer comme une variété de *richiardii* les spécimens récoltés chez *Pteromylaeus bovina* (E. Geoffroy St-Hilaire).

Chez les spécimens rendus transparents, il suffira d'exa
les œufs pour distinguer immédiatement la nouvelle variét
la forme-type.

From Dollfus, 1971

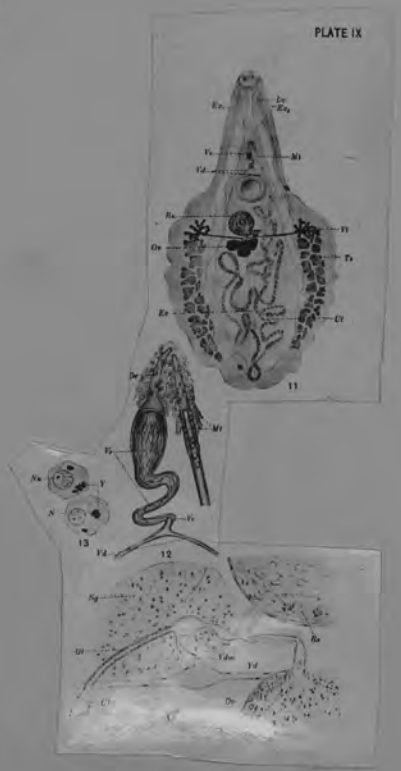
Gorgoderidae

Probolitrema antarcticus Woolcock ,1935

Host: coelom of Mustelus antarcticus, gummy shark
Locality: Port Philip Bay, Victoria

Condensed description: Length 5. to 10.5 mm., width averages ##5 mm. (3 to 6.5 mm.) . Body flattened, oval, smooth. Oral sucker similar to P.philippi but the acetabulum is larger never over 1½ times the oral sucker. Pharynx 0.5 mm. in transverse diameter. Esophagus twice the length of the pharynx. Cæca wide, unbranched, but may show a number of small sacculations. Excretory vesicle a tube extending to posterior border of ovary where it branches into two of small caliber which extend to near the anterior end. Male and female pores separate,median, but without papillated depression. Testes 24 to 30 on each side as in P.philippi. The vasa deferentia unite directly anterior to acetabulum lead immediately into the long,narrow, slightly coiled seminal vesicle, the terminal portion of which expands into a simple, more or less oval sac,sometimes inconpletely divided into two.

Ovary distinctly lobed, usually 3 lobes (sometimes 4 or 5). Seminal receptacle present (sometimes eggs in it). Laurer's canal absent. Vitellaria of two lateral branched glands mainly extracecal. Uterus as in P.philippi but narrower . Eggs 36 to 45 by 35 to 40 μ



Differs from the type (P.richiardii) and and from P.capense (Ofenheim) , a closely related form in the disposition of the vitellaria elongate preacetabular region, form of uterus, and sucker ratio. Also from the type in the excretory system. It differs from P.clelandi (Johnston) and P.simile (Johnston) in sucker ratio, in smooth cuticle, and in form of testes. Most like P.rotundatum (Johnston) in the long narrow esophagus,conspicuous shell gland, smaller and rounder eggs, more narrow uterus, and different form of the vitellaria.

Jorgodtridae

Probolitrema californiense Stunkard, 1935

Discussion: These worms differ from both P. richiardii and P. capense in their smaller size, smaller sizof of all organs, especially the gonads, and a smaller number of testes. They are larger than p. rotundatum; the suckers, genital organs and eggs are larger, and they differ in form of vitellaria. They differ from P. clelandi and P. simile in size of acetabulum, shape of ovary, and in shape, number, and distribution of testes. These features may serve as a differential diagnosis.

Specific diagnosis: With the characters of the genus Probolitrema. Sexually mature specimens 7-13 mm long and 5.7- 10.2 mm wide. Acetabulum 1.2-2.4 mm in diameter. Oral sucker a bout 0.75 mm long and 1 mm wide. Testes extracecal, 16 -26 follicles in each testis. Seminal vesicle divided into two sections. Ovary lobed, 0.35-0.6 mm long, and 0.54-0.925 mm wide. Vitellaria poorly developed. Eggs 75 by 45 μ .

Host: Myliobatus californicus.

Locality: Monterey Bay, California.

Type Specimen: In the Department of Lower Invertebrates, American Museum of Natural History, New York.

FIG. 1. *Probolitrema californiense*, ventral view.
ep. excretory pore; gp, genital pore; ov, ovary; sr, seminal receptacle; sv, seminal vesicle; ts, testis; vt, vitellaria.

Proboscitrema californiense Stunkard, 1935

from Markell, 1953
Trans. Amer. Micros. Soc. m72(1):68-77

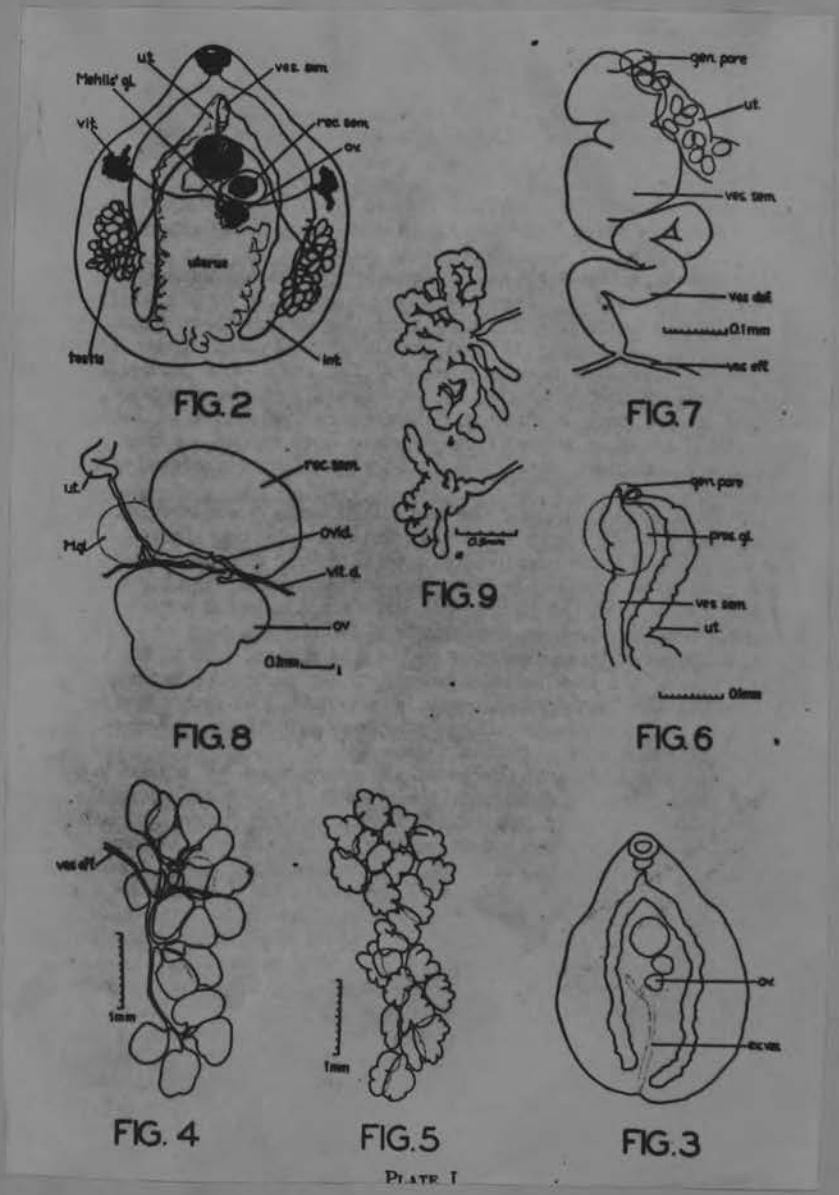


FIG. 2 FIG. 7

FIG. 9

FIG. 8 FIG. 6

FIG. 4 FIG. 5 FIG. 3

PLATE I

Probolitrema (*Probolitrema*) *capense* Looss, 1902

Синоним: *Anaporrhutum richiardii* в понимании Ofenheim, 1900.

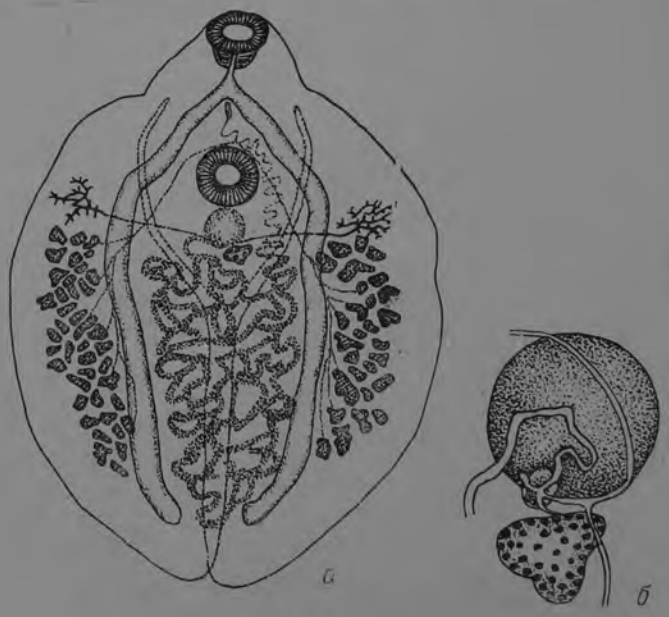
(Рис. 259)

Хозяин: акула (*Scyllium* из сем. *Scyllidae*).

Локализация: полость тела.

Место обнаружения: Атлантический океан у южных берегов Африки (Капштадт).

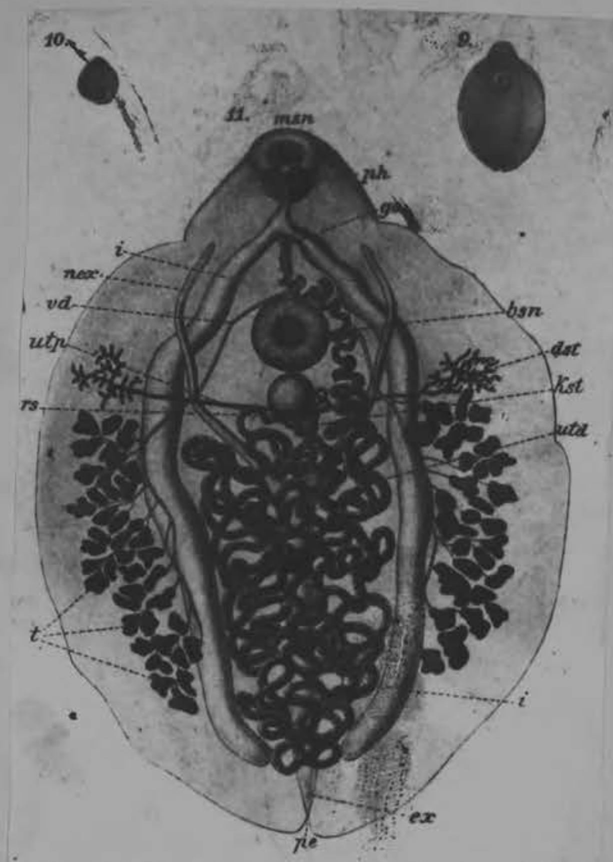
Историческая справка Офенгейм (Ofenheim 1900) обнаружил в полости тела акулы (*Scyllium*) у берегов Африки близ Капштадта трематоду, которую отнес к ранее описанному Лопецом (Lopez, 1888) и Монтичелли (Monticelli, 1893) виду. Офенгейм перевел *Distoma richiardii* Lopez в свой новый род *Anaporrhutum*. Несколько позже Лоосс (1902), сравнивая рисунки и описание паразита по работам Офенгейма, Монтичелли и Лопеца, нашел отличия у офенгеймовского вида. Наиболее существенным признаком Лоосс считал одинаковую величину присосок у офенгеймовского вида, в то время как у вида, описанного Монтичелли и Лопецом, брюшная присоска значительно крупнее ротовой. Поэтому Лоосс выделил описанного Офенгеймом паразита в новый вид и перевел его в свой новый род *Probolitrema*. Новый вид был назван *Pr. capense* по месту его обнаружения. Ряд последующих авторов: Люэ (1906), Травассос (1922), Бейлис (1927), Стенкэрд (1935), Вулкок (1935) и Дольфю (1935) разделили точку зрения Лоосса. Однако Т. Джонстон (1934), сравнивая *Pr. richiardii* с *Pr. capense*, не нашел убедительных различий между ними. «Описание и рисунок Офенгейма (1900) *P. richiardii*,— пишет Джонстон,— который Лоосс (1902) рассматривает как новый вид и называет *P. capense*, не основательно. У одного из этих видов присоски приблизительно равные, у другого брюшная присоска значительно крупнее. Остальная анатомическая характеристика лооссовского вида вполне сходна с таковой у *P. richiardii*» (Lopez). Несомненно, величина присосок у различных экземпляров одного и того же вида может колебаться. Но соотношения размеров ротовой и брюшной присосок у двух одинаковой зрелости паразитов, как *Pr. richiardii* и *Pr. capense*, в общем остаются более или менее постоянными. Если, скажем, брюшная присоска крупнее, то, несмотря на индивидуальные колебания в размерах обеих присосок у разных паразитов одного и того же вида, брюшная в общем будет превосходить по размерам ротовую. Для иллюстрации приведем результаты измерения присосок у нескольких экземпляров *Phyllodistomum angulatum*, найденных нами у рыб рр. Волги, Невы и других мест. При этом, во избежание повторений одинаковых размеров, приведены только различные варианты величины ротовой и брюшной присосок, а также их отношение друг к другу.



а б

Problitrema capense Looss, 1902

Syn: the Anaporrhutum richardii of Ofenheim, 1900



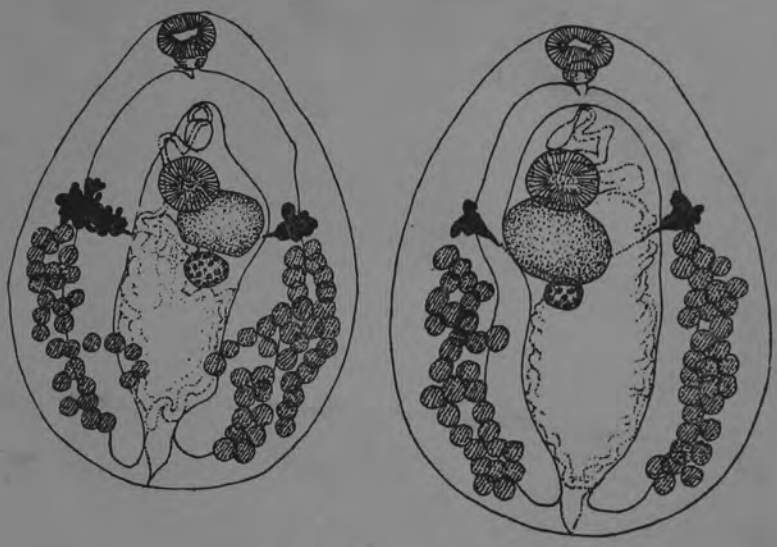
From Ofenheim 1900

43. **Probolitrema clelandi** Johnston, 1934

Host: *Acanthias* sp., dog fish; body cavity.

Locality: Dunedin.

A specimen of this species measuring about 19 by 10 mm. was given to me by Marion Fyfe of Otago University. Johnston's type specimen from *Mustelus antarcticus* from South Australia was 10·5 mm. long.



261

Probolitrema (*Reduxotrema*) *clelandi* T. Johnston, 1934

Синоним: *Probolitrema simile* T. Johnston, 1934

(Рис. 261)

Хозяин: акула (*Mustelus antarcticus* из сем. *Carchariidae*).

Локализация: полость тела.

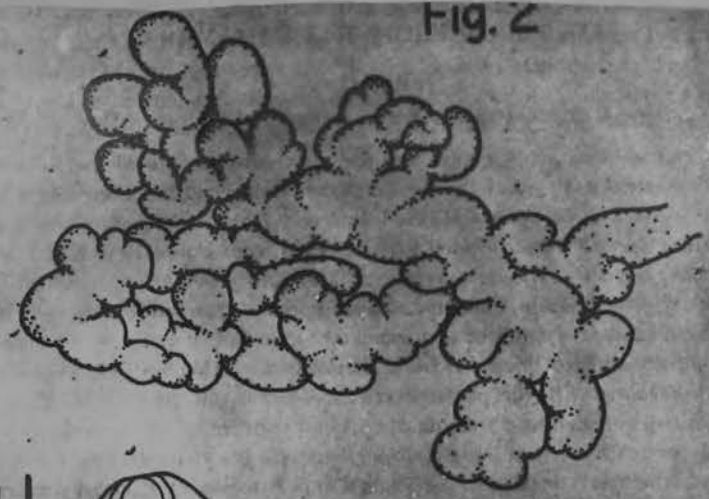
Место обнаружения: берега Южной Австралии и Тасмании.

Историческая справка В своей первой работе 1934 г. «New Trematodes from South Australian Elosmobranchs» Т. Джонстон описал два новых вида проболитрем: *Pr. clelandi* и *Pr. simile*. Последний вид он характеризует следующим образом. Паразит полости тела акулы *Mustelus antarcticus* из семейства *Carchariidae*, у берегов Южной Австралии.

Форма тела паразита яйцевидно-овальная, с несколько более заостренным передним концом и тупым задним. Тело сплющено в дорзо-вентральном направлении. Кутикула гладкая. Длина червя 11—13 мм, наибольшая ширина 8 мм. Ротовая присоска 1,4 мм в диаметре; брюшная 1,7 мм в поперечном сечении. Обе присоски помещаются в передней трети тела червя. Мышечный фаринкс округлой формы. Пищевод трубковидный, очень короткий. Ветви кишечника простые, трубковидные, довольно толстые, немного не доходят до заднего конца тела паразита. Выделительная система построена по общему для проболитрем типу. Семенники круглые, расположены симметричными группами, более 30 с каждой стороны, кнаружи от кишечника и частью на кишечных стволах, 0,3—0,5 мм в диаметре. Мужское половое отверстие рядом с жен-

P. Mexicana Marshall, 1956

Fig. 2



0.5mm

Fig. 1

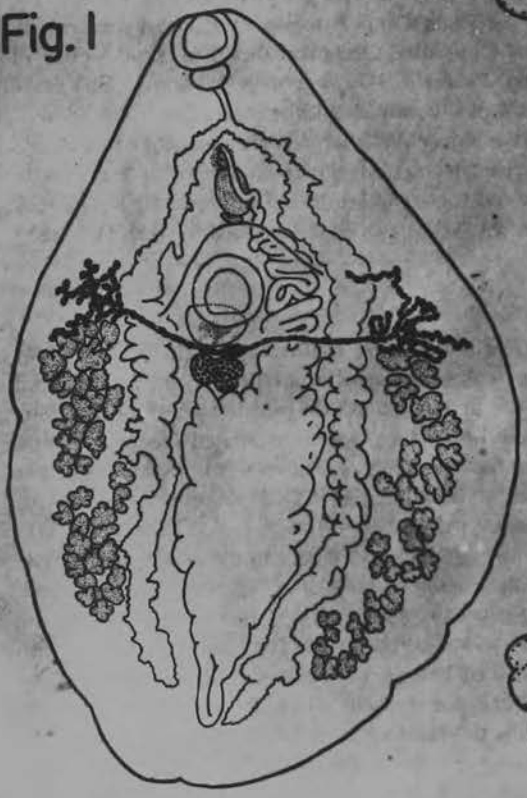
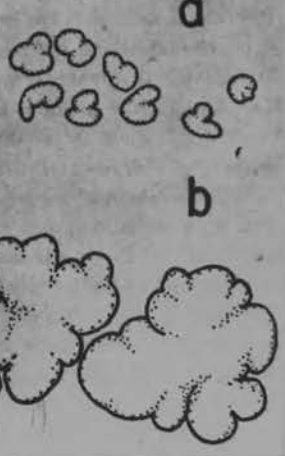


Fig. 3



Gorgoderidae

Probolitrema philippi Woolcock,1935

Host: coelom of Heterodontus philippi (a shark)
Locality: Port Philipp Bay, Australia

Condensed description: Size 6 mm. by 3.5 mm. Body flattened, elliptical and deep. Ventral sucker 1/3 from anterior end, circular, roughly twice the diameter of the oral sucker. Pharynx large, esophagus short, ceca wide, unbranched, not quite reaching the posterior end. Excretory pore dorsal, near posterior end, excretory vesicle tubular, not clearly seen. Nervous system conspicuous. Genital pores separate, close together, male slightly anterior, median, just behind bifurcation, in a depression covered with small papillae. Testes about 24 on each side, varying from entire to deeply lobate. The ducts unite at the anterior border of the acetabulum and pass foward to the short, tubular, slightly coiled seminal vesicle. No cirrus or cirrus sac.

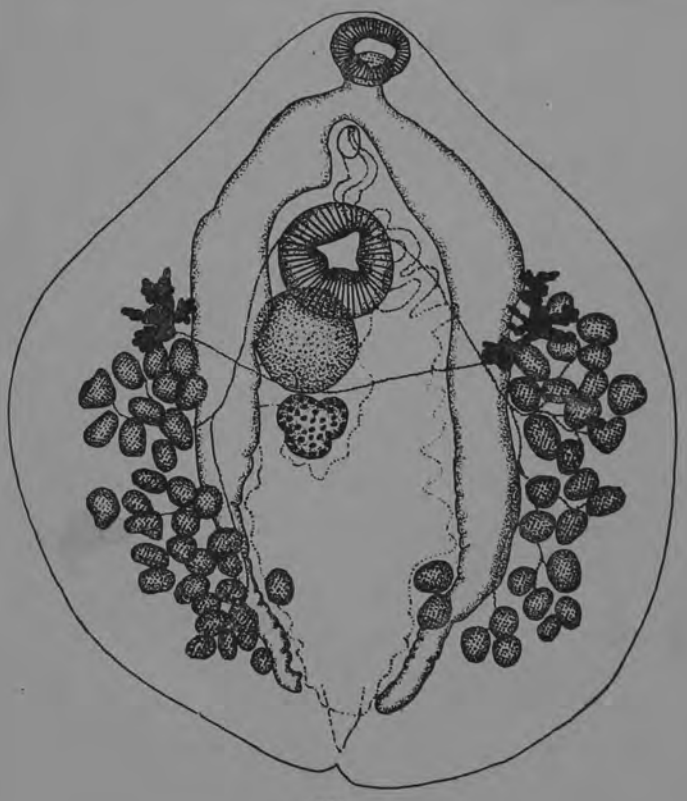
Ovary small, indistinctly 3-lobed, containing yolky granules. Large seminal receptacles. No Laurer's canal. Uterus almost to posterior end, filling space between ceca. Vitelline glands very small, in two sets, extracecal. Eggs numerous, oval, some spherical. Oval eggs 48 to 60 by 36 to 42 µ/ Spherical eggs 30 to 46 µ in diameter.

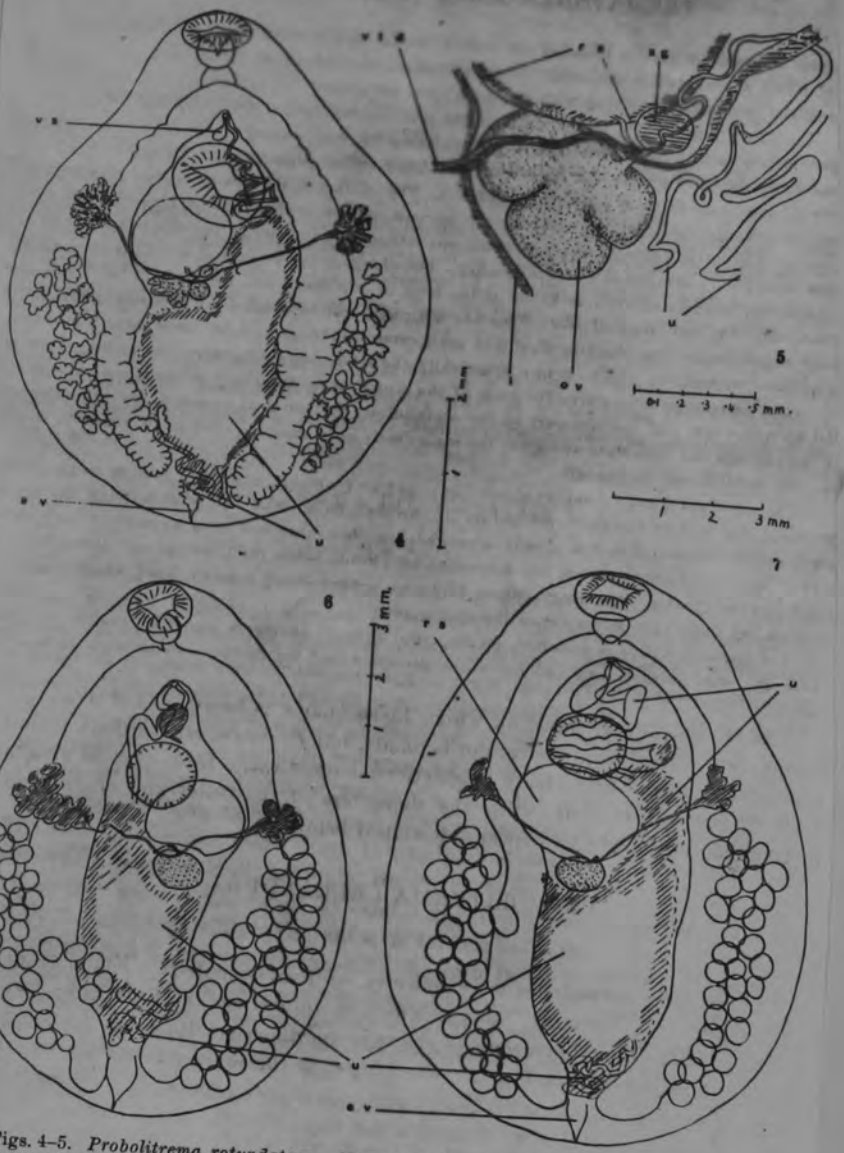
Probolitrema (*Reduxotrema*) *rotundatum* T. Johnston, 1934

(Рис. 263)

Хозяин: скат (*Trigonorrhina fasciata* из сем. *Rhinobatidae*)
Локализация: брюшная полость.
Место обнаружения: берега Южной Австралии (порт Виллюнга).

Описание вида (по Т. Джонстону, 1934). Форма тела грушевидно-овальная, с несколько заостренным передним концом, где находится ротовая присоска, и закругленным задним концом. Кутикула гладкая. Длина червя 7,8 мм, наибольшая ширина 6,7 мм. Ротовая присоска овальной формы, размером 0,7 × 0,8 мм. Брюшная присоска круглая, 1,2 мм в диаметре. По размеру ротовая присоска относится к брюшной, как 2 : 3. Мышечный фаринкс овальной формы; наибольшая ширина его 0,5 мм. Пищевод очень короткий и толстый. Ветви кишечника простые, трубковидные, довольно толстые, но не одинакового сечения в разных местах: передние отделы кишечной трубки более широкие, задние — узкие. Кишечные стволы не доходят до заднего конца тела паразита. Отверстие выделительной системы расположено в заднем конце тела червя в небольшом углублении, образованном кутикулярной складкой. Семенники расположены группами по краям тела, кнаружи от кишечных ветвей, но некоторые из семенников заходят даже в пространство между кишечными ветвями. Количество семенников с одной стороны 28, с другой — 34. Форма их большей частью эллипсоидная, но у некоторых семенников края неровные и даже имеются небольшие лопасти. Размер семенников от 0,28 до 0,5 мм в длину и от 0,3 до 0,4 мм в ширину. Мужское половое отверстие рядом с женским; они находятся посередине между ротовой и брюшной присосками, тотчас же кзади от бифуркации кишечника. Концевой мужской половой аппарат снабжен семенным пузырьком. Яичник трехлопастной, расположен в средней части тела паразита позади брюшной присоски и семяпри-





Figs. 4–5. *Probolitrema rotundatum.* 4. ventral view; 5. ovary, etc., of young specimen, just entered on egg-bearing.

Fig. 6. *Probolitrema clelandi.*

Fig. 7. *Probolitrema simile.*

Reference to lettering: e.p. excretory pore; i. intestine; od. oviduct; ov. ovary; r.s. receptaculum seminis; sal. salivary glands; s.g. shell glands; t. testes; t.vt.d. transverse vitelline duct; u. uterus; v. vagina; v.s. vesicula seminalis; vt. vitellarium; vt.d. vitelline duct.

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J. Parasitol (1956 No. 1-P. 5

Four trematodes, found in the body cavities of elasmobranch fishes from Santa Inez Bay, on the Gulf of California, Baja California, were kindly turned over to me for identification by Dr. Clark P. Read. Two were from *Urobatus maculatus*, one from *Dasyatis brevis*, and one from *Mustelus lunulatus*. The worms had been fixed in Bouin's fluid, and were stained with borax-carmine. They were found to belong to a new species of *Probolitrema*, which is here described as *Probolitrema mexicana*.*

Probolitrema mexicana, n. sp.

Specific diagnosis: With the characters of the genus *Probolitrema*. Sexually mature specimens 3.6 to 17.5 mm long, and from 2.6 to 14.0 mm in greatest width. Ratio of oral to ventral sucker, 2:3. Intestinal ceca finely diverticulate to grossly saccate. Testes extracecal; from 17 to 39 lobate follicles in each testis. Vas deferens coiled, expanded anteriorly into large muscular seminal vesicle and smaller pars prostatica. Ovary deeply lobate; three to five lobes. Vitellaria with irregularly nodular tubular branching processes. Ova 50–66 by 34–40 microns.

Type host: Mustelus lunulatus.
Other hosts: Urobatus maculatus, Dasyatis brevis.
Habitat: Coelomic cavity.
Locality: Santa Inez Bay, Baja California, Mexico.
Type specimen: U. S. Nat. Mus. Helm. Coll., No. 49354.

DESCRIPTION

The worms are irregularly oval, their greatest width being approximately equidistant from the anterior and posterior ends. The posterior end is usually rounded, with an indentation in the midline marking the site of the excretory pore; the anterior end may narrow abruptly forming a definite neck, or taper uniformly to the oral sucker.

Measurements given hereafter, unless otherwise noted, are of the type specimen (Fig. 1), a worm 13.7 mm in length. The oral sucker is terminal, and measures 1.12 mm across by 0.89 mm in length. The acetabulum is 1.46 mm in diameter, and is situated between one-quarter and one-third of the body length from the anterior end. The ratio between oral and ventral suckers seems quite constant, though the suckers are much larger in proportion to total body size in the smaller (and presumably younger) worms. The pharynx is nearly spherical, fitting closely against the posterior wall of the oral sucker, and measures 0.64 mm by 0.51 mm. The esophagus is thin-walled, with minute pointed diverticula coming off on all sides, and is 0.68 mm in length. The intestinal ceca, which like the esophagus have a fundamentally diverticulate structure, become grossly saccate when distended. The finer sharply pointed diverticula are not visible in the areas distended by food, but appear along the entire course of the ceca wherever they are distended. The ceca lie about half-way in toward the midline from the sides of the body.

The testes are extracecal, each consists of 17 to 39 separate follicles. Each testicular mass occupies an area extending between one-half and three-fifths of the length of the body. The individual follicles are deeply lobed in the larger worms (Fig. 3, b), but unlobed or very simply lobed in the smaller ones (Fig. 3, a). The duct system uniting the follicles could not be traced in its entirety in any of the specimens, but enough could be seen to indicate that it is essentially the same as that found in other species of the genus: tubules from several follicles unite, the tubules thus formed unite with similar ones, and finally the collecting tubules come together to form the vas deferens. The vasa efferentia can be traced to the midline, where they unite anterior to the ventral sucker to form a vas deferens. The posterior portion of the vas deferens, coiled upon itself, is approximately 0.13 mm in width, and expands anteriorly into a muscular seminal vesicle, 1.02 mm long by 0.57 mm wide. From this, another coiled tubule, the pars prostatica, 0.21 mm in diameter and surrounded by a dense cluster of cells, leads to the genital pore. The genital pore is situated in the midline and posterior to the bifurcation of the intestine.

The three- to five-lobed ovary lies somewhat anterior to the middle of the body, and may be on either side of the midline. In the type specimen, it measures 0.81 mm in width by 0.59 mm in length. Anterior to the ovary, and partly dorsal to the ventral sucker lies the rounded thin-walled seminal receptacle, containing a mass of spermatozoa. Between the ovary and seminal receptacle run the vitelline ducts. The details of the connections between the vitelline ducts, oviduct, Mehlis' gland and the uterus cannot be made out, although Mehlis' gland is visible between the ovary and seminal receptacle. The vitellaria are extracecal, and may be compact, or quite loosely arranged. Their structure is tubular (Fig. 4) with one or several main stems, from which short or long irregularly nodular branches arise. The branches may anastomose, or branch secondarily. The uterus (Fig. 1) fills the area between the intestinal ceca posterior to the ovary, and runs on the antovarian side of the body up past the ventral sucker to open at the genital pore. The eggs become considerably enlarged during their passage through the uterus; those in the terminal portions measure 50–66 by 34–40 microns.

The excretory vesicle was poorly visualized, and could not be followed throughout its entire length in any of the specimens. Reconstruction of serial sections through one of the smaller worms indicates that the bladder runs anteriorly from the excretory pore, approximately in the midline, to bifurcate just posterior to the level of the ovary. In one worm, the posterior portion of the bladder wall could be clearly seen, and it was noted to have numerous short side-branches.

DISCUSSION

Seven species of *Probolitrema* have been previously described; their diagnostic characteristics are summarized by Markell (1953). *P. mexicana* differs from the other species of the genus in possessing diverticulate or saccate intestinal ceca. Johnston (1934) described small sacculations appearing posteriorly in the ceca of *P. rotundatum*, and these may also be seen occasionally in *P. californiense*, but are quite unlike the fine, pointed diverticula found in the undistended portions of the ceca of *P. mexicana*. Branching of the intestinal ceca is seen in the genera *Petalodistomum* as described by Johnston (1913) and *Nagmia* as described by Nagaty (1930), although varying considerably in degree in the different species. These two genera differ from *Probolitrema*, however, in possessing vitellaria which are intracecal in position.

SUMMARY

A new species of anaporrhutine trematode, *Probolitrema mexicana*, is described from elasmobranchs of Santa Inez Bay, Baja California, Mexico.

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PLATE I

EXPLANATION OF FIGURES

FIG. 1. *Probolitrema mexicana*, whole mount, showing male and female reproductive systems.

FIG. 2. Vitelline gland from a worm 17.5 mm in length.

FIG. 3, a. Testis follicles from a worm 3.6 mm in length.

FIG. 3, b. Testis follicles from a worm 17.5 mm in length.

All figures drawn with the aid of a camera lucida.

PROBOLITREMA

Progorgodera ~~gen. n.~~ BROOKS AND BUCKNER, 1976

Diagnosis: Gorgoderidae. Forebody tapered anteriorly, hindbody foliate. Oral sucker terminal with ventroterminal aperture. Pharynx absent; ceca simple, may be sinuous, terminating near posterior end of body. Acetabulum preequatorial. Testes multiple, postacetabular, intercecal, in 2 longitudinal rows. Seminal vesicle saccate; cirrus sac and cirrus absent. Genital pore median, postbifurcal. Ovary submedian, pretesticular. Seminal receptacle absent. Vitellaria compact, paired behind acetabulum. Uterus occupying most available space in hind body. Eggs embryonated. Excretory vesicle I-shaped. Parasites in urinary bladder of amphibians. Type species:

Progorgodera foliata Brooks and Buckner, 1976

Progorgodera foliata sp. n. BROOKS AND BUCKNER, 1976
(Figs. 1–2)

Description (based on 16 specimens): Body 1.9 to 2.9 mm long by 0.9 to 1.4 mm wide at mid hindbody. Oral sucker 235 to 413 long by 211 to 390 wide. Acetabulum 30 to 35% body length from anterior end, 381 to 753 in diameter. Ratio of sucker widths 1:1.7 to 1.9. Esophagus 175 to 310 long; cecal bifurcation at mid forebody. Testes irregular, rows may extend to cecal tips. Genital pore immediately postbifurcal. Ovary irregular to lobed, 90 to 300 long by 50 to 285 wide. Mehlis' gland and Laurer's canal present. Vitellaria immediately postbifurcal, multilobed, lobes shallow. Extracecal uterine loops extending to ovarian level. Eggs 26 to 30 long by 18 to 22 wide. Excretory vesicle with associated gland cells, reaching nearly to level of ovary; pore terminal.

Host: *Siren intermedia*.

Site: Urinary bladder.

Locality: Roadside ditches, 2 miles north of Gorham, Jackson Co., Illinois.

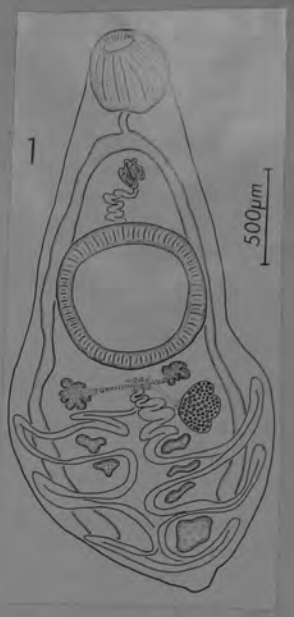
Holotype: USNM Helm. Coll. No. 73520.

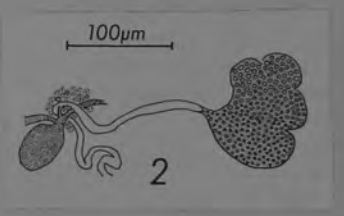
Paratypes: USNM Helm. Coll. No. 73521; Univ. Neb. State Mus., H. W. Manter Lab. No. 20268, and in collections of authors.

Etymology: The generic name means precursor to *Gorgodera*, a genus of amphibian digeneans, while the specific name refers to the foliate hindbody.

Remarks

In most of our specimens of *P. foliata*, the testes are dispersed and degenerate or inconspicuous. The holotype (Fig. 1) has four testes on the left side and two on the right, but we are not certain this is the normal configuration. By having multiple testes arranged in two longitudinal rows, *P. foliata* resembles members of *Gorgodera* Looss 1899 but by having a foliate hind body, it resembles members of *Phyllodistomum* Looss 1899. Because the new species exhibits the diagnostic features of two genera, the new genus is erected for it.





5 SUBJECT DIVIDERS

PROGORGODERA

Name________________________________ School____________________

Address______________________________ Telephone__________________

WEEKLY SCHEDULE:

Period	Time		Monday		Tuesday		Wednesday		Thursday		Friday	
	From	To	Room No.	Class	Room No.	Class	Room No.	Class	Room No.	Class	Room No.	Class
Home Room												
1												
2												
3												
4												
5												
6												
7												
8												
Extra Curricula												

SCHOOL VACATIONS:

Thanksgiving From____________ To____________

Christmas From____________ To____________

Winter Vacation From____________ To____________

Spring Vacation From____________ To____________

Easter Vacation From____________ To____________

HOLIDAYS:

Columbus Day____________________

Election Day____________________

Veterans Day____________________

Lincoln's Birthday____________________

Washington's Birthday____________________

Memorial Day____________________

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STAPHYLORCHIS Travassos,1920

Large Anoporrhutinae with the posterior part more or less rounded. A strong muscular pharynx present; ceca sinuous but without diverticula. Testes divided into a large number of small spherical bodies and are external to the ceca. Vitelline glands between the intestinal ceca. Large seminal receptacle present. In the body cavity of rays, Australia.

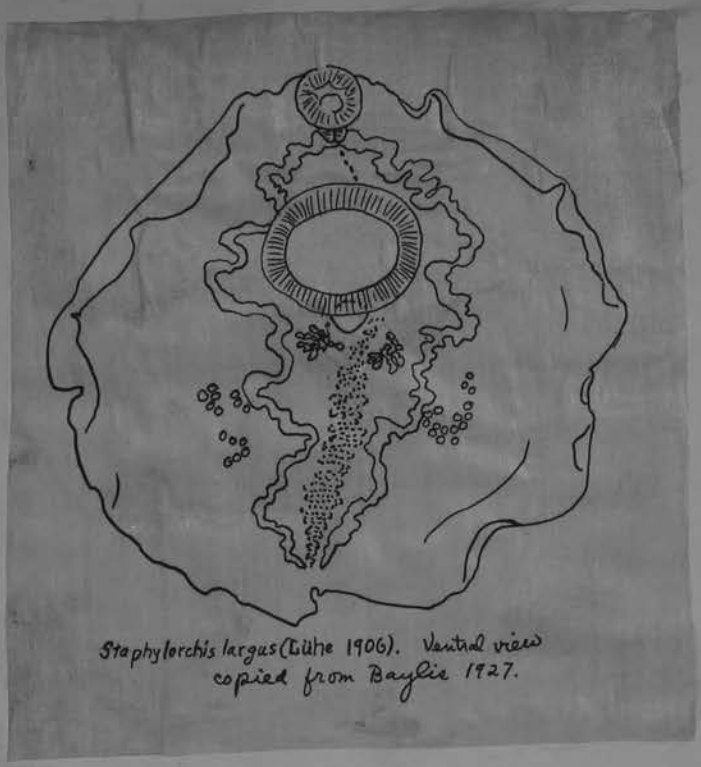
Type species: S.cymatodes (Johnston,1913) Trav.,1920

Other species:

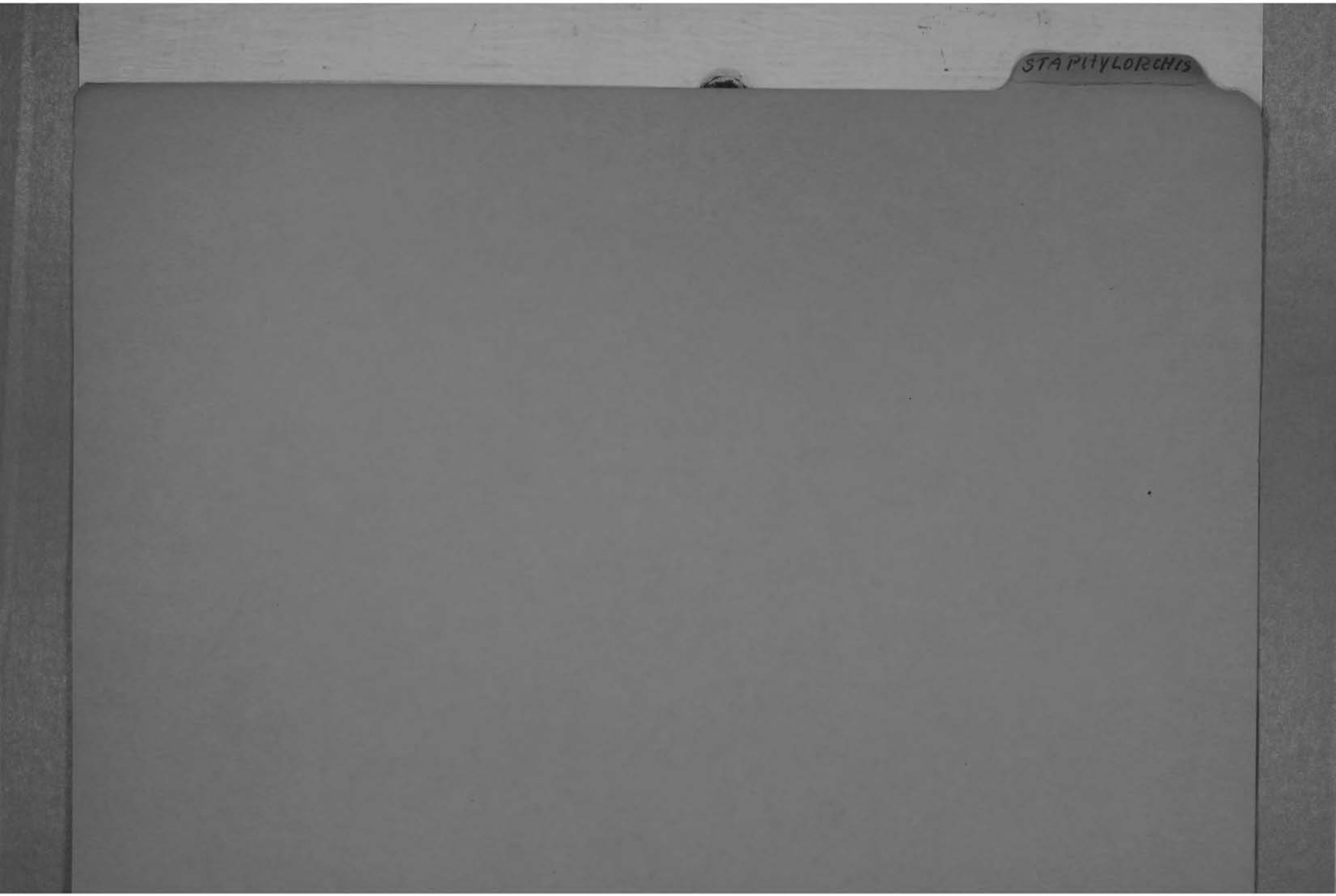
Staphylorchis Travassos, 1920

Generic diagnosis. — Gorgoderidae, Anaporrhutinae: Body petaloid, with forebody more or less distinctly marked off. Oral sucker followed by pharynx, esophagus short, ceca simple, strongly winding and terminating at posterior extremity. Acetabulum comparatively small, near anterior extremity. Testes divided into numerous small widely diffused follicles, extending almost entire length of hindbody. Genital pore postbifurcal.

Staphylorchis largus (Luhe, 1906).



Staphylorchis largus (Lühe 1906). Ventral view copied from Baylis 1927.


STAPHYLORCHIS

Genus *Winteria* ~~gen. nov.~~ LAMOTHE, 1969

Diagnosis Genérica: Gorgoderidae, Anaporrhutinae. Cuerpo oval, casi circular, ventosa oral seguida de una faringe musculosa, esófago corto, ciegos intestinales con numerosas evaginaciones pequeñas, terminan cerca de la extremidad posterior del cuerpo. Acetábulo mayor que la ventosa oral, preecuatorial. Testículos por fuera de los ciegos y en la parte más ancha del cuerpo, en número de 9 a 13 de cada lado, lobulados. Sin bolsa del cirro. Vesícula seminal preacetabular, sinuosa. Poro genital a nivel de la parte media ventral de la faringe. Ovario relativamente pequeño, ovoide o esférico a la izquierda o derecha de la línea media, postacetabular, intercecal. Glándula de Mehlis bien definida. Sin conducto de Laurer. Receptáculo seminal, grande, voluminoso, esférico a la izquierda o derecha de la línea media. Útero intercecal, rama ascendente con un metratermo. Huevos ovoides y operculados. Glándulas vitelógenas intercecales, dendriformes, una a cada lado del ovario, con un receptáculo vitelino pequeño. Vesícula escretora tubular, hasta el borde posterior del ovario. Parásitos de la cavidad del cuerpo de tiburones.
Tipo: *Winteria pacifica* (Caballero, 1945) n. comb.

Discusión: Yamaguti (1958) reconoce cuatro géneros para esta subfamilia: *Anaporrhutum* Ofenheim, 1900; *Petalodistomum* Johnston, 1914; *Staphyllorchis* Travassos, 1920 y *Nagmia* Nagaty, 1930, que se caracterizan por parasitar la cavidad del cuerpo de elasmobranquios.

Aunque Johnston (1934), Caballero (1945) y Caballero y col. (1956) no dan validez al género *Nagmia*, consideran que las especies confinadas a este género son válidas para *Petalodistomum* Johnston, 1914. Dollfus (1937) relega al género *Nagmia* a la categoría de subgénero y Pigulewsky (1952) crea dos subgéneros: *Petalodistomum* y *Staphyllorchis*, e incluye en ellos a las cinco especies conocidas de tremátodos con vesícula excretora tubular, testículos extracecales y vitelógenas intercecales.

Markell (1953) le da validez al género *Nagmia* y considera a *Petalodistomum pacificum* Caballero, 1945, como *Nagmia pacifica* (Caballero, 1945) Markell, 1953; este autor opina que *Nagmia pacifica*, muestra, con respecto a la forma de las vitelógenas, una intergradación entre la forma compacta de *Petalodistomum* y la esparcida y separada de *Nagmia yorkei* Nagaty, 1930, y sugiere además que otra diferencia entre *Nagmia* y *Petalodistomum* puede ser, en base de si están o no ramificados los conductos eferentes de los testículos, como se encuentran en *Probolitrema* Looss, 1902, y *Nagmia* Nagaty, 1930, pero no en *Petalodistomum* Johnston, 1914. Sogandares Bernal (1959) da validez al género *Nagmia* Nagaty, 1930 y considera a *Petalodistomum pacificum* Caba-

-OVER-

llero, 1945, como *Nagmia pacifica* (Caballero, 1945) Markell, 1953; hace notar que esta sepecie muestra una gran especificidad hospedatoria y que de varias especies de tiburones examinadas, solamente *Carcharhinus natator* estaba parasitada. Winter (1960) no reconoce al género *Nagmia* Nagaty, 1930, como distinto y rechaza la transferencia de Markell (1953) de *Petalodistomum pacificum* al género *Nagmia* y agrega a la lista de Pigulewsky la especie creada por Markell como *Petalodistomum (Petalodistomum) floridensis*.

En este trabajo considero a los géneros *Petalodistomum* y *Nagmia* como válidos, pero no a la especie *P. pacificum* Caballero, 1945, a la cual elevó al género nuevo *Winteria*, que considero dentro de la subfamilia Anaporrhutinae, como *Winteria pacifica* (Caballero, 1945) n. comb. por las siguientes razones: en primer lugar por la forma y número de testículos; segundo, por la forma y disposición de las glándulas vitelógenas; tercero, por la situación del poro genital, y cuarto, por ser parásito exclusivamente de la pared del cuerpo de tiburones.

Propongo para este nuevo género el nombre de *Winteria* gen. nov. dedicado con todo respeto a quien fuera destacado helmintólogo norteamericano e investigador visitante en este laboratorio hasta su muerte, Dr. Howard A. Winter.

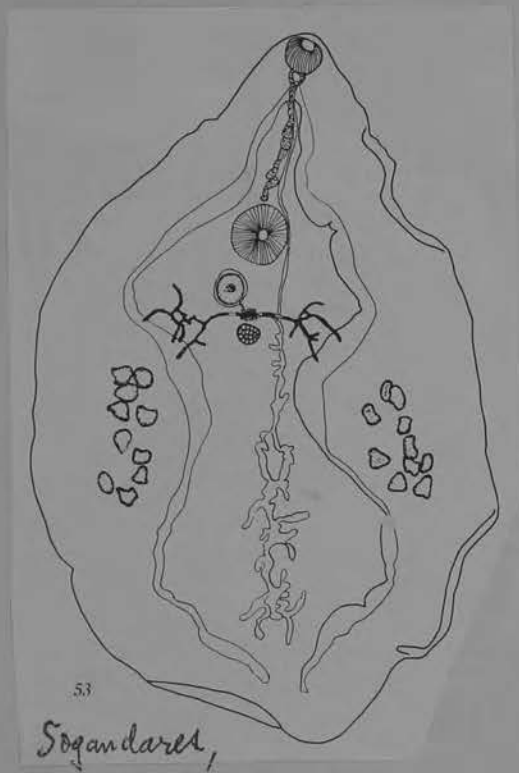
Doy a continuación una clave para la determinación de los géneros de la subfamilia Anaporrhutinae Looss, 1901.

1.	Parásitos de la cavidad del cuerpo de tiburones. Poro genital a nivel de la faringe 2	
	Parásitos de la cavidad del cuerpo de rayas y mantas. Poro genital a nivel o posterior a la bifurcación cecal 3	
2.	Vitelógenas compactas, formadas por numerosos folículos	*Pernagmia* Nagaty y Abdel Aal, 1961
	Vitelógenas dendriformes o digitiformes	*Winteria* gen. nov.
3.	Ciegos con numerosos divertículos 4	
	Ciegos sin divertículos 5	
4.	Testículos numerosos de tipo folicular	*Nagmia* Nagaty, 1930
	Testículos escasos en forma de masas lobadas	*Petalodistomum* Jonhston, 1914
5.	Testículos extracecales, cecales e intercecales, situados a nivel ecuatorial. Ciegos intestinales ligeramente ondulados	*Anaporrhutum* Ofenheim, 1900
	Testículos extracecales, situados desde el nivel ecuatorial, hasta el extremo posterior del cuerpo. Ciegos sinuosos ...	*Staphyllorchis* Travassos, 1920

~~PETALODISTOMUM~~ PACIFICUM (Caballero, 1945) Markell, 1953

Revised to Nagmia by Markell, 1953 J. Prentice

NAGMIA



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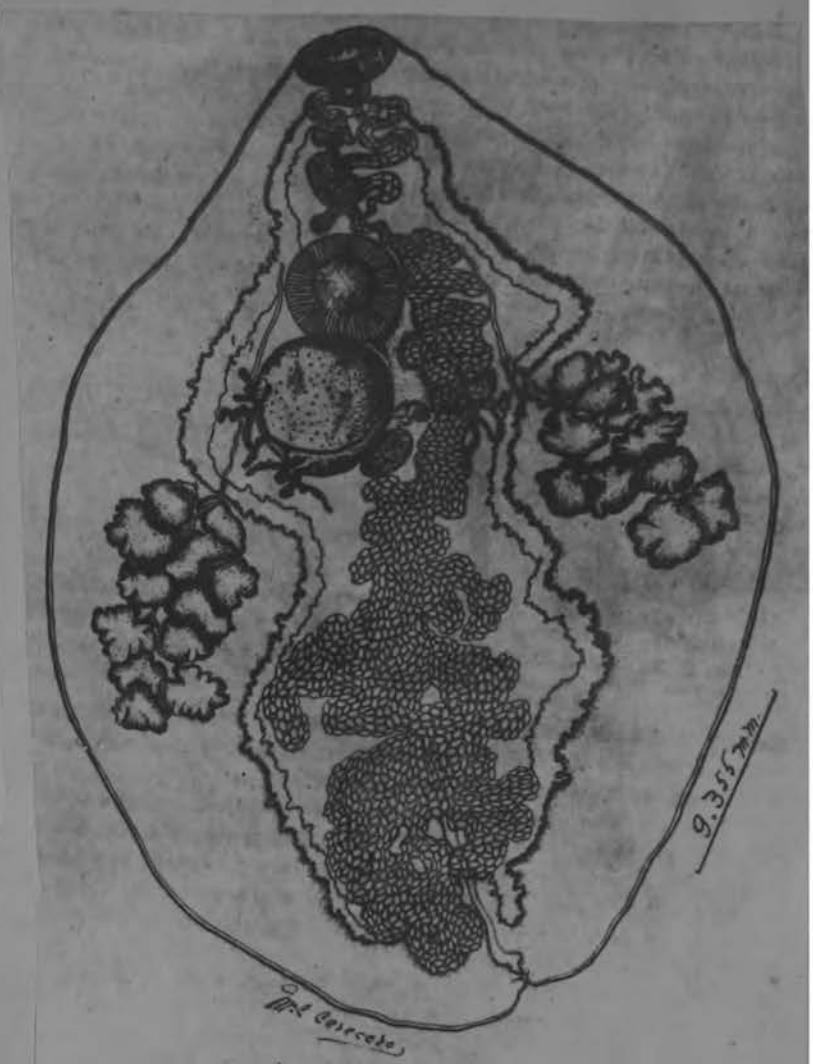
Sogandares, 1959



9.355 mm

M. C. Cerecero

Fig. 1. *Petalodistomum pacificum* n. sp. Vista ventral. Dibujo de una preparación total teñida con hemalumbre de Mayer. Dibujo de M. C. Cerecero.

P. *Family GORGODERIDAE Looss, 1901*

Nagmia pacifica (Caballero, 1945) Markell, 1953

Host.—*Carcharhinus natator* Meek & Hildebrand, black-tipped shark [new host record].

Location.—Coelom and intestinal mesenteries.

Locality.—Opposite mouth of Chiman River, near Pelado Island; Cocos Point, Isla del Rey and Playa Grande, San Jose Island, Archipielago de las Perlas; and Piñas Bay; all localities in the Gulf of Panama.

Discussion.—Caballero (1945) described *Petalodistomum pacificum* from 20 specimens taken from the coelom of an unidentified shark from the coast of Manzanillo, Mexico. Markell (1953) transferred *P. pacificum* to the genus *Nagmia* and the name became *Nagmia pacifica* (Caballero, 1945), Markell, 1953. Markell differentiated *Nagmia* from *Petalodistomum* Johnston, 1934 on the basis of whether or not there is branching of the efferent ducts of the testes such as is found in *Probolitrema* Looss, 1902 and in *Nagmia* Nagaty, 1930, but not in *Petalodistomum*. (Dollfus) 1937, Johnston (1934), Caballero (1945) and Caballero, et. al. (1956) considered *Nagmia* a synonym of *Petalodistomum*. When more species are known, the possible generic value of the vasa efferentia can be judged better.

N. pacifica is highly host-specific. In one night's collection several species of sharks over five feet in length were examined for this parasite. Only *Carcharhinus natator* harbored *N. pacifica*. Other similar collections in other parts of the Gulf of Panama and south west of Piñas Bay did not yield *N. pacifica* from any shark-like fish other than *Carcharhinus natator*. I have also studied three specimens of *Nagmia pacifica* collected by Miss Margarita Bravo Hollis at Punta Mita, Puerto Vallarta, Jalisco, Mexico, from an unidentified shark. Caballero's (1945) specimens are 9.355 to 14.647 mm. long. My Panama specimens were 6 to 15 mm long and one of Miss Bravo's specimens was 16.5 mm long. A specimen 6 mm long had eggs in the uterus. Caballero recorded a sucker ratio of 1:1.25 to 1.86 although his figure shows a sucker ratio of 1:1.12. Sucker ratios of specimens from my collection are from 1:1.09 to 2.34 (average about 1:1.44). Eggs of *N. pacificum* were described as 59 to 63 by 36 to 38 microns. Eggs from specimens in my collection measured 54 to 67 by 27 to 40 microns. Acetabulum position varies from anterior 1/4 to 1/3 of body, agreeing with Caballero's description "hacia delante del ecuador del cuerpo, por delante del ovario." (His plate shows the acetabulum in the anterior 1/4 body.) Recently Caballero, Barroeta, & Grocott (1956) reported *N. pacifica* from *Carcharias* in Panama. These authors apparently collected one specimen because they redescribed the species from one specimen and stated that the specimens from Mexico are larger in size than those from Panama and Alta California, U.S.A. As has been indicated above, *N. pacifica* appears to be host-specific to *Carcharhinus natator* in the Gulf of Panama, large numbers always being found in this shark. The record of a specimen of *N. pacifica* from *Carcharias* sp. in the Gulf of Panama may represent an accidental infection in this host or a host misidentification.

Sogandares, 1959

Winteria pacifica (Caballero, 1945) n. comb. LAMOTHE, 1969

Descripción: Quince especímenes fueron colectados de la cavidad celómica de un solo hospedador, son parásitos grandes, aplanados dorsoventralmente, que presentan un cuerpo en forma de hoja, aunque algunos tienden a la forma circular. Miden de 6.949 a 10.722 mm de largo por 5.940 a 8.500 mm de anchura máxima a nivel del ecuador del cuerpo. Cutícula lisa, delgada, sin espinas.

Ventosa oral terminal, más pequeña que el acetábulo, mide de 0.402 a 0.531 mm de largo por 0.483 a 0.644 mm de ancho. El acetábulo, situado por delante del ecuador del cuerpo, es casi circular, mide de 0.676 a 0.869 mm de largo por 0.676 a 0.933 mm de ancho.

La relación entre el acetábulo y la ventosa oral es de 1:1.68-1:1.63 x 1:1.3 — 1:1.4.

La boca casi circular, se abre dentro de la ventosa oral, se continúa con una faringe musculosa, de forma globulosa, mide de 0.128 a 0.246 mm de largo por 0.161 a 0.320 mm de ancho; el esófago pequeño, de paredes finas, casi siempre se encuentra doblado, mide de 0.085 a 0.161 mm de largo por 0.048 a 0.064 mm de ancho. La bifurcación cecal tiene lugar a una distancia de la extremidad anterior que varía de 0.579 a 0.885 mm; los ciegos intestinales se extienden casi hasta el extremo posterior del cuerpo, presentan en su trayecto numerosos y pequeños divertículos.

Los testículos formados por 10 a 12 folículos de cada lado, se encuentran situados ligeramente abajo del nivel ecuatorial del cuerpo, por fuera de los ciegos intestinales y casi siempre en una concavidad formada por éstos; los folículos de bordes lobulados miden de 0.225 a 0.354 mm de largo por 0.193 a 0.434 mm de ancho; los del lado izquierdo ocupan una área de 1.207 a 2.994 mm de largo por 1.127 a 1.384 mm de ancho, y los del lado derecho de 1.803 a 2.495 mm de largo por 0.966 a 1.481 mm de ancho.

De cada folículo parte un pequeño conducto eferente que desemboca a un conducto deferente; los conductos deferentes de cada lado ascienden oblicuos hasta desembocar separadamente a la vesícula seminal, que se inicia a la altura del borde anterior del acetábulo, sobre la línea media del cuerpo. La vesícula seminal es larga, sinuosa, mide de 1.125 a 2.334 mm de largo por 0.080 a 0.177 mm de ancho, y desemboca al poro genital que se abre ventralmente a nivel del ecua-

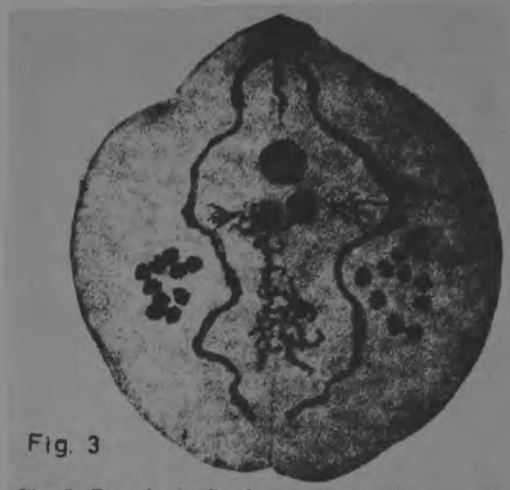


Fig. 3. Fotomicrografía de una preparación total de *Winteria pacifica* (Caballero, 1945) n. comb. Vista ventral.

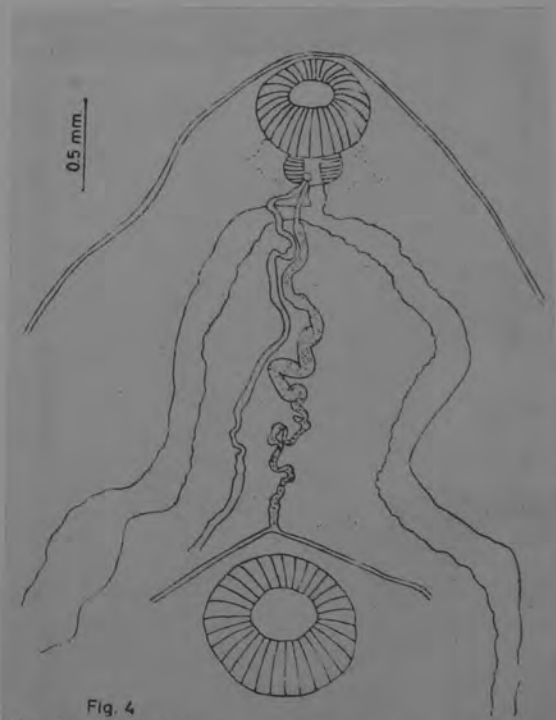


Fig. 4. Dibujo del extremo anterior de *Winteria pacifica* (Caballero, 1945) n. comb. Vista ventral.

-OVER-

dor de la faringe y a una distancia de la extremidad anterior que varía de 0.547 a 0.698 mm.

El ovario está situado sobre la línea media del cuerpo, es intercecal, postacetabular y pretesticular, pequeño, esférico o ligeramente ovoide, mide de 0.209 a 0.338 mm de largo por 0.177 a 0.418 mm de ancho; de su porción central parte un pequeño oviducto que presenta, en su trayecto, un esfínter, pequeño; recibe en ese lugar al conducto del receptáculo seminal y más adelante el viteloducto del receptáculo vitelino y juntos constituyen el ootipo, que se encuentra rodeado por la glándula de Mehlis; está muy bien desarrollada, mide de 0.144 a 0.161 mm de largo por 0.193 a 0.322 mm de ancho. No existe canal de Laurer. Del ootipo sale el útero que presenta dos ramas, una descendente sinuosa, con numerosas asas, que llega casi hasta el extremo posterior del cuerpo, pero sin sobrepasar el nivel de los ciegos intestinales, la otra porción ascendente presenta numerosas asas transversales y sinuosas, pasa por el lado derecho del ovario, sigue ascendiendo y, a la altura del borde anterior del acetábulo, se inicia el metratermo que mide de 0.354 a 1.851 mm de largo por 0.016 a 0.045 mm de ancho y termina en el poro genital, que se abre ventralmente.

El receptáculo seminal, más grande que el ovario, se encuentra situado casi siempre sobre la línea media del cuerpo, ligeramente cargado a la izquierda, es postacetabular, intercecal y preovárico, mide de 0.499 a 0.772 mm de largo por 0.434 a 0.724 mm de ancho; de su porción posterior sale un conducto pequeño y delgado que después de un corto recorrido se une al oviducto.

Las glándulas vitelógenas son foliculares, de aspecto dendriforme. Se encuentran situadas a cada lado del ovario, son intercecales y postacetabulares; los conductos vitelinos se unen casi sobre la línea media del cuerpo y a la derecha del ovario constituyen un pequeño receptáculo vitelino, de aspecto triangular, que desemboca por un fino conducto al ootipo.

Los huevos de cáscara amarillenta, operculados, miden de 0.041 a 0.052 mm de largo por 0.018 a 0.030 mm de ancho.

El aparato excretor está representado por la vesícula excretora, fina, tubular, que se extiende sobre la línea media del cuerpo desde el borde posterior del ovario, y termina en el poro excretor situado en el extremo posterior del cuerpo, donde se invagina un poco y constituye una escotadura media.

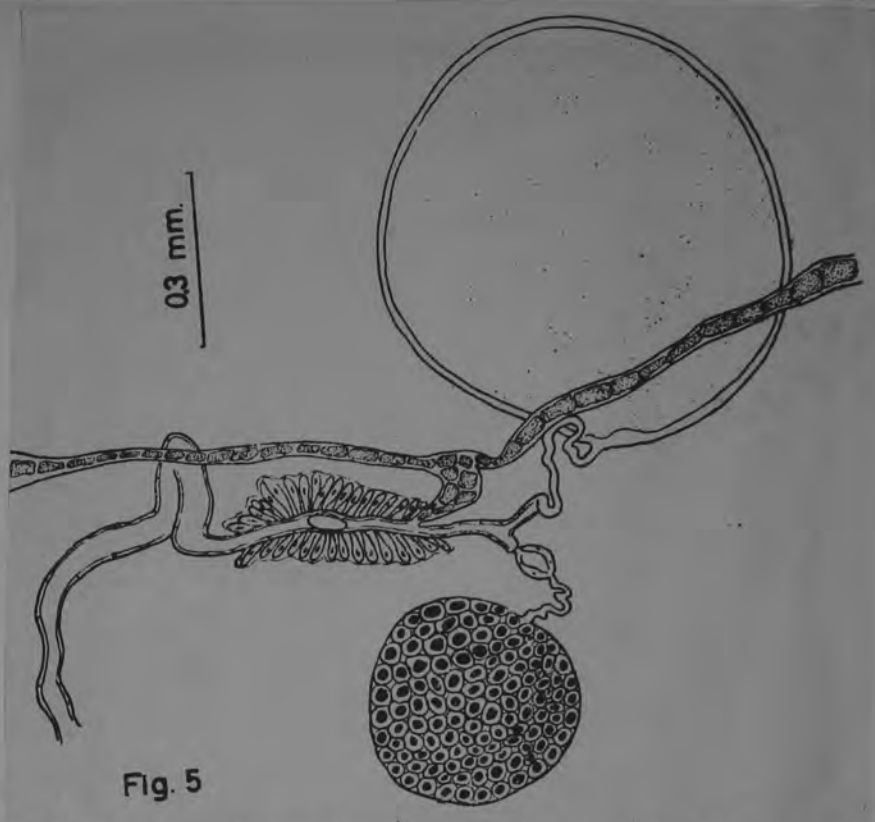


Fig. 5. Dibujo del complejo reproductor femenino de *Winteria pacifica* (Caballero, 1945) n. comb. Vista ventral.

Hospedador: *Carcharhinus limbatus.*
Hábitat: Celoma.
Localidad: San Blas, Nayarit, México.
Número de ejemplares: 15 en un hospedador.
Ejemplares: Depositados en la Colección Helmintológica del Instituto de Biología de la Universidad Nacional Autónoma de México con el número 223-17.

WINTERIA

Xystretinae n. subfam.

Subfamily diagnosis. — Gorgoderidae: Forebody tapered, hindbody rounded in outline. Pharynx absent. Ceca united posteriorly. Acetabulum at junction of two body regions. Testes, ovary and vitellaria close to-

gether in postacetabular intercecal area. Ovary anterolateral to either testis, vitellaria immediately postacetabular. Uterus intercecal. Excretory vesicle tubular. Parasitic in urinary bladder of marine fishes.

Xystretum Linton, 1910

Syn. *Macia* Travassos, 1920

Generic diagnosis. — Gorgoderidae: Forebody tapered anteriorly, hindbody oval in outline. Oral sucker terminal, no pharynx, esophagus short, ceca united posteriorly. Acetabulum medium-sized, pre-equatorial. Testes intercecal, practically symmetrical, in broadest part of hindbody. Seminal vesicle tubular. Ovary immediately in front of right testis. Vitellaria between acetabulum and testes, each divided into digitiform lobes. Uterus confined to intercecal area of hindbody. Genital pore postbifurcal. Excretory vesicle tubular. Parasitic in urinary bladder of marine fishes.

Genotype: *X. solidum* Linton, 1910, syn. *Catoptroides aluterae* MacCallum, 1917, *C. magnum* MacCallum, 1917, *X. papillosum* Linton, 1910, (Pl. 7, Fig. 82), in *Balistes carolinensis;* Bermuda. Also in *Lactophrys triqueter;* Florida.

Other species:

X. caballeroi Bravo, 1953, in *Pachynathus capistratus;* Jalisco.

X. pulchrum (Travassos, 1920) (syn. *Macia p.* T.) in *Spheroides testudineus;* Brazil. Also in *S. splengeri;* Florida; *Balistes capistratus;* Honolulu.

130. XYSTRETRUM SOLIDUM Linton, 1910

SYNONYMS: *Catoptroides magnum* MacCallum, 1917;* *Catoptroides aluterae* MacCallum, 1917;* *Xystretrum papillosum* Linton, 1910;* "Undetermined trematode" from *Balistes carolinensis* of Linton, 1907, p. 119.

HOSTS: *Balistes capriscus* Gmelin (=*Balistes carolinensis*): leatherjacket, triggerfish; in 1 of 3 hosts examined; 2 specimens. *Lactophrys triqueter* (Linn.), trunkfish; in 1 of 5 hosts examined; specimens very numerous (over 100).

LOCATION: Urinary bladder.

Discussion: If the above synonymy is correct, this species was first collected from *Balistes capriscus* in Bermuda by Linton; later from the same host from Key West by MacCallum; from *Alutera schoepfii*, the orange filefish, from Key West by MacCallum.

Linton's original description from a single, somewhat curled, specimen is not very complete. Were it not from the same host as later collections it might be considered a distinct species on the basis of sucker ratio and shape of vitellaria. I believe his specimen was not favorable to show the normal or at least the common condition of those organs.

MacCallum (1917) considered *Xystretrum* a synonym of Catoptroides and distinguished both of his species from *X. papillosum* because they lacked spines and the ventral transverse striae. He gave no figure of "*C. aluterae*" which he distinguished from "*C. magnum*" because of its smaller size and "more delicate" structure.

Through the kindness of Dr. E. W. Price and the National Museum, MacCallum's slides of these species were made available for study. There was some error in the labeling of the three slides but since only one species seems to be involved the point is not important. One slide labeled "*Distomum-Xystretrum papillosum*—urinary bladder-*Alutera schoepfii*—filefish," has four

* New synonymy.

specimens, three of them about 6 mm in length, the other about 4 mm. It is not certain that the slide labeled *Xystretrum papillosum* from *Alutera schoepfii* is the same material on which MacCallum based his species. The specimens measure 4 to 6 mm in length or larger rather than smaller than the specimens from *Balistes*. Size can apparently be ruled out as a distinction between the species since MacCallum's specimens from *Balistes* ranged from 3.5 to 5.4 mm, the published size of the species from *Alutera* was 3.4 mm and actual specimens measure above that figure. Two other slides were labeled "*Catoptroides balistes*" (a name apparently not published) from *Balistes carolinensis*, evidently MacCallum's *Catoptroides magnum;* the 15 specimens measured 3.5 to 5 mm in length.

Traces of the hair-like spines and of the ventral striae could be seen on some of MacCallum's specimens from both hosts. These peculiar, fine spines can be easily lost and the striae can be made invisible by too much pressure and over-clearing. My conclusion is that MacCallum was dealing with a single species of the genus *Xystretrum*. *Xystretrum* is related to *Catoptroides* but is characterized by: (1) continuous intestinal ceca; (2) hair-like spines; and (3) transverse, ventral striae.

It is difficult to distinguish species of *Xystretrum* because of extreme variation especially in body size, egg size, and shape of vitellaria. The thin-shelled eggs are frequently malformed in my specimens. Measurements of eggs in MacCallum's largest specimen from *Alutera* were (in microns): 46 by 27; 44 by 29; 48 by 29; 39 by 22; and 29 by 19! In another specimen the eggs were consistently 31 to 34 by 19 to 20 μ. Eggs in specimens from *Balistes* were 41 to 42 by 24 to 27 μ.

My two specimens from *Balistes* were somewhat larger (2.993 to 3.112 mm) than those from *Lactophrys* (about 1.825 to 2.628 mm) and had a much more extensive uterus. But the small size and reduced uterus of the latter might well be due to the extremely heavy infection. Linton's single specimen from *Lactophrys* was 3.5 mm. long with well developed uterus. Sucker ratio as measured from favorable specimens might be a character of specific value in this genus. This ratio is 1:1.5 in both my specimens from *Balistes* and 1:1.5 to 1.86 (usually 1.55 to 1.76) in 14 specimens from *Lactophrys*. My specimens from *Balistes* had 49 to 51 ventral striae, while the smaller specimens from *Lactophrys* had 38 to 42 striae.

Xystretum solidum Linton, 1910 MacCallum, 1917

syn *Catoptroides magnum*, sp nov.

(Fig. 31)

Family—*Gorgoderidae*, Lss.
Genus—*Phyllodistomum*, Ben.

Host—*Balistes carolinensis*.
Habitat—Urinary bladder of marine fishes.
Locality—Aquarium at New York, from Key West, Florida.

Linton while working at the Dry Tortugas found a worm in a *Lactophrys triqueter*, trunk fish, which he described as having a spiny skin and spines in the suckers. He states also that the surface of the abdominal skin is ridged with transverse striae giving it the appearance of a rasp, and upon these characteristics he established a new genus *Xystretrum* with the species papillosum. He also described finding in a fish at Bermuda another single worm, which belonged, as he thought, to this genus, but inasmuch as the vitellaria were of a more compact character he regarded it as a different species and named it X. solidum. It had the same transverse striae on the abdominal surface and spines throughout. I too have met with this genus on one or two occasions. On May 31, 1915, there were found in the urinary bladder of *Balistes carolinensis*, trigger fish, one of these worms; and on April 13, 1916, in the urinary bladder of another *B. carolinensis* fourteen similar worms which do not answer the description of Linton's *Xystretrum papillosum* since they are larger, and have an entirely smooth thick spineless skin throughout.

The anterior sucker is subterminal and the mouth is near the centre of this. The pharynx, if present, is not apparent. The oesophagus is rather short and divides into the ceca almost at once. These are large and pass in a continuous circle about the posterior end of the worm. The genital pore is placed well up in the angle of the divided ceca, and here the cirrus may often be seen protruded and about .60 mm. in length. The ventral sucker is large, being about twice the size of the oral sucker. Almost immediately posterior to the ventral sucker are the vitellaria, small and irregularly finger shaped and clustered in two masses. Behind these are the two testes, and between the latter and the two masses of vitellaria is the genital junction, and also between the vitelline masses is the ootype, the eggs after passing through this pass posteriorly through the coils of the uterus and finally under the left edge of the ventral sucker on its way to the genital pore, which is central and anterior to the acetabulum. The ovary is small and situated anterior to the right testis. The testes are much larger than the ovary, and each sends its efferent duct forward on each side of the ventral sucker to join anterior to it before proceeding to the genital pore, and before terminating in the vas deferens and the cirrus. The uterus fills the posterior part of the body, and the eggs are relatively small, but numerous. On account of its relatively large size I would suggest the name *Catroptoides magnum*. For the purpose of classification it may be said to be of the shape of a flattened Flemish flask or tennis racquet, almost circular body and an elongated neck. The ventral sucker, which is large, and situated at the junction of the neck with the body, forms a prominent feature, skin thick and smooth. No spines anywhere, ceca continuous.

Measurements of *Catoptroides magnum*

Whole length of worm	5.00 mm.
Width of body	3.40 mm.
Length of body alone	3.40 mm.
Length of neck	1.60 mm.
Width of neck at base	1.00 mm.
Width of mouth or oral sucker	.40 mm.
Diameter of ventral sucker	1.00 mm.
Length of protruded cirrus	.60 mm.

On referring to Prof. T. Odhner's Report of the Swedish Zoological Expedition to Egypt and the White Nile in 1901, I find that there were found a number of worms in the urinary bladder of fishes for instance *Bagrus bayad* and *B. docmac* and also in *Malapterurus electricus* (Omdurman), which were considered new and have been recorded under the genus name *Catoptroides*, *Odhn*. These worms undoubtedly belong to the same genus as those which Dr. Linton has called *Xystretrum*. They are undoubtedly of a different species, but the genus is the same. One, Odhner names *Catoptroides spatula* and another *C. Spatuloeformis*, and claims for them that they form a new genus.

As Linton's paper is dated 1910, and Odhner's 1902 by the rule of priority the genus should be *Catoptroides* instead of *Xystretrum*.

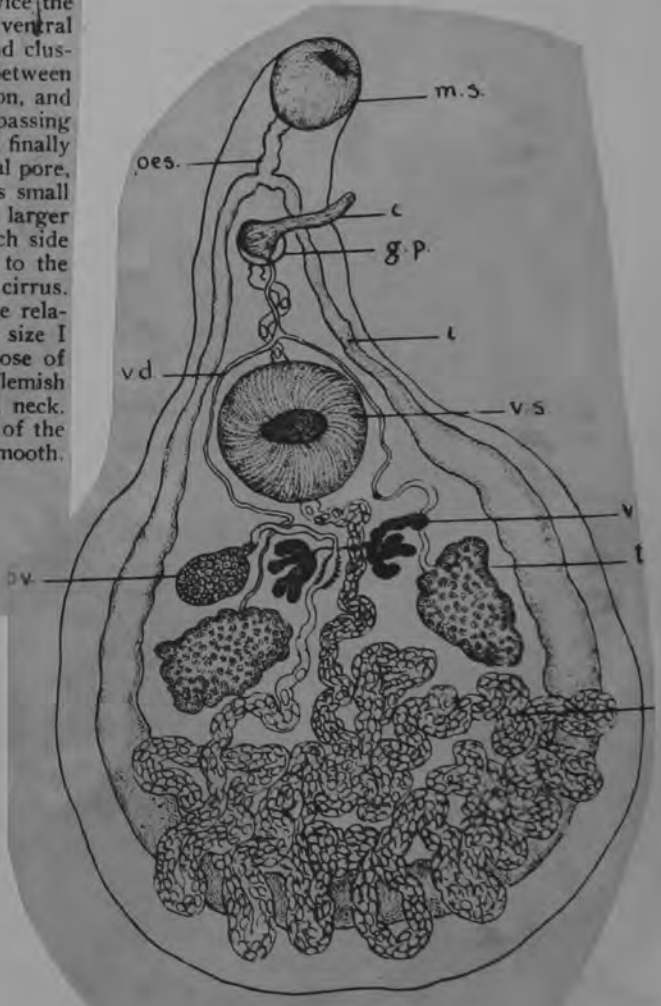


FIG. 31. *CATOPTROIDES MAGNUM.*

Xystretum solidum Linton, 1910 MacCallum, 1917

SYN. *Catoptroides aiuterae*, sp. nov.

Host—*Alutera schoepfii*, t. h.
Habitat—Urinary bladder.
Locality—New York Aquarium, from Key West, Fla.

On May 4, 1915, there were found in the urinary bladder of an *Alutera schoepfii* (Orange Filefish), forty-six small worms, which evidently belong to the genus *Catoptroides, Odhn.* They were very active when first liberated, but soon lost their vitality when placed in sea water. This worm is much smaller and more delicate in structure than *C. magnum*, and, like it, its skin is free from spines as well as the transverse striae which Linton credits *Xystretrum papillosum* with. When a number are mounted on a slide together it can be easily seen that the intestine is continuous around the posterior end of the body. It is also not an unusual thing to see the thin edge of the body folded under in some specimens, but this is not at all constant. On the whole, from these differences, it cannot be said to be the same as *C. magnum* or *Xystretrum papillosum*, and consequently will have to be called a new species.

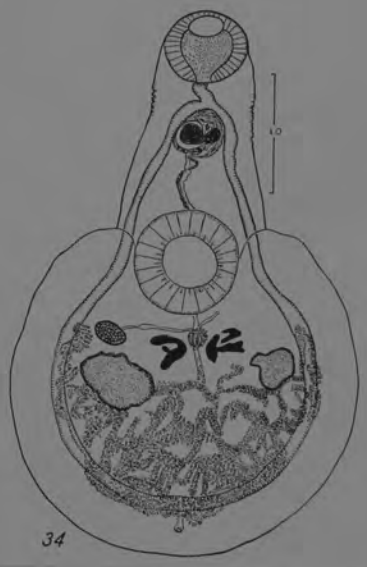
Measurements of *Catoptroides a'uterae*

Length	3.40 mm.
Width	2.60 mm.
Length of neck	1.20 mm.
Width of neck at base	.80 mm.
Width of mouth sucker	.20 mm.
Length of protruded cirrus	.40 mm.

From Siddiqi & Cable, 1960:

Xystretrum solidum Linton, 1910 (Figure 34)

Synonyms:
Catoptroides aluterae MacCallum, 1919
Catoptroides magnus MacCallum, 1917
Xystretrum papillosum Linton, 1910
Macia pulchra Travassos, 1921
Xystretrum pulchrum (Travassos) Manter, 1947 new syn.
Host: Lactophrys bicaudalis
Site: urinary bladder
Locality: Cabo Rojo, P. R.
Three species of Xystretrum, namely, X. solidum, X. pulchrum, and X. caballeroi have been described. Manter (1947) remarked on the difficulty of distinguishing the first 2; the present specimen combines the characters that have been used to separate them. For that reason X. pulchrum is here reduced to synonymy with X. solidum.



Xystretrum solidum Linton, 1910
Synonyms: Catoptroides aluterae MacCallum, 1917; *Catoptroides magnum* MacCallum, 1917; *Macia pulchra* Travassos, 1921; *Xystretrum pulchrum* (Travassos) Manter, 1947; *Xystretrum papillosum* Linton, 1910.
*Hosts: *Balistes vetula* (J); **Cantherines pullus* (J); **Canthigaster rostratus* (C); **Lactophrys tricornis* (J); *Spheroides testudineus* (J). JAMAICA, CURAÇAO
Site: urinary bladder and kidney ducts.
The effect of crowding on the size of this species, mentioned by Manter (1947), was shown by the more than 100 specimens with which the kidney ducts and bladder of one *Canthigaster rostratus* were literally stuffed.

FROM NAHHAS AND CABLE (1964)

FAMILY GORGODERIDAE Looss, 1901
Xystretrum solidum Linton, 1910
"Trematode allied with *Phyllodistomum*" of Linton, 1907.
Xystretrum papillosum Linton, 1910.
Catoptroides aluterae MacCallum, 1917.
Catoptroides magnum MacCallum, 1917.
Macia pulchra Travassos, 1921.
from; Overstreet, 1969

(over)

Fig. 7. Genital papilla of *X. solidum* Linton, 1910 from *Lactophrys triqueter* (Linn.), Dry Tortugas, Florida.

Considering the number of investigators who have reported and figured *X. solidum* (including myself), it is surprising that no one has correctly noted the character of the large "cirrus" often protruding finger-like from the genital pore. This structure is actually a large papilla arising from the base of the genital atrium. It contains separate male and female ducts which open together at the tip of the lobe-like papilla (Fig. 7). Thus, it differs from the papilla of *X. caballeroi* in not containing a *ductus hermaphroditicus*.

MANTER, 1972

Xystretum abalistis Parukhin, 1964

from Helm. Abstracts:

4682—PARUKHIN, A. M., 1964. [A new trematode of the family Gorgoderidae Looss, 1901.] *Helminthologia*, **5** (1/4), 123–124. [In Russian: English & German summaries p. 124.]

Xystretum abalisti n.sp. (one specimen) from the urinary bladder of *Abalistes stellaris* in the Gulf of Tonkin is described and figured. The absence of body spines and transverse ridging distinguishes it from *X. solidum* and the size of the body (which is pear-shaped and 5·2 mm. long), the lobed vitellaria and the size of the gonads and eggs distinguish it from *X. pulchrum*. G.I.P.

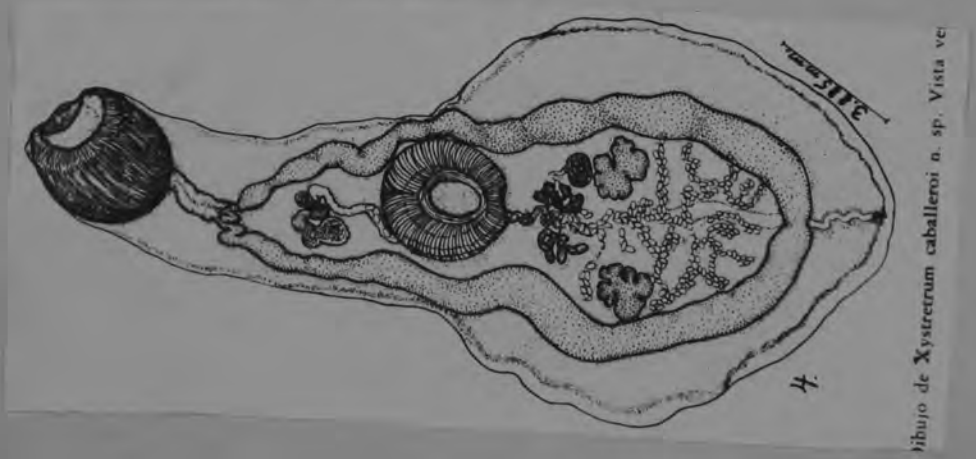
Xystretrum caballeroi Bravo, 1954

Description based on 2 specimens from the urinary bladder of Pachynathus capistratus (Shaw): total length 3.325 - 3.885 mm. by 0.785 mm. wide in the preacetabular zone and 1.627 - 1.872 mm. in the postacetabular zone; cuticle thin and smooth, with spinulose papillae surrounding the ventral sucker only; faint transverse striations noticeable in the cuticle of the central region of the postacetabular zone; margins, especially in the postacetabular zone, tending to roll inward. Oral sucker terminal, 0.577-0.630mm. long by 0.487 - 0.560 mm. wide; acetabulum situated between the termination of the narrow zone and the part where the body begins to enlarge, 0.525 - 0.542 mm. long by 0.542 - 0.560 mm. wide; sucker ratio 1:0.86 - 1:0.94 (longitudinal diameters) and 1:1 - 1:1.1 (transverse diameters) taking the unit of the ventral sucker as 1.

Balistidae

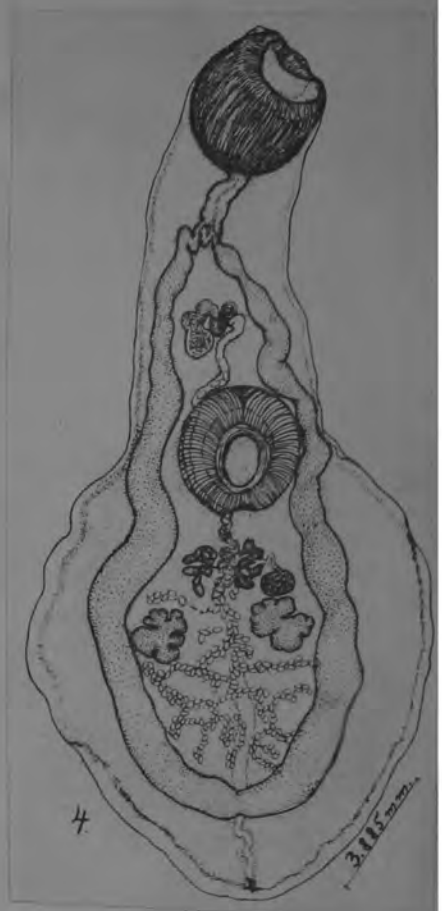
Mouth subterminal, 0.068 - 0.080 mm. long by 0.240 - 0.300 mm. wide; the esophagus sinuous with thin walls, 0.262 - 0.350 mm. long by 0.087 - 0.140 mm. wide; ceca joined posteriorly 0.315 - 0.437 mm. away from the posterior extremity. Testes postacetabular, intercecal, postovarian, symmetrical, separated by the uterus; borders crenulated; right testis maximum diameter 0.175 - 0.262 mm., width 0.122 - 0.210 mm.; left testis maximum diameter 0.175 - 0.327 mm., smaller 0.192 - 0.210 mm.; the major diameter corresponds in general to the antero-posterior diameter but in this case it becomes more spherical; cirrus pouch 0.272 - 0.360 mm. long by 0.148 - 0.160 mm. wide; seminal vesicle 0.140 - 0.168 mm. long by 0.080 - 0.132 mm. wide; the prostate is represented by a mass of cells situated between the seminal vesicle and the cirrus which is badly defined though present; ovary to the right, intercecal, postacetabular, 0.087 - 0.105 mm. long by 0.140 mm. wide; oviduct parts from the anterior border of the ovary to open in Mehlis' gland; seminal receptacle absent. Vitelline glands are found in posterior border of acetabulum next to Mehlis' gland; right one shows 5 digitiform lobes; left one shows 4; right one 0.114 - 0.192 mm. long by 0.105 - 0.122 mm. wide; left one 0.140 - 0.210 mm. long by 0.105 - 0.140 mm. wide. Mehlis' gland 0.105 - 0.140 mm. long by 0.070 - 0.087 mm. wide; uterine branches principally intercecal in posttesticular zone, sometimes touching internal border of cecum; ascending branch passes by Mehlis' gland, borders the acetabulum and emerges in the genital pore; genital pore found in medial ventral line between cecal bifurcation and acetabulum; eggs 28 - 44 u long (majority 32 u) by 18 - 26 u wide (majority 20 u); excretory pore 0.140 - 0.157 mm. from posterior end; excretory vesicle ascends in form of thin tube but is lost upon reaching uterine branches.

Collected at Puerto Vallarta, Jalisco



ibujo de Xystretrum caballeroi n. sp. Vista ve

Xystretrum caballeroi ~~n. sp.~~ BRAVO-HOLLIS, 1954



Unicamente dos ejemplares de esta especie se localizaron en la vejiga urinaria de **Pachynathus capistratus** (Shaw). Miden de longitud total de 3.325 a 3.885 mm. por 0.785 mm. de ancho en la zona preacetabular y de 1.627 a 1.872 mm. en la zona postacetabular; la cutícula es delgada; sólo se distinguen las papilas espiniformes bordeando la ventosa oral, en las demás partes es lisa; en la región central de la zona postacetabular se notan en la cutícula débiles estrías transversales. Los bordes tienden a enrollarse sobre sí mismos especialmente en la zona postacetabular.

La ventosa oral es terminal, de 0.577 a 0.630 mm. de diámetro longitudinal por de 0.487 a 0.560 mm. de diámetro transversal; el acetábulo está situado entre la terminación de la zona angosta y la parte donde se empieza a ensanchar el cuerpo, y mide de diámetro longitudinal de 0.525 a 0.542 mm., de diámetro transversal de 0.542 a 0.560 mm.; la relación entre los diámetros de las dos ventosas es de 1:0.86 a 1:0.94 la del diámetro longitudinal, y la del transversal de 1:1 a 1:1.1, tomando como unidad la ventosa oral.

La boca es subterminal, y mide de diámetro ántero-posterior de 0.068 a 0.080 mm., de diámetro transversal de 0.240 a 0.300 mm.; el esófago es sinuoso, de delgadas paredes, y tiene de largo de 0.262 a 0.350 mm. por de 0.087 a 0.140 mm.; los ciegos están fusionados en su extremo posterior y distan de este extremo de 0.315 a 0.437 mm. Los testículos ocupan la zona postacetabular intercecal, son posteriores al ovario y uno al lado del otro, separados entre sí por las asas uterinas; sus bordes son muy sinuosos; el derecho tiene de diámetro mayor de 0.175 a 0.262 mm., de ancho de 0.122 a 0.210 mm.; el izquierdo mide de diámetro mayor de 0.175 a 0.327 mm., de diámetro menor de 0.192 a 0.210 mm.; el diámetro mayor corresponde en lo general al diámetro anteroposterior, pero en este caso se hace más bien oblicuo; la bolsa del cirro mide de 0.272 a 0.360 mm. de largo por de 0.148 a 0.160 mm. de ancho; contiene una vesícula seminal de 0.140 a 0.168 mm. de largo por de 0.080 a 0.132 mm. de ancho; la próstata está representada por un conjunto de células situadas entre la vesícula seminal y el cirro, el cual está mal definido aunque presente; el ovario se encuentra hacia el lado derecho intercecal, es posterior al acetábulo, y mide de largo de 0.087 a 0.105 mm. por 0.140 mm. de ancho; el oviducto parte del borde nterior del ovario para desembocar en la glándula de Mehlis; receptáculo eminal ausente; las vitelógenas se encuentran en el borde posterior del cetábulo, a los lados de la glándula de Mehlis; la derecha presenta cinco obulaciones digitiformes y cuatro la izquierda; la derecha abarca una exensión de 0.114 a 0.192 mm. de largo por de 0.105 a 0.122 mm. de ancho; a izquierda de 0.140 a 0.210 mm. de largo por de 0.105 a 0.140 mm. de ncho; la glándula de Mehlis tiene de largo de 0.105 a 0.140 mm. por de 0.070 a 0.087 mm. de ancho. Las asas uterinas ocupan fundamentalmente a zona intercecal postesticular, tocando algunas el borde interno de los iegos; el asa ascendente pasa por la glándula de Mehlis, bordea el acetábulo y desemboca en el poro genital que se encuentra en la línea media ventral entre la bifurcación cecal y el acetábulo; los huevos miden de 0.028 a 0.044 mm. de largo como medidas extremas, pero la mayoría 0.032 mm.; el ancho es de 0.018 a 0.026 mm., en la mayoría de 0.020. El poro excretor dista del extremo posterior de 0.140 a 0.157 mm.; la vesícula excretora sube en forma de tubo delgado, pero se pierde al llegar a las asas uterinas.

- OVER -

Hospedador: **Pachynathus capistratus** (Shaw).

Localización: Vejiga urinaria.

Distribución geográfica: Puerto Vallarta, Jalisco.

Tipo: Colección helmintológica del Instituto de Biología. No. 25-21.

Discusión.—Nuestra especie fué comparada con las especies hasta ahora conocidas: **Xystretrum solidum** Linton, 1910, y **Xystretrum pulchrum** (Travassos, 1925), diferenciándose de ambas, fundamentalmente, en la relación del tamaño de las ventosas; en nuestros ejemplares es más grande la ventosa oral que el acetábulo, en tanto que en las otras especies y sus sinónimos siempre la ventosa es más pequeña que el acetábulo. Este es el carácter que se ha tomado como fundamental para la clasificación de las especies de **Xystretrum**, y que nos ha llevado a considerar la nuestra como especie nueva. Además, las especies ya conocidas se han encontrado parasitando a peces marinos del Atlántico Norte y Sur, mientras que la nueva especie que se instituye en esta contribución, parasita a peces marinos del Pacífico del Norte, de donde hasta la fecha no había sido mencionada ninguna especie.

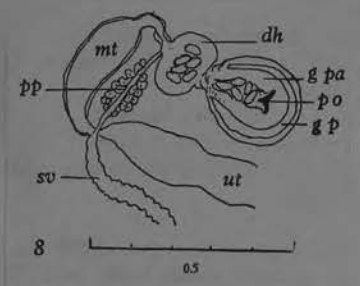


Fig. 8. Ventral view of terminal genital ducts of *X. caballeroi* Bravo-Hollis, 1954, from *Pachynathus capistratus* (Shaw), Mexican Pacific.

Xystretrum caballeroi Bravo-Hollis, 1954, was distinguished from *X. solidum* because the oral sucker was slightly larger than the acetabulum rather than *vice versa*. However, the figure of *X. caballeroi* has suckers of equal width, and two specimens in my collection have acetabula slightly wider than the oral sucker. *Xystretrum caballeroi* does differ distinctly from *X. solidum* in the character of the terminal ducts. The metraterm and the male duct unite at the base of a *ductus hermaphroditicus* which penetrates into the rather small genital papilla (Fig. 8). In my specimen, the seminal vesicle is a rather narrow tube.

MANTER, 1972

Family GORGODERIDAE (Looss, 1899) Looss, 1901

Subfamily XYSTRETRINAE (Yamaguti, 1958) spelling emended

53. *Xystretrum hawaiiense* ~~n. sp.~~ Yamaguti, 1970

(Fig. 52)

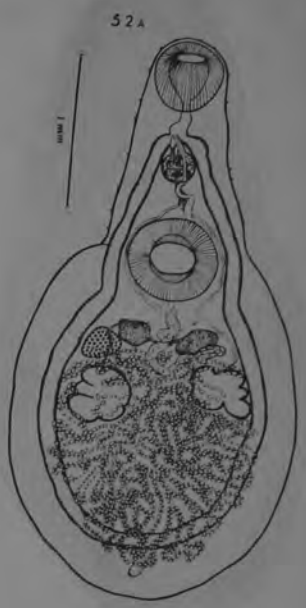
HABITAT: Urinary bladder of *Balistes capistratus* (type host), *B. bursa*, *B. fuscus*, *Rhinecanthus rectangulus*, and *Amanses pardalis*; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63574.

DESCRIPTION (based on 45 whole mounts, of which 33 are from the type host): Body flattened retort-shaped, 1.9-4.3 mm long, clearly bipartite with acetablum at junction of two body regions; hindbody circular, 0.95-2.4 mm in diameter. Cuticle thin, scattered with minute papillae, especially on forebody. Oral sucker ventroterminal, 0.24-0.5 X 0.23-0.5 mm; esophagus wide, 0.1-0.2 mm long; ceca simple, united posteriorly just in front of excretory pore. Acetabulum 0.3-0.65 mm in diameter, at junction of anterior with middle third of body. Sucker ratio approximately 1 : 1.2-1.3.

Testes rounded, irregularly indented, 0.17-0.55 X 0.2-0.67 mm, situated symmetrically, one on each side, medial to intestine at posterior end of middle third of body. Pseudohermaphroditic pouch rounded, muscular, 0.1-0.23 mm in diameter, just postbifurcal, containing saccular seminal vesicle, well differentiated prostatic complex, ciliated ejaculatory duct, and ciliated metraterm; these two ducts opening close together at apex of genital cone. Genital cone, when protruded, truncate at tip, 0.08-0.24 mm long, 0.07-0.12 mm wide at base.

Ovary subglobular, entire, rarely indented, 0.13-0.35 X 0.15-0.36 mm, situated just in front of right or left testis. No seminal receptacle. Laurer's canal opening dorsally in left submedian line between acetabulum and left vitelline gland in the type. Vitellaria divided into two compact lobes, each of which may be slightly indented, but never as deeply lobed in full-grown specimens as in other known members of the genus, situated at about equatorial level. Uterus forming close transverse or radial loops and occupying entire posttesticular intercecal area, sending a transverse loop in between ovary and right testis and another in between left vitelline gland and left testis, finally ascending in median field between two lobes of vitellaria and dorsal to acetabulum; metraterm lined with cilia, penetrating pseudohermaphroditic pouch at its base and running straight forward through genital cone to open alongside ejaculatory duct at apex of cone. Eggs elliptical, bean-shaped in profile, embryonated, 44-61 X 20-28 μ; small elongate oval eggs, 25-30 μ long by 14-18 μ wide, are intermingled with normal embryonated eggs. Excretory pore middorsal, near posterior extremity; vesicle tubular, bifurcating between two testes.



DISCUSSION: This species differs from any known members of the genus in the vitelline gland being compact and never deeply lobed, even when full-grown. Bravo-Hollis (1954) reported *Xystretrum caballeroi* from *Balistes capistratus* from Puerto Vallarta, Jalisco. In that species, however, the oral sucker is larger, or nearly as large, as the acetabulum. We have been unable to find *Xystretrum pulchrum* (Travassos, 1921) which was reported by Hanson (1955) from *Balistes capistratus* of Hawaii.

Manter, 1972

Xystretrum moretonense ~~sp. nov.~~
(Figs. 1-3)

Host: *Triacanthus biaculeatus* (Bloch); Triacanthidae; black-finned three spine.
Locality: Moreton Bay region, Queensland, Australia.
Location: Urinary bladder.
Number: 8 in 2 of 5 hosts.
Holotype: USNM Helminth. Coll. No. 71849.

Description: Body flask-shaped, with narrow forebody and wide, rounded hindbody; mostly smooth except for fine, pointed papillae around apertures of suckers; fine papillae also present on folds of cuticula; perhaps lost elsewhere. Transverse striae of hindbody inconspicuous, well separated, about 8 or 10 visible in mounted specimens, about 30 in living specimens. Length 1.995 to 3.800 mm; greatest width 1.045 to 1.995 mm. Forebody 0.722 to 1.425 mm long, or from about 1/3 to 1/2 body length. Oral sucker 335 to 536 wide; acetabulum 395 to 657 wide; sucker width ratio 1:1.08 to 1.22. Esophagus 100 to 256 long, muscular. Bifurcation nearer to oral sucker than to acetabulum. Ceca forming cyclocoel; postcecal space 201 to 523 long.

Genital pore median, slightly posterior to intestinal bifurcation, a thick-walled transverse slit. Testes symmetrical, well separated but between ceca, near middle of hindbody; they are unlobed, slightly lobed (crenulated), or, rarely, deeply lobed. Seminal vesicle a bent tube, with anterior half saccular, entering side of prostatic vesicle about ¼ from one side, and posterior half more slender and provided with a few gland cells. Prostatic vesicle saccular to ovoid, ventral to seminal vesicle; it is smaller or larger than saccular portion of seminal vesicle, and lined with nucleated cells. Pars prostatica a narrow tube ventral to prostatic vesicle. Cirrus short, thick-walled. Genital papilla absent or small.

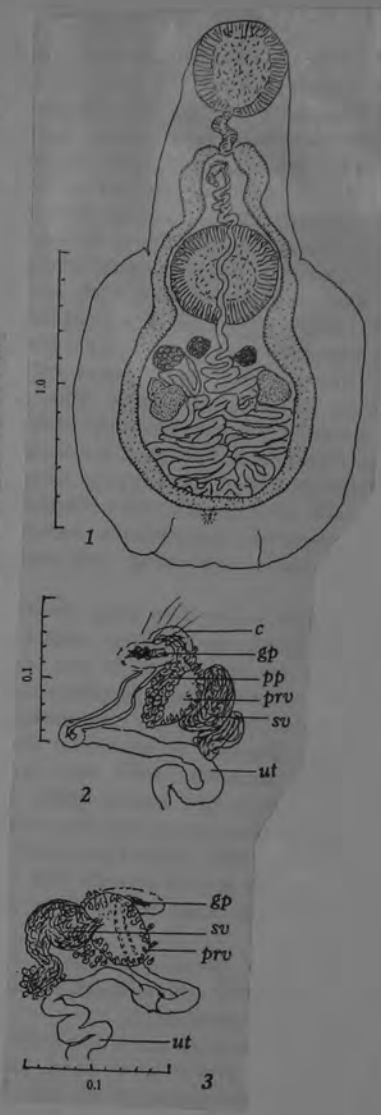


Fig. 1. *Xystretrum moretonense*. Holotype. Dorsal view. Fig. 2. *X. moretonense*. Holotype. Ventral view of terminal genital ducts. Fig. 3. Same. Dorsal view.

(over)

Ovary ovoid, unlobed, anterior to and slightly separated from left (or in one case, right) testis. Vitellaria symmetrical, at or near level of ovary, and median to ovary; they are ovoid or, rarely, deeply lobed. Uterus in narrow coils extending posteriorly, then anteriorly, sometimes overlapping ceca slightly but not extending lateral to ceca; it has very short loops or coils in forebody, becomes a slender, muscular metraterm along side of prostatic vesicle, and opens into a shallow genital atrium. Eggs thin-shelled, often abnormal; mature eggs 32 to 38 by 18 to 22.

Excretory pore dorsal, immediately posterior to cyclocoel; vesicle not observed.

The name *moretonense* is for the locality, Moreton Bay.

Discussion: Most species named in the genus *Xystretrum* Linton, 1910, have been considered synonyms of *X. solidum* Linton, 1910. Such synonyms are *X. pulchrum* (Travassos, 1921) Manter, 1947; *X. papillosum* Linton, 1910; *Catoptroides aluterae* MacCallum, 1919; and *C. magnus* MacCallum, 1917. *Xystretrum caballeroi* Bravo-Hollis, 1954, was distinguished from *X. solidum* because the oral sucker was slightly larger than the acetabulum rather than *vice versa*. However, the figure of *X. caballeroi* has suckers of equal width, and two specimens in my collection have acetabula slightly wider than the oral sucker. *Xystretrum caballeroi* does differ distinctly from *X. solidum* in the character of the terminal ducts. The metraterm and the male duct unite at the base of a *ductus hermaphroditicus* which penetrates into the rather small genital papilla (Fig. 8). In my specimen, the seminal vesicle is a rather narrow tube.

Considering the number of investigators who have reported and figured *X. solidum* (including myself), it is surprising that no one has correctly noted the character of the large "cirrus" often protruding finger-like from the genital pore. This structure is actually a large papilla arising from the base of the genital atrium. It contains separate male and female ducts which open together at the tip of the lobe-like papilla (Fig. 7). Thus, it differs from the papilla of *X. caballeroi* in not containing a *ductus hermaphroditicus*.

Xystretrum moretonense differs from both the above species in that a genital papilla is lacking or small in size and not protuberant, or barely so. The male and female ducts open separately into a shallow atrium. A short but true cirrus is present, as well as a characteristic prostatic vesicle (Figs. 2-3). *Xystretrum hawaiiense* Yamaguti, 1970 appears to be distinctive in possessing a "pseudohermaphroditic pouch" and ciliated metraterm. It lacks a prostatic vesicle.

Parukhin (1964) named *Xystretrum abalistis* from *Abalistes stellaris* (Bloch & Schneider) in the Gulf of Tonkin. He distinguished it from *X. solidum* on the absence of transverse striae and from *X. pulchrum* by its lobed vitellaria, size of gonads and eggs. Its possible identity to *X. moretonense* must await study of the terminal ducts.

Ventral striae are best developed in *X. solidum* and are fewer and inconspicuous in *X. moretonense* and *X. caballeroi*. There seems to be considerable individual variation in the lobing of the testes and of the vitellaria, and in the size of the thin-shelled eggs. The terminal genital ducts deserve more attention than has been given to them in this genus.

Manter, 1972

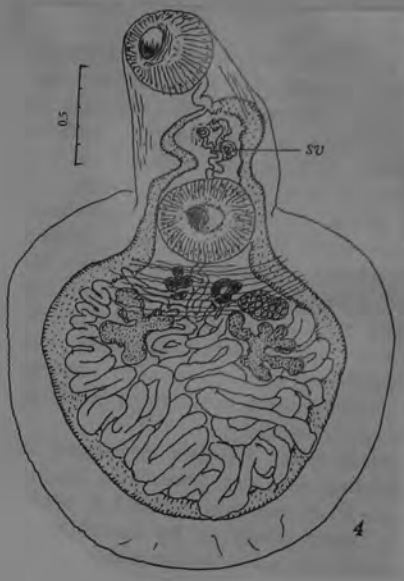
Xystretrum plicoporatum sp. ~~nov.~~
(Figs. 4-6)

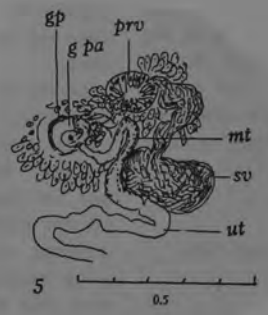
Host: Balistidae; triggerfish.
Locality: Moreton Bay region, Queensland.
Location: Urinary bladder.
Number: 5 in 2 of 3 hosts.
Holotype: USNM Helminth. Coll. No. 71850.

Description: Length 2.280 to 3.781 mm; greatest width 1.368 to 2.470 mm. Body mostly smooth except for slender processes around aperture of acetabulum. Plications of hindbody inconspicuous, close together, immediately postacetabular, about 10 to 30 in number, no seen posterior to middle of hindbody. Oral sucker 382 to 523 wide; acetabulum 409 to 563 wide; sucker width ratio 1:1.07 to 1.1 Esophagus 134 to 141 long; cerca forming cyclocoel; postcecal space 228 to 415 long.

Genital pore median, slightly posterior to intestinal bifurcation, large when expanded, and with conspicuous plications when contracted (Fig. 6). Testes symmetrical, just anterior to middle of hindbody, deeply lobed. Seminal vesicle bipartite: posterior part ovoid, wider than long, connection with anterior part emerging about 1/3 from one end of posterior part (Fig. 5); anterior part a sinuous tube, with gland cells, narrowing to enter posterior end of ovoid prostatic vesicle. Prostatic vesicle with tall, more or less pointed, nucleated cells. Pars prostatica short; cirrus about same length as pars prostatica. Genital papilla sometimes conspicuous, sometimes not evident, containing only male duct.

Ovary ovoid, wider than long, smooth or slightly lobed, immediately anterior to left testis (or right testis in one specimen). Vitellaria lobed, symmetrical, not far apart, immediately preovarian. Uterus with diagonal or transverse descending and ascending coils, over lapping medial but not lateral sides of ceca, and with short preacetabular coils. Metraterm glandular rather than muscular, opening into genital atrium close to opening of cirrus. Eggs 30 to 40 by 18 to 24 .





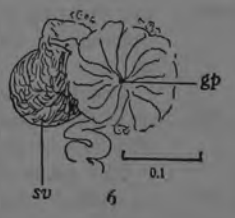


Fig. 4. *Xystretrum plicoporatum*. *Holotype*. Ventral view.. Fig. 5. *X. plicoporatum*. Holotype. Ventral view of terminal genital ducts. Fig. 6. *X. plicoporatum*. Paratype. Ventral view of region of genital pore.

(over)

Excretory pore dorsal and at level of, or slightly posterior to, cyclocoel. Excretory vesicle not observed.

The name *plicoporatum* is from *plico* = folded and *poratum* = pore and refers to the folded border of the genital pore.

Discussion: This species is closely related to *X. moretonense*. Both species possess a prostatic vesicle with nucleated cells. Sizes agree and sucker ratios overlap. The deep lobing of the testes and vitellaria occurring in all five specimens of *X. plicoporatum* are usually lacking in *X. moretonense* but rarely do occur. The transvers estriae of *X. plicoporatum* are closer together and limited to the anterior half of the hindbody, whereas in *X. moretonense* they are not so close together and occur past the middle of the hindbody. The chief differences occur in the terminal genital ducts, especially the seminal vesicle. In *X. moretonense* the posterior part of the vesicle is tubular and the anterior saccular part enters the side, not the end, of the prostatic vesicle (Figs. 2-3). The metraterm is thick-walled in *X. moretonense*, and the genital pore less (although somewhat) plicated. These characters, together with the unrelated hosts, appear to justify the two species.

GORGODERIDAE

Xystretrum pulchrum (Travassos, 1921) Manter, 1947

HOST: *Balistes capistratus* Shaw, trigger fish, "humu-humu mimi"; in 1 of 3 specimens examined.

LOCATION: Urinary bladder.

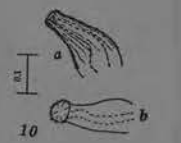
SPECIMEN DEPOSITED: U. S. Nat. Mus. Helm. Coll. No. 37467.

This single specimen is assigned to the species *Xystretrum pulchrum* rather arbitrarily on the basis of sucker ratio (1:1.27). Manter (1947) summarized the status of the species of *Xystretrum*. *X. pulchrum* was distinguished from *X. solidum* on the basis of a different (smaller) sucker ratio and less abrupt widening of the posterior portion of the body.

Manter (1947) listed sucker ratios for *X. pulchrum* from 1:1.30 to 1.5 while the sucker ratios for *X. solidum* range from 1:1.5 to 1.86. The single specimen from Hawaii has a sucker ratio of 1:1.27—smaller than any of the recorded ratios for either species, though closer to those of *X. pulchrum* than of *X. solidum*. Eggs in a single specimen vary greatly. Manter recorded egg sizes for *X. solidum* ranging between 29 by 19 μ and 44 to 48 μ by 27 to 29 μ; and egg sizes for *X. pulchrum* varied from 41 μ by 20 μ to 51 μ by 42 μ. Random selection of eggs from my specimen vary from 39 to 57 μ by 19 to 26 μ. Although the 51 μ by 42 μ measurement is an exception, as a rule eggs of *X. pulchrum* tend to be relatively narrower than those of *X. solidum*, and in most instances are more than twice as long as wide.

The cirrus of the Hawaiian specimen is covered with minute papillae (Fig. 10a). A study of 5 specimens of X. *pulchrum* and 51 specimens of *X. solidum* from Tortugas, Florida did not reveal the presence of numerous papillae on the cirrus, although two specimens of *X. pulchrum* had a very few papilla-like structures at the tip of the cirrus (Fig. 9b). More specimens from Hawaii might indicate a new species based on the numerous papillae of the cirrus together with the apparent absence of striae on the posterior portion of the body, the smaller sucker ratio, and the very minute body spines.

The single specimen fom Hawaii measures: 4.088 mm. long, the forebody being 1.533 by 0.803 mm. (at juncture of two parts of body), and the hind body 2.555 mm. long by 2.154 mm. at testicular level.



From Hanson, 1955

Siddiqi & Cable, 1960
Consider This a synonym of *X. solidum*

131. **Xystretrum pulchrum** (Travassos, 1921) ~~n. comb.~~ Manter, 1947

Fig. 95

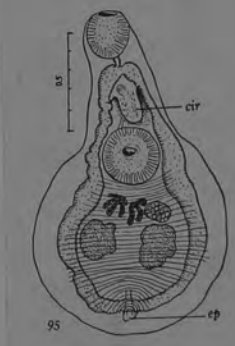
SYNONYM: *Macia pulchra* Travassos, 1921.

HOST: *Sphoeroides splengeri* (Bloch), puffer; in 2 of 36 hosts examined; 9 specimens.

LOCATION: Urinary bladder.

Discussion: Travassos (1921) named *Macia pulchra* from the urinary bladder of a puffer, *Sphoeroides testudineus* (Linn.) from Brazil. His figure and description agree with my specimens except that he does not mention the hair-like spines or the ventral striae, but these structures might be lost or difficult to detect. The species is very similar to *X. solidum* but has a differ-

ent sucker ratio, and the posterior portion of the body does not widen so abruptly. Sucker ratios on 8 specimens were 1: 1.30; 1.37; 1.37; 1.38; 1.40; 1.43; 1.45; and 1.5. Travassos states that the average sucker measurements are 0.49 and 0.71 mm, a ratio of 1:1.46 but his figure shows a much smaller ratio. In my specimens of *X. solidum* the ratio is consistently higher although may be as small as 1:1.5. Normal eggs in a single specimen of *X. pulchrum* vary from 41 by 20 μ to 51 by 42 μ. Some of them hatch in the uterus.



from:Overstreet, 1969

Xystretrum pulchrum (Travassos, 1921) Manter, 1947.

Hosts: *Balistes capriscus* (1 of 4); *Monacanthus hispidus* (1 of 6)*; *Sphaeroides testudineus* (5 of 6).

Site: Urinary bladder.

Discussion: Before Siddiqi and Cable (1960:282-283) reduced *Xystretrum pulchrum* to synonymy with *X. solidum*, the two were separated mainly by a sucker ratio of 1:1.5 or less in *X. pulchrum*, and a ratio of 1:1.5 or more with an abrupt widening of the hindbody in *X. solidum* (Manter, 1947:329-331).

Ten specimens from *Sphaeroides testudineus*, with varying degrees of widening of the hindbody, have sucker ratios of 1:1.1 to 1.8; the lower ratios are from small worms and two of the three with larger ratios are poor preparations. The sucker ratio of seven specimens from *Monacanthus hispidus* is 1:1.3 to 1.6 and 1:1.3 in one worm from *Balistes capriscus*. Manter (1947) reported *X. solidum* from *B. capriscus* and *X. pulchrum* from *Sphaeroides splengeri*.

XYSTRETRUM