1990

Binder 138, Monorchiidae L-M [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

Lasiotocinae n. subfam.

Subfamily diagnosis. — Monorchiidae: Body oval, fusiform, very much elongated, spined. Acetabulum small, in anterior or middle third of body. Ceca usually long. Testes single or double, tandem or symmetrical, in posterior half of body. Cirrus pouch extending back of acetabulum. Genital pore median or submedian, preacetabular. Ovary submedian, pretesticular. Receptaculum seminis present or absent. Vitellaria follicular or tubular, largely or entirely in pretesticular lateral fields, forming clusters or extending longitudinally. Uterus inter- and extracecal, mostly in hindbody, but may intrude into lateral fields of forebody. Excretory vesicle tubular or saccular.

Key to genera of Lasiotocinae

1. Testes symmetrical, terminal organ provided with sphincter at its anterior end, and receiving uterus just posterior to this sphincter ..... *Paramonorcheides*
   Testes tandem, vitellaria tubular; spined metraterm well differentiated, but not terminal organ; body slender ..... *Diplolasiotocus*
   Testes single; vitellaria follicular or acinous; terminal organ well developed 2
2. Excretory vesicle long, reaching intestinal bifurcation; genital atrium with spined diverticle; vitellaria extending longitudinally from level of acetabulum to posterior end of testis ..... *Proctotrematoides*
   Excretory vesicle not so long; genital atrium without spined diverticle; vitellaria bunch-like, less extensive 3
3. Eggs filamented..... *Pseudohurleytrema*
   Eggs not filamented 4
4. Terminal organ joining uterus at or near its base ... *Lasiotocus*
   Terminal organ joining uterus at or near its distal end ... 5
5. Uterus extending posterior to testis, ... *Genolopa*
   Uterus not extending posterior to testis, mainly extracecal ..... *Pristisomum*

Bartoli & Prevost (1966) also studied the type species of Lasiotocus, L. mulli (Stossich, 1883) Looss, 1907 in Odhner, 1911. The chief generic characters would be: seminal vesicle saccular; oral sucker not funnel-shaped; ovary not lobed; uterus entering side of terminal organ; cirrus and anterior portion of terminal organ spined; atrium unspined.

FROM HNHMS. NEW CALEDONIA

Genus *Lasiotocus* Looss, 1907

Syn. *Proctotrema* Odhner, 1911

Monorchiinae : Body elongate, fusiform or plump, spinulate. Oral sucker large, cup-shaped or funnel-shaped. Prepharynx well developed ; oesophagus short ; caeca usually not reaching posterior extremity. Acetabulum small, prequatorial, at or near junction of anterior and middle thirds of body. Testis single, median, in middle third or posterior half, much in front of posterior extremity. Cirrus sac extending behind acetabulum. Genital pore median or submedian, preacetabular. Ovary submedian, immediately pretesticular or to left of anterior half of testis. Receptaculum seminis absent or present. Laurer's canal present. Vitellaria short, lateral between acetabular level and testicular zone. Uterus ocupying most of hindbody reaching posterior end. Metratem prominent, broad saccular. Excretory vesicle tubular or saccular. Parasitic in intestine of marine fishes.

Genotype : *L. mulli* (Stoss., 1883) Looss, 1907

Indian species : *Lasiotocus odhneri* (Srivastava, 1939) syn. *Proctotrema odhneri* Srivastava, 1939, parasitic in *Equula dussumieri* Cuv. in Arabian Sea near Karachi.

FROM H. R. MEHRA (1966)

(MANTER + PRITCHARD, 1961)

These authors also suggested that *Lasiotocus* be separated from *Proctotrema* on the basis of an entire ovary versus a 3- or 4-lobed one. In some trematodes this character is variable. In the hemiurid, *Dichadena acuta,* for instance, the ovary may be entire or distinctly 4-lobed. Moreover, lobation may be a matter of degree which can vary with handling of specimens or with their age. However, our material can be allocated between *Lasiotocus* and *Proctotrema* as distinguished by Manter and Pritchard and, for that reason, the validity of both genera is accepted at this time. Actually *Lasiotocus* was never published by Looss as a formal name; instead it was mentioned in a subjunctive sense in criticizing the Rules of Nomenclature. However facetious the intent of Looss may have been, the Law of Priority establishes the validity of such names. Thus *Lasiotocus* would take priority over *Proctotrema* if those genera are considered to be synonymous.

FROM NAHHAS AND CABLE (1964)

LASIOTOCUS Looss,1907

This genus was named but not described by Looss (1907) who did, however, designate a type species. Looss did not intend the generic name to be valid.

Dollfus (1948) described the type species but did not give a diagnosis of the genus. The following is suggested:

Body rather thick,almost fusiform; spined. Prepharynx, and esophagus present; ceca not extending posterior to testis. Excretory vesicle an undivided sac. Testis single, elongate. Cirrus sac large; cirrus with two groups of conical spines. Atrium unspined. Ovary ovoid; seminal receptacle present. Vitellaria in the form of two lateral clumps of few, more or less fused, [illegible] follicles, near midbody.

Type species: L.mulli (Stossich,1883) Looss,1907

Metraterm with two groups of spines

L. costaricae (Manter, 1940) in yellow-striped grunt or porgy; Galapagos Islands.
L. lethrini Yamaguti, 1953, in *Lethrinus* sp. and *Diagramma* sp.; Macassar, Celebes.
L. longicaecum (Manter, 1940) in *Anisotremus interruptus;* Galapagos Island. Also in *Anisotremus virginicus;* Florida.
L. macrorchis (Yamaguti, 1934) in *Plectorhynchus cinctus;* Toyama Bay, Japan.
L. malasi (Nagaty, 1948) in *Anampses* sp.; Red Sea.
L. odhneri (Srivastava, 1939) in *Equula daura;* Arabian Sea.
L. parvus (Manter, 1942) in *Haemulon flavolineatum;* Florida
L. plectorhynchi (Yamaguti, 1934) in *Plectorhynchus pictum;* Inland Sea, Japan.

Lasiotocus Looss, 1907

Syn. *Proctotrema* Odhner, 1911

Generic diagnosis. — Monorchiidae, Lasiotocinae: Body plump to elongate, spinulate. Oral sucker large, cup- or funnel-shaped; prepharynx sometimes very distinct; esophagus short. Ceca usually not reaching to posterior extremity. Acetabulum small, at or near junction of anterior with middle third of body. Testes single, median, in middle third or posterior half of body. Cirrus pouch extending back of acetabulum. Genital pore pre-acetabular. Ovary submedian, just pretesticular, post-acetabular. Receptaculum seminis and Laurer's canal present. Vitellaria forming symmetrical bunches of follicles in lateral acetabulo-testicular fields. Uterus occupying most of hindbody, opening into terminal organ at or near its base. Excretory vesicle saccular or tubular, long or short. Parasitic in intestine of marine fishes.

Genotype: *L. mulli* (Stoss., 1883) Looss, 1907 (Pl. 6, Fig. 67), in *Mullus barbatus;* Triest.

Other species:

L. bacilliovatus (Odhner, 1911) in *Mullus barbatus;* Triest.

L. costaricae (Manter, 1940) in yellow-striped grunt or porgy; Galapagos Islands.

L. lethrini Yamaguti, 1953, in *Lethrinus* sp. and *Diagramma* sp.; Macassar, Celebes.

L. longicaecum (Manter, 1940) in *Anisotremus interruptus;* Galapagos Island. Also in *Anisotremus virginicus;* Florida.

L. macrorchis (Yamaguti, 1934) in *Plectorhynchus cinctus;* Toyama Bay, Japan.

L. malasi (Nagaty, 1948) in *Anampses* sp.; Red Sea.

L. odhneri (Srivastava, 1939) in *Equula daura;* Arabian Sea.

L. parvus (Manter, 1942) in *Haemulon flavolineatum;* Florida

L plectorhynchi (Yamaguti, 1934) in *Plectorhynchus pictum;* Inland Sea, Japan.

Key to species of *Lasiotocus* from Hawaiian fishes

1. Vitellaria largely in testicular zone 2
   Vitellaria largely in pretesticular zone 3
2. Ovary pretesticular; eggs 23-28 × 10-16 μ . . . . . *L. ulua*
   Ovary paratesticular; eggs 13-16 × 9-12 μ . . . . . *L. weke*
3. Testis near posterior extremity; eggs 13-16 × 8-12 μ . . . . . *L. delicatus*
   Testis postequatorial; eggs 16-21 × 9-13 μ . . . . . *L. oculatus*

Yam., 1970

Notes from Bartoli (1965)

Position systématique.

L'étude des métacercaires âgées et celle des post-larves recueillies dans le rectum d'*A. vulgaris*, livrent suffisamment de caractères pour préciser la position systématique de cette espèce.

Au sein de la famille des *Monorchiidae* (Odhner, 1911), quatre genres sont extrêmement voisins : *Genolopa* Linton, 1910, *Lasiotocus* Looss in Odhner, 1911, *Proctotrema* Odhner, 1911 et *Proctotrematoides* Yamaguti, 1938 et l'on ne saurait parler de l'un sans le comparer aux autres. Leur ressemblance est telle que plusieurs auteurs ont fait tomber en synonymie certains de ces genres entre eux. S. H. Hopkins (1941) identifie les genres *Genolopa* et *Proctotrema* ; H. W. Manter (1942), les genres *Genolopa* et *Proctotrematoides* ; S. Yamaguti (1958) les genres *Lasiotocus* et *Proctotrema*.

Dès 1942, H. W. Manter a montré, après l'étude détaillée de *Genolopa ampullacea* Linton, 1910, espèce type, que l'on pouvait séparer ce genre de *Lasiotocus* et *Proctotrema* sur la base d'un atrium génital épineux, caractère qui fait défaut chez ces derniers. Si cet élément discriminatif est très satisfaisant, il est malheureusement d'une utilisation pratique délicate car le cirre ou le métraterme peuvent être éversés ce qui peut alors fausser l'observation. En outre, selon H. W. Manter (1963), les épines peuvent se briser lors de la fixation et être anormalement présentes dans l'atrium génital.

Le genre *Proctotrematoides* n'est pas reconnu par tous les auteurs. H. W. Manter (1942) transfère l'unique espèce *P. pisodontophidis* Yamaguti, 1938 dans *Genolopa*. Comme cette espèce possède une longue vessie et un diverticule atrial épineux, J. D. Thomas (1959) préfère retenir le genre *Proctotrematoides*. Bien que H. W. Manter et M. H. Pritchard (1961) aient fait remarquer la similitude structurale du diverticule atrial épineux de *P. pisodontophidis* et de celui de *G. ampullacea*, je m'accorde avec J. D. Thomas et ajoute à ses arguments l'originalité de la formule excrétrice de la métacercaire décrite par T. Hoshina (1951) soit : 2[(2+3)+(3+2)] = 20.

Les genres *Proctotrema* et *Lasiotocus* ont été à l'origine de nombreuses controverses. Certains auteurs comme S. H. Hopkins (1941) ne tiennent pas compte de *Lasiotocus*, A. Looss n'en ayant donné ni description ni diagnose. Mais selon R. Ph. Dollfus (1948), « *Lasiotocus* ne doit pas être rejeté » puisque A. Looss en a précisé l'espèce type. S. Yamaguti (1958) puis J. D. Thomas (1959) tiennent pour synonymes les genres *Lasiotocus* et *Proctotrema*.

En fin de compte, il convient d'adopter le point de vue de H. W. Manter et M. H. Pritchard (1961) qui proposent de séparer *Lasiotocus* de *Proctotrema* par la forme de l'ovaire, plurilobé chez *Proctotrema*, arrondi chez *Lasiotocus*.

La métacercaire des *Tapes* de Provence ne peut être intégrée dans *Genolopa* du fait de l'absence d'épines dans l'atrium génital. La forme de l'ovaire, avec son contour régulier, nous permet de la placer dans *Lasiotocus*.

Dans ce genre, de nombreuses espèces ont une ventouse orale allongée ; ce caractère permet d'éliminer : *L. beauforti* (Hopkins, 1941), *L. longovatus* (Hopkins, 1941), *L. costaricae* (Manter, 1940), *L. longicoecus* Manter, 1940, *L. lintoni* Manter, 1931), *L. truncatus* (Linton, 1910), et *L. cucuminatus* (Nicoll, 1915).

Parmi les espèces du genre *Lasiotocus* dont la vessie excrétrice est connue, seul *L. longicoecus* en possède une relativement longue, encore qu'elle n'atteigne pas tout à fait la ventouse ventrale (J. D. Thomas, 1959), chez les autres, elle est courte, sacciforme ou tubulaire. Malheureusement on n'en connait ni la forme ni la taille chez

L. elongatus MANTER, 1931, *L. lintoni*, *L. odhneri* (SRIVASTAVA, 1939), *L. malasi* (NAGATY, 1948), *L. truncatus* et *L. cacuminatus*. L'espèce provençale s'éloigne de *L. elongatus* et *L. truncatus* par la longueur différente de ses cœcums ; elle diffère de *L. odhneri* par son rapport ventousaire ; chez *L. lintoni* et *L. cacuminatus*, la forme de la ventouse orale n'est pas la même. L'espèce décrite ici se rapproche de *L. malasi* par la forme et la taille du corps, le rapport ventousaire et la localisation des différents organes. Elle s'en éloigne par la combinaison des caractères suivants : présence d'un prépharynx, d'un œsophage et d'une paire de taches oculaires dont on sait qu'elles subsistent chez la post-larve ; la poche du cirre et l'organe terminal, post-acétabulaires, ne forment pas « a large C-shaped structure » mais offrent une image semblable à un lambda ; l'atrium génital est très long.

Parmi les représentants des genres *Lasiotocus*, *Proctotrema*, *Genolopa* et *Proctotrematoides*, seuls *Proctotrematoides pisodontophidis* YAMAGUTI, 1938 et ce nouveau *Lasiotocus* possèdent une vessie dont l'extrémité antérieure dépasse la ventouse ventrale. J'ai désigné cette espèce du nom de *L. longicystis* n. sp. pour rappeler cet important caractère.

BARTOLI, 1965

Lasiotocus Looss, 1907. emend. Thomas, 1959

Generic diagnosis: Monorchiidae Odhner 1911. Body spinulate, more or less fusiform. Oral sucker almost spherical or funnel shaped. Prepharynx present. Pharynx large, oval or almost spherical. Oesophagus short. Ceca simple, terminating at posterior extremity or shortly behind level of testis. Acetabulum in middle third of body, larger or smaller than oral sucker. Testes single, preacetabular. Cirrus pouch with armed cirrus and vesicula seminalis, extending backward beyond acetabulum. Genital pore preacetabular. Genital atrium short or long. Ovary compact or lobed, sub-median, pretesticular. Receptaculum seminis rudimentary if present. Laurer's canal present. Vitellaria occur in bunches of follicles arranged laterally in acetabulotesticular region or extending almost beyond posterior region of gut ceca. Uterus occupying most of space in hind body, the proximal region acting as a well developed receptaculum seminis uterinus, terminal organ of uterus usually bipartite with or without a well developed sphincter anteriorly. Excretory vesicle short or extending to testicular region before bifurcating. Parasites in intestine of marine fishes.

Genotype *Lasiotocus mulli* Looss, 1907.

The species included in this genus in addition to the ones described in the present paper, are as follows: *L. bacilliovatus* (Odhner, 1911), *L. brevicaecum** (Manter, 1942), *L. beauforti** (Hopkins, 1941), *L. cacuminatus** (Nicoll, 1915), *L. costaricae* (Manter, 1940), *L. elongatus** (Manter, 1931), *L. himezi* Yamaguti, 1951, *L. lintoni** (Manter, 1931), *L. longicaecum* (Manter, 1940), *L. longovatus** (Hopkins, 1941), *L. macrorchis* (Yamaguti, 1934), *L. malasi* (Nagaty, 1948), *L. minutus** (Manter, 1931), *L. mulli* (Stoss., 1883) Looss, 1907, *L. odhneri* (Srivastava, 1939), *L. parvus* (Manter, 1942), *L. plectorhynchi* (Yamaguti, 1934), *L. trifolifer** (Nicoll, 1915) and *L. truncatus** (Linton, 1910).

L. cynoglossi differs from all other *Lasiotocus* species in possessing vitelline follicles extending from the acetabular level to the posterior end of the gut ceca and from all other species with the exception of *L. beauforti* in possessing an unusually long genital atrium. These differences are deemed insufficient to justify generic status.

There remain some doubts concerning the taxonomic position of certain species allocated to the genus *Lasiotocus*. Two species namely *L. trifolifer* and *L. cacuminata* may be described as *species inquirendae*, although they agree in the main with the generic diagnosis of *Lasiotocus*. It seems clear that they cannot be placed in the genus *Genolopa* in view of the fact that no spines are described from the genital atrium of either species. Certain other species appear not to be valid. Thus *L. longovatum* Hopkins is probably a synonym of *L. lintoni*. Nagaty (1948) also claims that *L. odhneri* is a synonym of *L. lintoni* and *L. beauforti* is a synonym of *L. longicaecum*. The question of the synonymy of the latter 2 species is discussed below.

MONORCHIIDAE Odhner, 1911
The Genera *Proctotrema* Odhner, 1911, and *Lasiotocus* Looss, 1907 in Odhner, 1911

Bartoli and Prevot (1966) restudied the type species of *Proctotrema*, *P. bacilliovatum* Odhner, 1911, and decided this genus should be considered monospecific, all other species named in it to be moved to *Lasiotocus*. The chief generic characters of *Proctotrema* would then be as follows:

Seminal vesicle a coiled tube rather than saccular; "vagina" or terminal organ a simple enlargement of end of metraterm, armed with a single cluster of large spines; genital atrium unarmed; eggs long and narrow (length about three times width); ovary three- or four-lobed; acetabulum funnel-shaped. Type and only species: *P. bacilliovatum* Odhner, 1911.

The most distinctive of these generic characters is the tubular, rather than saccular, seminal vesicle.

Bartoli and Prevot also studied the type species of *Lasiotocus*, *L. mulli* (Stossich, 1883) Looss, 1907 in Odhner, 1911. The chief generic characters would be: seminal vesicle saccular; uterus entering side of terminal organ; atrium unspined, without atrial sac.

Bartoli and Prevot did not attempt to subdivide the remaining species of *Lasiotocus*, now containing several species formerly in *Proctotrema*. The result is a rather large genus (at least 23 species). Manter and Pritchard (1961) proposed separating these species on the basis of a distinctly lobed ovary in contrast with an unlobed or indistinctly lobed ovary. Such a division can be made without difficulty if based on published descriptions and figures. However, these species are often based on a small number of specimens so that individual variations are not certainly known. Some species of the related genus, *Genolopa* Linton, 1910, show great variation in indentations of the ovary. Pending more information on the various species involved, the genus *Lasiotocus* in the sense of Bartoli and Prevot (1966) is accepted here.

From: Durio & Manter, 1968

1959

DISCUSSION

Five species of trematodes of the family Monorchiidae have been obtained from the intestines of fishes in the sub-littoral zone off the coast of Ghana. All the species, with the exception of *Lasiotocus longicaecum* described by Manter (1940) from *Anisotrema interruptus* (Gill) and *A. virginicus* (L.) from the Galapagos Islands and the Tortugas, Florida, are new. The present record of *L. longicaecum* from the Ghanaian marine fish *Lethrinus atlanticus*, therefore, constitutes a new geographical and host record.

The specificity of the new worms appears to be of a high order. Each one was invariably encountered in a single species of host fish although 526 individuals of 60 species of fish were examined for parasites. *L. longicaecum*, on the other hand, is less specific. Thus, Manter recorded his specimens from fishes of the family Haemulidae, whereas the present specimens were recorded from the different, though closely allied, family Lethrinidae. In general, however, the present observations support the contention of Manter (1955) that host specificity is of a high order among digenetic trematodes of marine fishes, particularly those living in warm seas.

The widespread geographical distribution of *L. longicaecum* and the remarkably close resemblance of the forms on both sides of the Atlantic with those in the Pacific indicate that this species is monotypic. Monotypy in this case is not unexpected in view of relatively low degree of host-specificity and the free-ranging habits of the host-fishes. By contrast there is some evidence that *L. cynoglossi*, a parasite of the sedentary tongue-sole, may be a polytypic species. The differences between the populations of this species from the Accra and Takoradi areas is probably genotypic rather than phenotypic in nature as the host fish is the same in both cases. Further, it would appear that these differences are not caused by a variation started by a single fertilized egg but are of a more generalized nature as the parasites were found in several host fishes. It is hoped that further sampling will become possible to verify the extent of this trend.

In the case of *Diplomonorcheides magnacetabulum* it has already been shown that the form from the vicinity of Accra is indistinguishable from those in the Sekondi area although occurring in the same host fish as *L. cynoglossi*. This apparent anomaly may be due to the fact that *D. magnacetabulum* is less subject to change than *L. cynoglossi* or alternately that it is of more recent origin.

The origin of species or the formation of polytypic species amongst digenetic trematodes would be favored by the isolating effect resulting from the relative immobility of either the definitive or the molluscan intermediate host. In the present instance the immobility of the definitive host may well be important. The high order of specificity shown by digenetic trematodes and their peculiarity in requiring 2 hosts including the relatively inert mollusc for the completion of the life-cycle would appear to enhance the prospects of isolation and hence speciation, despite the apparently constant environment in which the parasites live.

SUMMARY

1. Five species of digenetic trematodes including 1 previously described species, new records and 3 new species are describd from Ghanaian sub-littoral marine fishes.

Lasiotocus chaetodipteri n. sp. from *Chaetodipterus lippei* Steind.; *Hurleytrema trachinoti* n. sp. from *Trachinotus goreensis* C. & V.; and *Diplomonorcheides magnacetabulum* n. g., n. sp. from *Cynoglossus goreensis* Steind. The populations of *L. cynoglossi* n. sp. from the Accra and Sekondi areas show differences which are considered to be sub-specific. The sub-species from the Accra area is named *L. cynoglossi magniovatus* n. sp., n. sub. sp. and that from the Sekondi area *L. cynoglossi major* n. sp., n. sub. sp.

2. The present record of *L. longicaecum* provides new geographical and host records.

3. The possible synonymy of the allied genera *Lasiotocus* Looss, 1907, *Proctotrema* Odhner, 1911, *Genolopa* Linton, 1910, *Paraproctotrema* Yamaguti, 1934, and *Proctotrematoides* Yamaguti, 1938, is discussed. It is concluded that the genera *Genolopa* and *Proctotrematoides* should be retained unless it can be proved that the spines described as being atrial spines in the type-species are in reality the spines of the genital ducts. With the exception of the type species of *Genolopa* and *Proctotrematoides* and *G. fusiforme* (Yamaguti, 1934) and *G. lethrini* (Yamaguti, 1953) all other species allocated to the genera listed above should be included in the genus *Lasiotocus*.

4. With the exception of *L. longicaecum* the trematodes found during the present investigation appeared to show a high order of host-specificity.

5. It is suggested that *L. longicaecum* may be a monotypic species and *L. cynoglossi* a polytypic one. The origin of polytypy in the latter species would be favored by the isolating effect resulting from the relative immobility of the definitive host.

6. It is suggested that the high specificity of the digenetic trematodes and their peculiarity in requiring 2 hosts including the relatively inert mollusc for the completion of their life cycle would appear to enhance the prospect of isolation and hence speciation despite the apparently constant environment in which the parasitic stages live.

LASIOTOCUS MULLI (M. Stossich, 1883) A. Looss, 1907 *in* T. Odhner, 1911

Cette espèce, type du genre *Lasiotocus*, a été très sommairement décrite par T. Odhner (1911). Ne voulant pas empiéter sur la publication par A. Looss d'une étude de *L. mulli*, cet auteur se limita à l'indication de quelques caractères à partir d'exemplaires qu'il avait découverts dans le rectum de *Mullus barbatus* (Trieste).

C'est à R.-Ph. Dollfus (1948) que nous devons la seule bonne description de ce Trématode. Les spécimens étudiés provenaient de l'intestin terminal du même hôte (Castiglione : Algérie).

Malgré cette excellente étude, il nous a paru utile, après l'observation de nombreux exemplaires vivants, de préciser certains détails concernant principalement l'appareil génital.

Hôtes définitifs : *Mullus barbatus* et *M. surmuletus* L., ce dernier hôte étant nouveau.

Localisation : rectum.

Fréquence : *M. barbatus :* 24 % ; *M. surmuletus :* 56 %. Le nombre d'individus dans un même hôte peut être très élevé.

Lieu et date de capture : Golfe de Marseille ; janvier 1966.

Autres localités connues : Trieste (M. Stossich, 1883 ; A. Looss, 1907 ; T. Odhner, 1911). Castiglione (R.-Ph. Dollfus, 1948).

Redescription de l'Espèce

Matériel de redescription : dix exemplaires provenant du rectum des deux hôtes.

Corps (fig. 1 *) : assez allongé. Dimensions ** : 800-2.350 (975-2.100) × 315-670 (400-600). Il s'amincit très nettement dans la région antérieure ; sa largeur est maximum au niveau de la ventouse ventrale. La cuticule est entièrement recouverte d'épines dont la densité décroît vers l'arrière.

Taches oculaires : deux masses pigmentaires asymétriques et très apparentes. Elles se localisent généralement dans la région dorsale du pharynx et se fragmentent parfois en une poussière de granules pigmentaires.

Ventouses : ventouse orale circulaire et terminale : 60-90 (67-75) × 58-93 (70-82). Ventouse ventrale arrondie, légèrement plus grande que la précédente : 75-120 (85-108) × 75-125 (95-112) ; elle est située entre le quart et les deux cinquièmes de la longueur du corps. Rapport ventousaire : 0,56-0,84 (0,68-0,84).

Appareil digestif : prépharynx généralement visible ; longueur maximum observée : 87. Pharynx cylindrique : 30-75 (50-75) × 30-50 (30-42). La longueur de l'œsophage varie avec l'état de contraction de l'animal : 37-170 (65-150). Les caecums digestifs, dont le point de bifurcation est situé vers la moitié de la longueur préacétabulaire, sont latéraux ; ils se terminent à la mi-hauteur du testicule.

Appareil génital :

Appareil génital mâle (fig. 2) : testicule de forme irrégulière, volumineux : 250-1.500 (500-1.200) × 100-350 (125-350). Son extrémité antérieure coïncide avec

Fig. 1. — *Lasiotocus mulli*. — Morphologie générale : vue ventrale

- over -

l'arrière de l'ovaire. Sa partie postérieure est terminale. Les deux spermiductes fusionnent à la base d'une poche du cirre de grande taille, toujours située sur la droite du corps : 200-400 × 75-275. La vésicule séminale est indivise ; il lui fait suite une importante *pars prostatica*. Les cellules prostatiques, très apparentes, ne sont pas

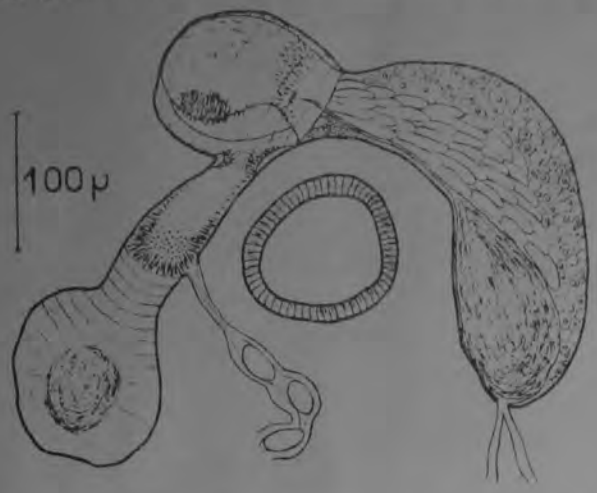


FIG. 2. — *Lasiotocus mulli*. — Atrium et terminaison des appareils génitaux mâle et femelle : vue dorsale

FIG. 3. — *Lasiotocus mulli*. — Région proximale de l'appareil génital femelle : vue dorsale

chromophiles. Le pénis, souvent protracté dans l'atrium génital, possède deux couronnes d'épines, l'une à sa base, l'autre formant un bouquet terminal. Quelques épines parsèment la surface comprise entre ces deux couronnes.

Appareil génital femelle (fig. 3) : l'ovaire, dont la forme est sensiblement arrondie, est toujours situé du côté droit, entre la ventouse ventrale et la partie initiale du testicule. L'oviducte est cilié sur la seconde moitié de sa longueur ; il débouche dans un petit réceptacle séminal situé à proximité de l'ovaire. Le canal de Laurer est long et presque rectiligne. Les vitellogènes sont formés de chaque côté par huit à neuf paires de follicules ; ils s'étendent en avant jusqu'au bord postérieur de la ventouse ventrale, en arrière jusqu'au niveau postérieur de l'ovaire. Les deux vitelloductes transverses confluent dans un petit réservoir vitellin, lequel débouche dans l'utérus, immédiatement en avant de l'ootype. Le réceptacle séminal utérin est toujours présent. L'organe terminal, bipartite, est situé du côté gauche ; ses dimensions sont : 175-300. La chambre proximale, ampulliforme, est fréquemment remplie de spermatozoïdes. La chambre distale, subcylindrique, est tapissée intérieurement d'épines réparties en deux groupes. Les œufs sont operculés et toujours munis d'un petit mucron sur le pôle opposé.

Atrium génital : de taille réduite, il est toujours dépourvu d'épines ; le cirre y est souvent protracté. L'orifice génital, de grande taille, est médian. Il est situé ventralement et en avant de l'acétabulum.

Appareil excréteur : la vessie, petite, est ampulliforme ; sa paroi est épaisse. Deux canaux collecteurs principaux débouchent dans sa partie antérieure, chacun recevant au niveau de la ventouse ventrale un canal antérieur et un canal postérieur drainant respectivement les flammes vibratiles de l'avant et de l'arrière.

Conclusions à l'étude des deux générotypes

Les fluctuations observées quant à l'attribution d'une espèce au genre *Proctotrema* ou au genre *Lasiotocus* montrent à quelles difficultés se sont heurtés les auteurs. Ces difficultés nous paraissent inhérentes à une decription trop sommaire des espèces types ; en effet, avant le travail de R. Ph. Dollfus (1948), on ne connaissait pratiquement pas *Lasiotocus mulli*. La description par T. Odhner (1911) de *Proctotrema bacilliovatum* restait encore assez succinte.

Une clarification de ce problème a été apportée par H. W. Manter et M. H. Pritchard (1961). Ces auteurs préconisent en effet la séparation de ces deux genres par la forme de l'ovaire, plurilobé chez *Proctotrema*, arrondi chez *Lasiotocus*.

Nous devons cependant constater que les différentes espèces attribuées au genre *Proctotrema* s'éloignent passablement du générotype. En effet, par l'ensemble des caractères relatifs à la vésicule séminale, à la taille de l'organe terminal et au point d'aboutissement du métraterme dans le vagin, *Proctotrema bacilliovatum* occupe une place nettement distincte parmi toutes les autres espèces de ce genre. Aussi, pensons-nous qu'il serait plus rationnel de considérer le genre *Proctotrema* comme monospécifique, les autres espèces se rattachant alors au genre *Lasiotocus*.

FROM BARTOLI + PREVOT, 1966

From Dollfus 1948

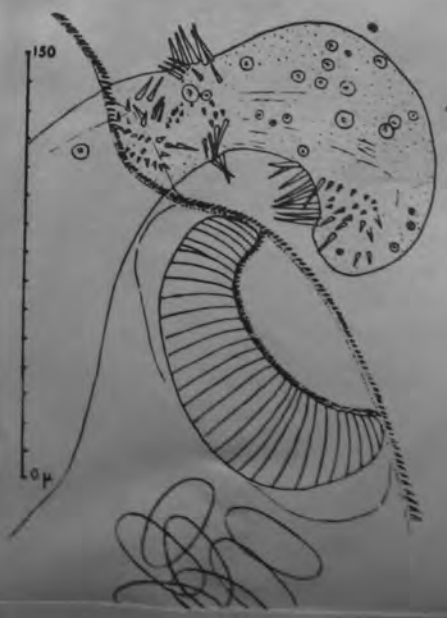
Lasiotocus mulli (Stossich,1883) Looss,1907

Body subcylindrical, a little wider than thick, almost fusiform, 2 3/4 to 5 times longer than wide; spined.
Suckers subequal. Prepharynx visible when body extended.
Esophagus about 2X length of pharynx; ceca not reaching the last fifth of body.
Excretory vesicle oval, in last body 6th.
Testis oval or almost fusiform, elongate, in posterior half of body.
Cirrus sac voluminous, oblique, up to or over 0.2 mm. long; width 0.07 to 0.1 mm. Cirrus with two groups of conical pointed spines up to about 16 u long, the distal group is on the oower face.; cirrus protrusible.
Ovary near midbody, ovoid. Seminal receptacle present, to left of base of cirrus sac. Vitelline follicles in two groups of a small number of follicles in close contact. Uterus filling a large part of posterior half. Metraterm 0.14 to 0.16 mm. long, with a proximal and a distal group of spines.
Eggs 37 to 39 by 17 to 22 u; mostly 38 by 19 u.
Host: Mullus barbatus L.
Locality: Trieste (Looss); Castiglione (Dollfus,1948)

Dimensions (en m.m.) de 5 spécimens ovigères montés *in toto* :

Longueur		0.767	1.040	1.033	1.131	1.43
Largeur		0.28		0.442	0.403	0.33
Epaisseur			0.351			
Ventouse orale	transversalement	0.080		0.096	0.084	0.064
	dorso-ventralement		0.068			
	longitudinalement	0.072	0.080	0.071	0.080	0.100
Ventouse ventrale	dorso-ventralement		0.095			
	transversalement	0.076		0.068	0.084	0.070
	longitudinalement	0.076	0.068	0.068	0.080	0.070
Prépharynx			0.036	0.008	0.052	0.008
Pharynx		0.048×0.036	0.056×0.040	0.048×0.041	0.064×0.044	0.048×0.032

Tous les spécimens examinés ont été récoltés par R. Dieuzeide à Castiglione (Alger). les 17-4-1946 et 9-5-1946.



Monorchiidae

from Fischthal & Thomas, 1969

Lasiotocus accraensis n. sp.
Fischthal & Thomas, 1969

Synonym : *Lasiotocus longicaecum* of Thomas, 1959, *nec* Manter, 1940.

Host : *Lethrinus atlanticus* Cuvier and Valenciennes, sea bream (Lethrinidae).

Location : Small intestine.

Locality : Accra, Ghana.

Specimens : USNM Helm. Coll. No. 63371 (holotype and paratype on same slide).

Discussion : Thomas' (1959) 2 specimens from the above host and locality, described as *L. longicaecum* (Manter, 1940) Yamaguti, 1954 (syn. *Proctotrema l.* Manter), have been restudied and are reallocated as *L. accraensis* n. sp. Through the courtesy of Dr. Harold W. Manter, University of Nebraska, we have been able to examine 1 specimen of *L. longicaecus* reported by Manter (1940), from *Anisotremus virginicus* (L.) (Pomadasyidae) from Tortugas Florida, and one reported by Manter and Van Cleave (1951) from *A. davidsonii* (Steindachner) from the Californian Pacific; also, through the courtesy of Dr. Raymond M. Cable, Purdue University, we have been able to examine 8 specimens reported by Nahhas and Cable (1964) from *A. virginicus* from Jamaica, West Indies. *L. accraensis* differs from *L. longicaecus* in the structure of the bipartite terminal organ. The latter in *L. longicaecus*, illustrated in figure 88 by Manter (1940), consists of an unspined posterior vesicle, and an anterior part (metraterm) with a large muscular sphincter both anterior and posterior to a short, spined middle region. In *L. accraensis*, illustrated in figure 5 by Thomas (1959), the metraterm lacks muscular sphincters and is entirely spined; the same spines continue into the anterior part of the posterior vesicle; additionally, some short, triangular, thorn shaped spines are unevenly distributed in the posterior vesicle. In both *L. accraensis* and *L. longicaecus* the distal end of the uterus, before entering the terminal organ, forms a short, thick walled, muscular structure. Thomas' Fig. 5 is a ventral view of the holotype; the vitelline ducts illustrated are dorsal to the ovary. In the holotype the ovary is bilobed, one lobe being dextro-dorsal with the oviduct emerging from it. A postoral circular muscle ring is present in both *L. accraensis* and *L. longicaecus*.

Lasiotocus **albulae** sp. n.
Figures 31 and 32

Host: *Albula vulpes* (6 of 7), type host.
Site: Intestine and pyloric caeca.
Holotype: U. S. N. M. Helm. Coll. No. 71313, paratype: No. 71374.

Description (based on 15 wholemounts and 3 sectioned specimens): Body elongate, 0.7 to 1.2 long by 0.17 to 0.35 wide, slightly wider at acetabular level; neck region attenuated. An immature individual 1.1 long. Spines on entire cuticle, more numerous on neck region. Eyespots or dispersed pigment granules in pharyngeal to midesophageal region. Oral sucker sometimes slightly tapered posteriorly but not funnel-shaped, 0.06 to 0.09 long by 0.08 to 0.10 wide. Acetabulum weakly developed, 0.07 to 0.12 by 0.08 to 0.12. Sucker ratio 1:1.0 to 1.3. Forebody 32 to 52% of body length. Prepharynx contracted, or elongated up to 0.07 in length. Pharynx 0.05 to 0.06 long by 0.04 to 0.05 wide; widest just postequatorial. Esophagus 2 to 5 times length of pharynx. Intestinal bifurcation anterior to acetabulum. Caeca terminating from level of posterior border of testis to near the end of the body.

Testis elongate, 0.10 to 0.17 long by 0.06 to 0.13 wide, in posterior ⅛ to ¼ of body. Posttesticular space 8 to 21% of body length. Cirrus sac slightly to strongly arcuate, 0.16 to 0.28 long; from midway between acetabulum and ovary and ovary; passing at a level dorsal to acetabulum; containing unipartite seminal vesicle, large saccate cells opening into pars prostatica, conspicuous prostatic cells, muscular cirrus with wide-based spines 4 to 5 microns long. Genital pore posterior to caecal bifurcation, median or slightly sinistral. Large, unspined genital atrium.

Ovary subglobular to subtriangular, 0.04 to 0.09 long by 0.05 to 0.10 wide, median to slightly dextral, overlapping anterior edge of testis. Terminal organ well developed, about ¾ as long as cirrus sac; anterior portion with slender spines up to 8 microns long; posterior portion unspined. Vitellaria 8 to 10 large or numerous small follicles on each side, from level of middle or posterior end of cirrus sac to near or beyond posterior border of testis. Many sperm in proximal loops of uterus. Uterus filling body beyond middle or posterior end of cirrus sac; distal portion muscular, entering terminal organ between middle of spiny portion and its junction with unspined portion. Eggs 13 to 17 by 8 to 11 microns.

Excretory vesicle short, occasionally overlapping testis posteriorly; pore terminal.

Discussion: The body is delicate and may be extended greatly. The anterior portion of the worm may be retracted within the body (Figure 32).

Lasiotocus albulae resembles *L. delicatus* Manter and Pritchard, 1961, in having a long esophagus and an oral sucker that is not funnel-shaped. It is, however, smaller than that species, has extensive vitellaria, and is most easily distinguished from *L. delicatus* by the presence of eyespot pigment.

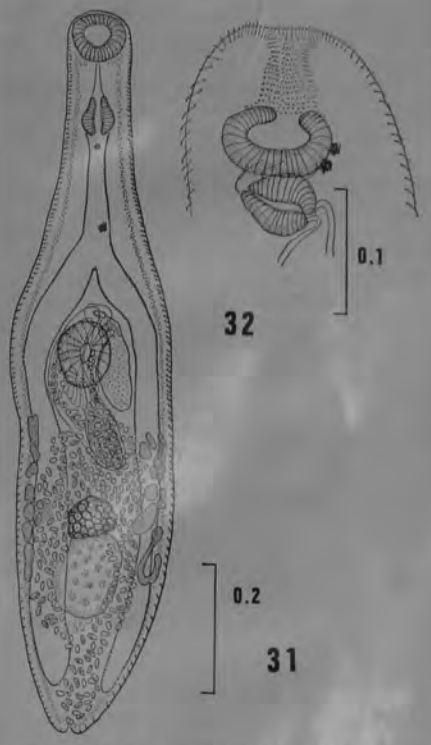


Figure 31. *Lasiotocus albulae*, holotype, ventral view. Figure 32. *Lasiotocus albulae*, withdrawn oral sucker.

Monorchiidae

Lasiotocus attenuatus n. sp. (Figs. 5–7)

Fischthal & Thomas, 1969

Description (based on 1 specimen in ventral and 1 in dextrolateral view; measurements are length by width by depth): Body 1,510–1,628 by 202 by 116, long, narrow, posttesticular body especially attenuated, width and depth greatest at acetabular level, anterior extremity truncate, posterior round; forebody 590–680 long, narrowest width and depth 128 at prepharynx level; hindbody 820–860 long, narrowest width 68 and depth 94 posterior to midlength of posttesticular space. Tegument spined to slightly beyond midlength of posttesticular space. Eye spots or their pigment granules absent. Oral sucker 178–194 by 144 by 133, subterminal ventral, funnel shaped. Postoral circular muscle ring present. Acetabulum 100 in diameter in holotype, 88 long in paratype, centre at level of anterior 42–44 per cent of body length. Sucker length ratio 1: 0·45–0·56. Prepharynx 82–116 by 34 by 39, elongate, muscular, surrounded by large vesicular cells in layer 7–16 thick, entering pharynx anteroventrally; pharynx 61–72 by 80 by 88; oesophagus 112–145 long, emerging from posterodorsal part of pharynx; caecal bifurcation 140–164 preacetabular; caeca long, extending to within 37–77 of posterior extremity. Excretory pore terminal; bladder not observed.

Testis single, 198–208 by 125 by 118, dextromedian, constricted in frontal plane into a ventral and a dorsal lobe in both specimens; posttesticular space 588–610 long. Cirrus sac 262–312 by 70 by 73, straight to slightly arcuate, usually overlapping part of gonads dorsally, dextral to terminal organ, commencing 92–176 postacetabular, terminating preacetabular. Seminal vesicle 138–145 by 51 by 70, saccular. Pars prostatica elongate, surrounded by prostate cells. Cirrus elongate, everted through genital pore in both specimens; on proximal part spines long, slender triangular, 19–20 by 3–4 at base; spines gradually becoming shorter, wider, broadly triangular distally, 9–10 by 4–7 at base. Genital atrium short, transversely oval, preacetabular. Genital pore median, preacetabular.

Ovary 97–102 by 85 by 85, median, with 2 smooth lobes, smaller lobe always dorsal with oviduct emerging from it, lying at posterior margin of acetabulum in holotype, 84 postacetabular in paratype, entire ovary lying ventral to anterior half of testis, slightly more ventral than latter. Ootype complex anterior to ovary. Vitelline follicles in lateral fields, 8 on right and 5 on left in holotype, anteriormost extent at posterior part of acetabulum in holotype, 50 postacetabular in paratype, extending posteriorly to just preovarian or to posterior part of testis; vitelline ducts dorsolateral to ovary, dorsal to testis, uniting preovarian to form short common duct.

Uterus extending to caecal ends near posterior extremity of body, filling most of posttesticular space and area sinistral to gonads, few coils at acetabular level, entering medial side of terminal organ anterior to posterior vesicle. Terminal organ 90–128 by 53–62, bipartite, thick walled, muscular, commencing at acetabular level in holotype, 40 postacetabular in paratype, terminating preacetabular; anterior part (metraterm) with long, slender, bristle like spines up to 21 long, some similar to long spines of cirrus; posterior vesicle 68–70 long, with some spines at distal end continuous with those of metraterm. Eggs numerous, yellow, operculate, 12 measuring 15–18 by 9–12.

Host: *Pomadasys jubelini* (Cuvier and Valenciennes), burro (Pomadasyidae).

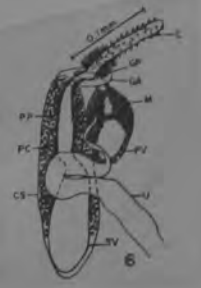
Location: Small intestine.

Locality: Elmina, Ghana.

Date: 25 March 1966.

Specimens: USNM Helm. Coll. No. 63372 (holotype); No. 63373 (paratype).


5


6


7

Discussion: In possessing an oral sucker shaped like an inverted bell, and a long prepharynx and oesophagus, our species appears closest to *L. beauforti* (Hopkins, 1941) Thomas, 1959, from *Orthopristis chrysopterus* (L.) (Pomacentridae) and *Lagodon rhomboides* (L.) (Sparidae) from North Carolina and the Gulf of Mexico. Our species differs from the latter in possessing a bilobed ovary and testis, and a short, transversely oval genital atrium lying entirely preacetabular; it differs further in the caecal bifurcation being considerably preacetabular, the cirrus sac overlapping the testis, and the ovary lying ventral to the testis. The species name, *attenuatus*, refers to the long, slender body of this trematode.

Monorchiidae

Lasiotocinae YAMAGUTI, 1958

Lasiotocus baiosomus n. sp.

(Figs. 9~12) Kamegai, 1970

Host: *Hemiramphus sajori* (TEMMINCK & SCHLEGEL).

Location: Intestine.

Locality: Tsushima Island, Sea of Japan.

Date: July 28, 1969.

Specimens: M. P. M. Coll. No. 16360.

Frequency: 125 in one host examined.

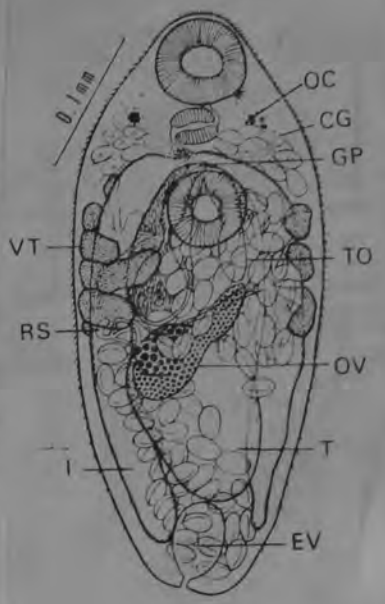
Description: Based on 107 specimens. Measurement based on 35). Body small, oval to elongate, 0.39×0.16 mm in holotype; 106 paratypes measuring 0.29—0.67 ×0.13—0.29 mm. Cuticle beset with minute spines except at posterior end of body. Numerous cervical gland cells in shoulder region. Oral sucker subterminal, 50—87×56—88 μ, slightly larger than acetabulum. Prepharynx short, 30 μ long; pharynx 32—56×28—47 μ, with eye-spot on either side; esophagus 50—65 μ long, bifurcating at posterior half of anterior third of body; ceca terminating a short distance from posterior extremity of body. Acetabulum 45—82×50—83 μ, with its center usually at posterior end of anterior third of body or sometimes a little more posteriorly. Sucker ratio 1:0.81—1.0.

Testis longitudinally elongated oval to elliptical, 0.12—0.25×0.08—0.15 mm, variable in position in posterior half of body, never beyond equatorial level. In holotype it lies at postequatorial level, measuring 137×87 μ, and its posterior margin separated from caudal end of body by 65 μ. Cirrus pouch club-shaped, muscular, slightly curved, 75—167×35—58 μ extending to equatorial level or a little beyond postequatorial level in small paratypes, containing saccular seminal vesicle, short pars prostatica, prostate cells, and eversible cirrus 45—65×15—23 μ. Greater part of cirrus armed with acicular broad-based spines, 7—10×3—5 μ; while strongly muscular distal part 15—20 μ long is spineless. Genital atrium unarmed, 30 μ long by 23 μ wide at its base when extended (fig. 10). Genital pore immediately preacetabular, in median line.

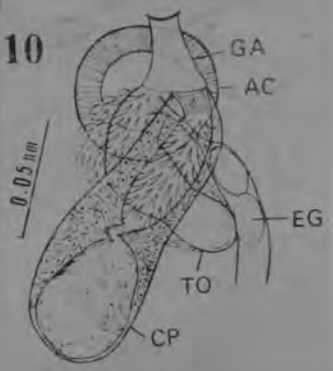
Ovary tri-lobed, 62—150×50—125 mm, extend in diagonal direction in submedian field at equatorial or postequatorial level, overlapping anterior end of testis ventrad. Germiduct ciliated inside, arising from central lobe of ovary to join small seminal receptacle, giving off Laurer's canal, and proceeds forward to receive vitelline duct. Proximal part of Laurer's canal ciliated inside, opens dorsally a short distance posterior to triangular vitelline reservoir in median line. Receptaculum seminis very small, rudimentary 15×8—9 μ appearantly non-functional containing no sperm; receptaculum seminis uterinum conspicuous at proximal part of uterus. Vitellaria lateral and dorsal, consisting of tubular or more rounded follicles, extending from acetabular zone to level of anterior end of testis or to middle of testis. Transverse vitelline ducts uniting with each other at level of anterior end of testis dorsally forming triangular vitelline reservoir 40—50 μ long. Uterus forming longitudinal loops, reaching to posterior extremity of the body, proceeding forward mostly ventral to cirrus pouch and terminal organ, opening as a short metraterm whose inside was covered with fine minute spines 5—8 μ long, into the genital atrium. Terminal organ retort- or club-shaped, 60—115×22—30 μ, proximal portion swollen, without spines, distal portion covered inside with acicular spines as in the cirrus, parallel to, or crossing ventrally, cirrus pouch, opening into genital atrium along with cirrus, surrounded by a layer of gland cells. Eggs persimmon-shaped, relatively thick shelled, embryonated, 25—30×15—18 μ in balsam (based on 50 measurement) with a small knob at anti-percular pointed pole. Excretory vesicle saccular 48—70 μ long, pore terminal.

Discussion: This species differs from most closely related species, *L. minutus* MANTER, 1931) THOMAS, 1959 and *L. parvus* (MANTER, 1942) YAMAGUTI, 1953, in longer caeca and a tri-lobed ovary instead of being oval or four-lobed. It differs from *L. minutus* in that the terminal opens into the anterior end of the distal portion of the terminal organ, and larger sized egg. It also differs from *L. parvus* in possesing an esophagus, different sucker ratio, and has a larger cirrus pouch.

The examination of the total 107 specimens taken from a single host revealed that the post-testicular spaces were markedly variable in spite of the fact that the size of the testes increased in relation to body size, (fig. 12).



9



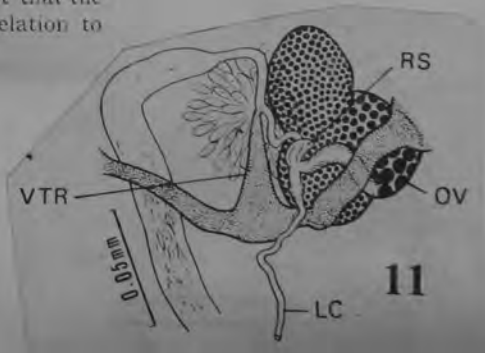


Fig. 12. A paratype of *Lasiotocus baiosomus* n. sp., showing the posterior location of testis.

Res. Bull. Meguro
Parasit. Museum
no. 4. Sept. 1970

Lasiotocus — Thomas, 1959

Pycnoterma
Genolopa beauforti n. sp. (Hopkins, 1941)

(See Figs. 5, 6, 3d, 9d, g)

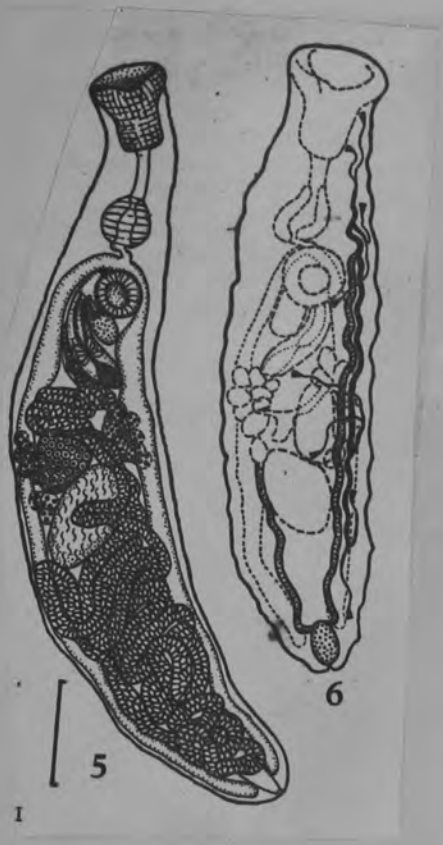
Body elongate, length four to seven times width, covered with cuticular spines about 10 μ long. Length of mature specimens 1.2 mm to 2 mm, width 0.25 to 0.35 mm. Oral sucker shaped like inverted bell with upper half twice as wide as lower half, 0.15 to 0.20 mm long and 0.13 to 0.16 mm wide; ventral sucker spherical, 0.08 to 0.11 mm in diameter, diameter about half length of oral sucker. Prepharynx longer than esophagus, nearly as long to twice length of pharynx. Pharynx very large, usually larger than ventral sucker. Esophagus short to twice as long as pharynx. Intestinal ceca reaching to posterior end of body. Genital pore at anterior edge of ventral sucker, slightly lateral to median line. A very long common genital sinus, sometimes longer than metraterm pouch, without spines. Cirrus pouch extending behind ventral sucker about half way to testis; cirrus armed with triangular spines about 8 μ long, distal portion of metraterm pouch armed with slender spines about 18 μ long. Uterus opening into metraterm pouch at junction of armed and unarmed portions, which is anterior to middle of pouch; loops of uterus filling all space between other organs from metraterm pouch to posterior end, but only slightly overlapping the intestinal crura. Ovary on right side just anterior to testis, nearly spherical with a slight tendency toward triangular shape. Testis about half way between ventral sucker and posterior end. Vitellaria consisting of compact groups of 8 to 10 follicles, on each side of ovary. Eggs 18 to 20 μ long and 12 to 15 μ wide. Excretory bladder a short undivided pouch reaching less than half way to testis; main collecting vessels dividing at level of ventral sucker into an anterior and a posterior branch; flame cell formula 2[(2+2) + (2+2)].

Host: Pigfish (*Orthopristis chrysopterus*).

Location: Intestine.

Locality: Beaufort, N. C.

Type specimen: U. S. Nat. Mus. Helm. Coll. No. 36779.



I

OO d

ΔΔΔ d

ΔΔΔ g

Lasiotocus beauforti (Hopkins, 1941) Thomas, 1959

Synonyms: Genolopa beauforti Hopkins, 1941;

Hosts: **Lagodon rhomboides* (L.), fam. Sparidae, in 1 of 29, *Orthopristis chrysopterus* (L.), fam. Pomadasyidae, in 4 of 12.

Site: Intestine.

Deposited specimens: USNM Helm. Coll. No. 40000.

from Gulf of Mexico
Nahhas & Powell, 1965

Proctotrema Monorchidae

Lasiotocus C. (N. 1915) Thomas, 1959

Paraproctotrema

~~Genotopa~~ cacuminata (Nicoll, 1915) Yamaguti, 1934

Elongated body, 2.1 to 3.25 by 0.5 to 0.64 mm. Posterior end pointed, neck slender. Spines apparently absent behind ovary. Oral sucker funnel-shaped, 0.15 by 0.13 mm. Ventral sucker 0.18 mm., 1/3 from anterior end. Long, narrow prepharynx, 0.19 ,,. Pharynx 0.12 by 0.11. Esophagus about same lenghh as prepharynx. Ceca terminate some distance from posterior end. Genital pore median, close in front of ventral sucker. Cirrus sac club-shaped, elongated, 0.7 by 0.25 mm. Cirrus spined. Vaginal sac about 2/3 length of cirrus sac. Divided by entrance of uterus into a proximal and a distal part. No spines seen. Ovary near base of cirrus sac, oval with oblique axis. Single median testis. Posttesticular space 1.mm. Follicles of vitellaria in an irregular row on each side from anterior border of ovary to posterior border of testis. No seminal receptacle. Eggs 22 by 12 u.

Host: Pomadasis hasta, grunter (Bloch)

Australia

Considered by Yamaguti (1934: 389) to be Paraproctotrema cacuminatum (Nicoll) Yamaguti

~over~

Lasiotocus cacuminatus (Nicoll, 1915)
(syn.: *Genolopa cacuminata*)

Хозяин, экстенсивность и интенсивность инвазии: *Pomadasys hasta*, 8,3%, 4–7 экз.
Локализация: кишечник и желудок.

FROM – Mamaev, 1970

Lasiotocus chaetodipteri n. sp. (Fig. 6) Thomas, 1959

Diagnosis: Body elongate oval; 0.80 to 1.07 long; 0.24 to 0.30 broad at widest point. Body surface covered with spines. Oral sucker funnel shaped, sub-terminal, 0.15 by 0.16 to 0.15 by 0.15. Ventral sucker in anterior third of body, almost circular, 0.08 to 0.09 by 0.08; appreciably smaller than ventral sucker. Ratio of oral to ventral sucker 1.66:1 to 1.77:1. Oral opening antero-ventral, opening into short prepharynx. Pharynx oval; 0.05 by 0.05 to 0.05 by 0.07. Esophagus short. Gut-ceca long; posterolaterally directed; terminating a short distance from posterior extremity. Excretory pore terminal, at posterior end of body. Excretory bladder tubular reaching to level of transverse yolk-duct before bifurcating. Genital pore preacetabular, median. Genital atrium short, oval. Testis single, median, with longitudinal axis diagonally placed, overlapping ventral sucker in contracted specimens, up to 0.18 behind ventral sucker in more extended specimens, 0.16 by 0.11 to 0.20 by 0.12. Cirrus pouch large, up to 0.30 long, with armed cirrus, tubular pars-prostatica, spherical vesicula seminalis and prostatic-cells. Ovary to left of mid-line, lateral to anterior portion of testis, up to acetabular level in contracted specimens, more posteriorly in extended specimens; trilobed; 0.08 by 0.06 to 0.09 by 0.07. Ootype and Mehlis's gland median, at ovarian level. Receptaculum seminis absent. Laurer's canal probably present but not seen. Uterus emerges ventrally from ootype; proximal region acts as receptaculum seminis uterinus; descending and ascending limbs of uterus fill most of post-ovarian space. Terminal organ of uterus well developed, consisting of proximal, spherical region with sperms and a terminal spined region. Uterus enters proximal region of distal chamber. Eggs oval, 0.015 to 0.02 by 0.0125. Vitelline follicles situated in 2 lateral groups opposite posterior portion of acetabulum and a little beyond; only in highly contracted specimens are vitelline glands found opposite ovary and testis. Transverse yolk duct preovarian, giving rise to posteriorly directed yolk duct.

Habitat: Intestine.
Type: In the helminthological collection, Zoology Department, University College of Ghana.
No. of specimens: 15.

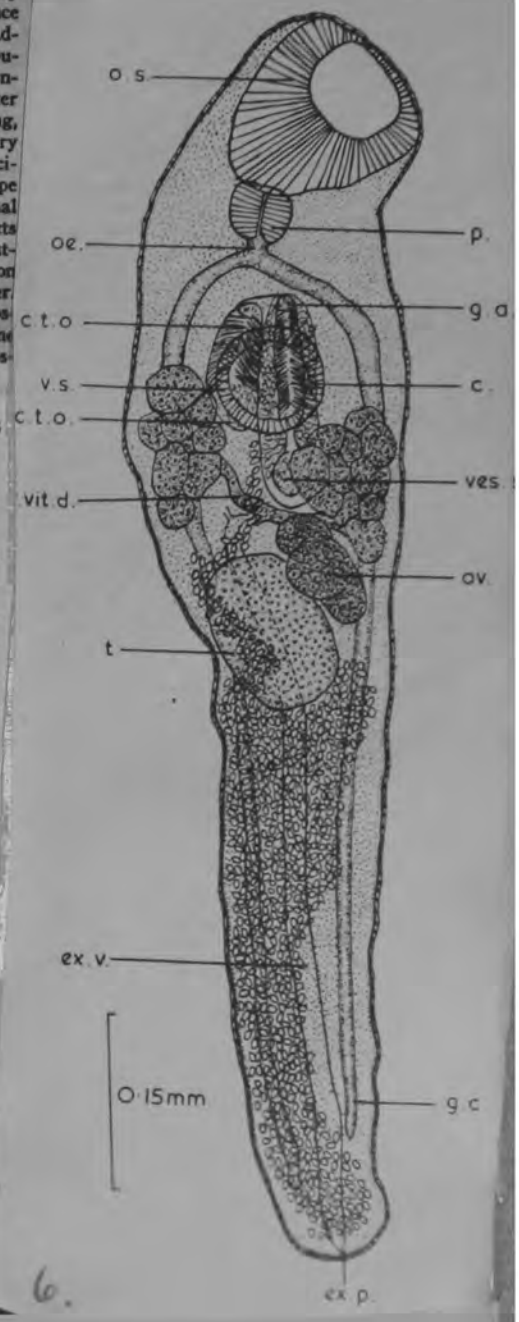
L. chaetodipteri may be distinguished from other species within the genus by a consideration of the following factors: In having a gut extending almost to the posterior extremity, it differs from *L. macrorchis, L. minutus, L. parvus, L. truncatus, L. himezi, L. plectorhynchi,* and *L. brevicaecum.* In having a ventral sucker appreciably smaller than the oral, it differs from *L. elongatus, L. brevicaecum, P. malasi, P. minutus* and *P. odhneri.* In having a long excretory bladder extending beyond the testis, it differs from *L. beauforti, L. longovatus, L. lintoni* and *L. mulli.* In having vitelline glands extending to acetabular level, it differs from *L. beauforti, L. longicaecum, L. plectorhynchi* and *L. cacuminatus.* In having short oval eggs, it differs from *L. bacilliovatus.* In having spines in the cirrus, it differs from *L. trifolifer.*

L. chaetodipteri resembles *L. trifolifer, L. bacilliovatus, L. longovatus,* and *L. lintoni* most closely and a re-examination of the type material of Nicoll (1915) may show that the present species is a synonym of *L. trifolifer.*

FROM: Mamaev 1970

Lasiotocus chaetodipteri (Thomas, 1959)
(syn.: *Proctotrema chaetodipteri*)

Хозяин, экстенсивность и интенсивность инвази *Pomadasys hasta*, 16,6%, 1—17 экз.
Локализация: кишечник и желудок.



6.

from Fischthal & Thomas, 1969)

Lasiotocus chaetodipteri Thomas, 1959

Description (based on 47 specimens; 10 measured): Body 891–997 by 218–325 at vitellarian level; anterior extremity truncate, posterior round; forebody 269–450 long, hindbody 450–549; tegument entirely spined; eyespots or their pigment granules absent; glands in parenchyma from acetabular to oral sucker level, ducts leading anteriorly dorsal to oral sucker, opening at anterior extremity; oral sucker 126–160 by 127–182, subterminal ventral, funnel shaped, same length and width to longitudinally or transversely elongate; postoral circular muscle ring present; acetabulum 87–97 by 82–94, almost round, centre at level of anterior 35–50 per cent of body length; sucker length ratio 1: 0·56–0·70; prepharynx short; pharynx 46–66 by 52–59, round to transversely elongate; oesophagus 26–75 long; caecal bifurcation 42–150 preacetabular; caeca extending almost to posterior extremity; testis single, 150–184 by 100–133, smooth, usually diagonally oriented; posttesticular space 222–360 long; cirrus sac 182–256 (longitudinal extent) by 69–87, straight to arcuate, slightly thick-walled, muscular, dextral to terminal organ, commencing 43–116 postacetabular, usually overlapping part

of gonads dorsally, extending preacetabular; seminal vesicle 110–118 by 61–73 (in 5), usually saccular, in some specimens with dorso-ventral windings simulating a bipartite structure; pars prostatica short, surrounded by prostate cells; cirrus 101–115 by 31–49, long, very thick walled, muscular, lined with triangular spines 9–15 by 5–9 at base; genital atrium short; genital pore median, just preacetabular; ovary 94–107 by 57–85, median to dextromedian, contiguous with testis, with 4 smooth lobes, 3 on 1 plane and other always dorsal, overlapping acetabulum up to 27 in contracted specimens, up to 36 postacetabular in more extended specimens; oviduct emerging from dorsal ovarian lobe, wall relatively thin; Mehlis' gland median, sinistral to ovary, pretesticular; vitelline follicles in lateral masses, some in interacecal field, extending from acetabular level to anterior part of testis; vitelline ducts dorsal to posterior part of ovary, uniting medianly to form short, anteriorly directed common duct; uterus extending almost to posterior extremity, usually postcaecal, usually filling posttesticular space as well as sinistral to testis, ascending between ovary and left vitelline field, distal end thin walled, entering middle of medial side of terminal organ; latter 94–116 by 35–48, bipartite, very thick walled, muscular, entirely spined with same shape and size spines as cirrus, posterior vesicle 53–72 long; eggs numerous, yellow, operculate, 20 measuring 18–24 by 12–14; excretory bladder tubular to saccular, extending anteriorly to anterior margin of testis, dorsal to latter, pore terminal.

Host: *Pomadasys jubelini* (Cuvier and Valenciennes), burro (Pomadasyidae).

Locations: Pyloric caeca, small intestine.

Localities: Tema, Cape Coast; Ghana.

Date: 3 March 1966 (Cape Coast).

Specimens: USNM Helm. Coll. No. 63370.

Discussion: Examination of some of Thomas' original specimens from *Chaetodipterus lippei* Steindachner (Ephippidae) from Ghana indicates that the ovary is also 4-lobed, and the terminal genitalia are spined as herein described. Because of the peculiar translucency of the original mounts spination in the posterior vesicle of the terminal organ was extremely difficult to discern, but was definitely observed nonetheless.

Lasiotocus Thomas, 1959

Proctotrema costaricae, ~~new species~~ MANTER, 1940

(Plate 44, fig. 90)

Host: A yellow-striped grunt or porgy, possibly of the genus Medialuna, taken in nearly fresh condition from the stomach of Seriola species

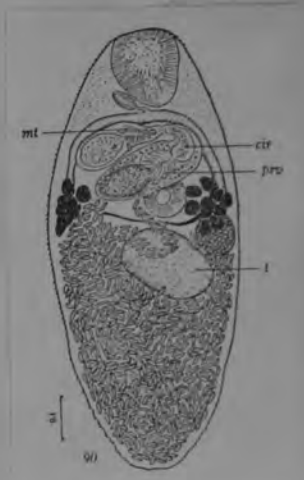
Location: Ceca and intestine

Locality: Port Culebra, Costa Rica

Number: 4 specimens

SPECIFIC DIAGNOSIS OF PROCTOTREMA COSTARICAE

Body oval to elongate, 0.786 to 0.995 by 0.397 to 0.450, rounded at each end, anterior end somewhat truncated; spined except near posterior end (in two specimens spines were lost). Oral sucker terminal, funnel shaped, longer than wide, 0.144 to 0.165 in width. Acetabulum about ⅓ body length from anterior end (at moderate body extension), 0.085 to 0.097 in diameter or a little over half the diameter of oral sucker. Genital pore median, posterior to intestinal bifurcation, varying from about midway between suckers to considerably nearer acetabulum. Prepharynx short; pharynx usually displaced to lie beside posterior portion of oral sucker, about twice as long as wide (0.068 by 0.032 in the type specimen); fairly short esophagus; ceca not reaching posterior end of body and apparently ending in region of testis. Testis approximately in midbody, not far posterior to acetabulum, ovoid; cirrus sac large, curved claviform in shape, extending diagonally backward and to the left, 0.262 to 0.285 long, 0.087 to 0.116 wide; large ovoid seminal vesicle in basal third of cirrus sac; middle third of sac containing a pars prostatica with large, tall, thin-walled cells and prostatic cells; distal third of sac containing a spined cirrus. Ovary to the right, immediately postacetabular and pretesticular, overlapping both testis and acetabulum, ovoid, smooth, longer than wide. Vitellaria consisting of 8 or 9 follicles in each of 2 widely separated lateral groups at the acetabular and ovarian level, the right group overlapping the ovary dorsally. Uterus filling almost the entire hindbody, partly overlapping testis; sperm cells present in early coils of uterus. Metraterm sac 0.202 to 0.262 long by 0.076 to 0.082 greatest width (almost as large as cirrus sac), extending along left side of and parallel to cirrus sac, containing a large metraterm vesicle (filling its basal half) and a spined metraterm. Uterus entering metraterm sac laterally just anterior to vesicle. Eggs elongate, 25 to 28 by 8 to 9 μ. Excretory vesicle not clearly seen, but in one specimen it seemed to be a very short sac.



Comparisons. Proctotrema costaricae differs from all previously named species, except *P. bacilliovatum* Odhner, 1911, in its long narrow eggs. It differs from *P. bacilliovatum* in shape of ovary and testis, in development of the thin-walled prostatic vesicle cells, structure of the metraterm sac, and in that the egg length is about 3 times the egg width instead of 4 times as in *P. bacilliovatum*. In both species the eggs are 8 to 9 μ in width, but in *P. bacilliovatum* they are 31 to 33 μ instead of 25 to 28 μ.

FROM: ALLAN HANCOCK PACIFIC EXPEDITIONS, VOL. 2, No. 1

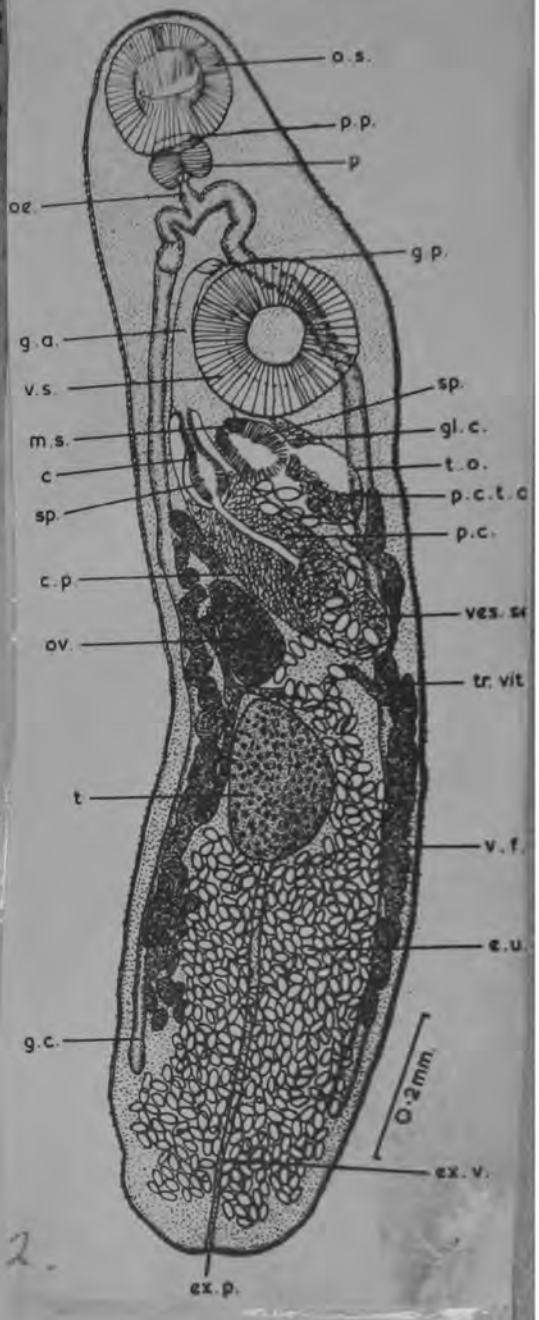
Lasiotocus cynoglossi n. sp. Thomas, 1959

Material of this species was obtained from the intestine of the tongue-sole, *Cynoglossus goreensis* Steind. from both collecting areas. The populations of this species from the 2 areas show certain interesting differences which are deemed subspecific in extent and are described below.

a. *L. cynoglossi magniovatus* n. sp., n. sub. sp. from the Accra area (Figs. 2–3)

Diagnosis: Body elongated; with more or less rounded ends; 1.0 to 1.54 long; 0.28 to 0.34 broad at widest point which is in the testicular region. Body surface covered with small backwardly directed spines which become progressively less dense posteriorly. Oral sucker subterminal; almost spherical; 0.09 to 0.15 in diameter. Ventral sucker in anterior third of body; separated from oral sucker by a distance ranging from 0.08 to 0.23, depending on degree of contraction of specimen; almost spherical; 0.12 to 0.20 in diameter; ratio of oral to ventral sucker 1 : 1.30 to 1 : 1.41. Extrinsic muscles poorly developed. Oral opening antero-ventrally situated on oral sucker, leading into a short prepharynx. Pharynx oval or spherical; 0.04 to 0.05 long; 0.05 to 0.07 broad. Esophagus short; up to 0.03 long; leading into postero-laterally directed gut-ceca which terminate a short distance from posterior extremity. Excretory pore subterminal at posterior end, opening into excretory bladder which extends anteriorly in median dorsal field to level of vitelline reservoir before bifurcating to give rise to antero-laterally directed main excretory ducts. Genital atrium elongated, lateral to ventral sucker or overlapping it; extending from posterior margin of ventral sucker to genital pore. Male and female ducts may open close together at base of atrium (Fig. 2) or cirrus may be everted and female terminal organ protruded into anterior portion of atrium as shown in case of *L. cynoglossi major* from Sekondi area (Fig. 4). Testis single; compact or faintly lobed; longitudinally oval; 0.12 to 0.21 long; 0.10 to 0.15 broad; situated in median line, a short distance behind ovary. Vas deferens short; arising from antero-dorsal margin of testis. Cirrus pouch large; arcuate; with well developed circular or longitudinal muscles; length variable; 0.25 to 0.37 depending on degree of contraction; breadth 0.09 to 0.11; basal portion with vesicula seminalis; middle region with tubular pars-prostatica of variable length; terminal region with cirrus. Cirrus beset with numerous spines; pyriform or tubular depending on degree of eversion; remainder of cirrus pouch filled with densely-staining prostatic cells. Ovary amphitypic, lying lateral to proximal end of cirrus pouch; oviduct short, arising dorsally from ovary and enlarging in the median line to form ootype; Laurer's canal short, originating from proximal region of oviduct and opening to exterior in mid-dorsal line above ootype; median yolk duct enters oviduct shortly before formation of ootype; receptaculum seminis absent; Mehlis's gland poorly developed. Uterus emerges ventrally from ootype; proximal region of uterus dilated with sperm and eggs and acts as a receptaculum seminis uterinus; descending and ascending limbs of uterus fill most of post-ovarian space not occupied by testis and vitelline glands; distal portion leads into a highly modified terminal organ which is surrounded on outside by glandular cells. Terminal organ bipartite; posterior chamber spherical, containing sperm; anterior chamber beset with bristle-like spines; opening into genital atrium through a muscular bulb-like sphincter; receiving uterus at its base. Eggs oval; operculate; 0.027 to 0.030 long, 0.02 broad. Vitelline glands consisting of numerous tubular or more rounded follicles, situated laterally beneath gut-ceca and extending from a short distance behind ventral sucker to a short distance in front of terminations of gut-ceca; transverse yolk duct large, situated in narrow space between ovary and testis; giving rise to ventrally directed median duct.

Host: Cynoglossus goreensis Steind.
Locality: Sub-littoral area of sea near Accra, Ghana.
Habitat: Posterior part of intestine.
Types: In the helminthological collection, Zoology Department, University College of Ghana.
No. of specimens: 12.



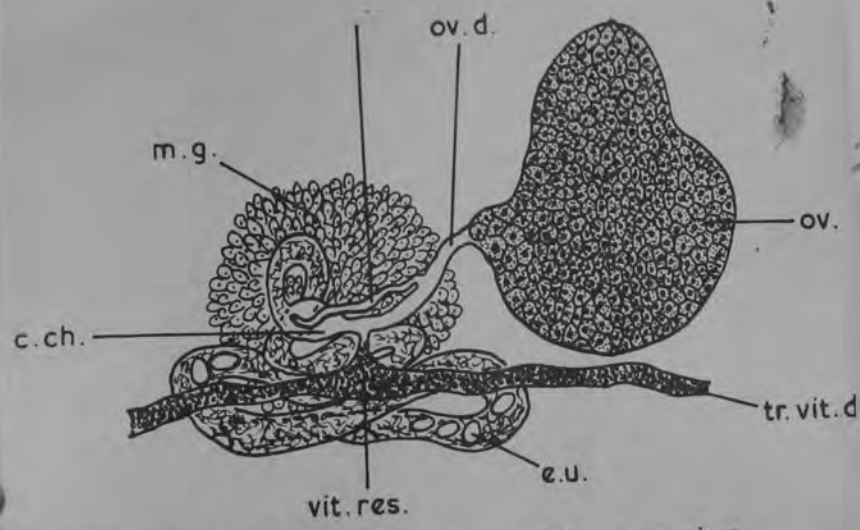


FIGURE 3. Ovarian complex of *L. cynoglossi magniovatus* n. sp., n. sub. sp.

from Fischthal & Thomas (1969)

Lasiotocus cynoglossi Thomas, 1959

Hosts : *Cynoglossus goreensis* Steindachner, *C. senegalensis* (Kaup), tongue soles (Cynoglossidae) ; *Synaptura lusitanica* Capello, sole (Soleidae).

Locations : Stomach, small intestine.

Localities : Tema, Cape Coast ; Ghana.

Dates : *C. senegalensis* : 21 December 1964 (Tema) ; *C. goreensis* : 29, 31 March, 9 April 1965 (Tema), 2, 4 March 1966 (Cape Coast) ; *S. lusitanica* : 29 March, 2 April 1965 (Tema), 21 February 1966 (Cape Coast).

Specimens : USNM Helm. Coll. No. 63364–6 (from *C. goreensis*) ; No. 63367 (*C. senegalensis*) ; No. 63368–9 (*S. lusitanica*).

Discussion : In the present collection some specimens are definitely *L. cynoglossi magniovatus* Thomas, 1959, and others *L. cynoglossi major* Thomas, 1959. However, others show one or more characteristics intermediate to those used by Thomas (1959) in separating these subspecies obtained by him at Accra and Sekondi, Ghana, respectively. Therefore, we declare the 2 subspecies synonymous.

Some of the present specimens, as well as some of Thomas' original material, have bristle like spines lining parts of or the entire posterior vesicle of the terminal organ, whereas in others spines are completely absent. We have observed this phenomenon in several other species reported in this paper. Bartoli (1965) noted for his new species, *Lasiotocus longicystis*, that the entire terminal organ is spined in the metacercaria, whereas the posterior vesicle is completely devoid of spines in postlarval forms recovered from experimentally infected *Anguilla vulgaris* Turton (Anguillidae). The presence of spines in the posterior vesicle of adult monorchiids may represent a neotenic condition, and, therefore, may be significant only at the population or subspecies level. Further study of this condition is

necessary to ascertain its significance in the classification of monorchiids.

In the present collection the bristle like spines in the anterior part (metraterm) of the terminal organ occur only at the proximal and distal ends, with a definite gap in the middle ; examination of some of Thomas' original material shows the same condition. The strong circular muscles of this structure appear striated, thus simulating spines. Bartoli and Prevot (1966) note this distribution of spines in *Lasiotocus mulli* (Stossich, 1883) Looss, 1907 ; additionally, they show the uterus entering the terminal organ anterior to the posterior vesicle. Contrariwise, Dollfus (1948) shows spines in the posterior vesicle and only at the distal end of the metraterm ; additionally, the uterus is shown entering the posteriormost end of the posterior vesicle. If both descriptions are correct, then they cannot be the same species ; they may even represent different genera, as Nahhas and Powell (1965) believe that the point of entry of the uterus into the terminal organ is of generic significance.

In many specimens the ovary is indistinctly 2-, 3-, or 4-lobed, 1 lobe always being dorsal with the oviduct emerging from it. The cirrus sac is quite thick walled, with outer longitudinal and inner thicker circular muscle layers. The excretory bladder extends to the middle of the testis or is entirely posttesticular.

MONORCHIIDAE

Lasiotocus cynoglossi Thomas, 1959

Host : *Cynoglossus senegalensis* (Kaup), tongue sole (Cynoglossidae).

Location : Small intestine.

Locality : Sierra Leone River estuary near Bullom, Sierra Leone.

Date : May 1969.

Specimens : USNM Helm. Coll. No. 70797.

Discussion : Our collection contains 8 adult specimens from 1 fish. This species was originally described by Thomas (1959) from *Cynoglossus goreensis* Steindachner from Ghana, and subsequently reported by Fischthal and Thomas (1969) in the latter species as well as in *Cynoglossus senegalensis* and *Synaptura lusitanica* Capello (Soleidae) also from Ghana.

From: Fischthal & Williams, 1971

b. *L. cynoglossi major* n. sp., n. sub-sp. from the Sekondi area (Fig. 4)

Thomas, 1959

Diagnosis: Measurements based on 6 mature specimens are as follows: Length 0.81 to 4.01; breadth 0.55 to 1.03; oral sucker 0.10 to 0.25 by 0.11 to 0.25; ventral sucker 0.15 to 0.37 by 0.14 to 0.33; ratio of oral to ventral sucker 1 : 1.46 to 1 : 1.65; distance between suckers 0.16 to 0.80; pharynx 0.09 to 0.14 by 0.11 to 0.15; testis elongated transversely, 0.10 to 0.33 by 0.18 to 0.48; ovary 0.08 by 0.39 to 0.08 by 0.26; distance from ventral sucker to posterior 0.74 to 1.03; eggs 0.015 to 0.020 by 0.012 to 0.015; vitelline glands tubular often showing diffuse branching, rarely as compact as in forms from the Accra area, covering an area of from 0.08 by 0.25 to 0.36 by 2.04.

Certain of the differences between the trematodes from the 2 areas cannot be attributed to size differences. These include differences in the egg size, the ratios of the oral and ventral sucker and the form of the testis and the vitelline glands. These differences which are discussed below are probably due to genetical factors but are considered to be, at most, sub-specific in extent.

Host: Cynoglossus goreensis Steind.

Locality: Sub-littoral area of sea near Sekondi, Ghana.

Habitat: Posterior region of intestine.

Type: In the helminthological collection, Zoology Department, University College of Ghana.

No. of specimens: 6.

The question of the synonymy of *Lasiotocus* Looss, 1907, *Genolopa* Linton, 1910, *Proctotrema* Odhner, 1911, *Paraproctotrema* Yamaguti, 1934 and *Proctotrematoides* Yamaguti, 1938 is a subject which has already occupied the attention of many authors. Lloyd and Guberlet (1932) and Yamaguti (1934) considered the probable synonym of *Proctotrema* Odhner, 1911 and *Genolopa* Linton, 1910 but were unable to reach a definite conclusion owing to lack of information. Manter (1940) on the other hand had suggested tentatively that *Genolopa ampullacea*, Linton's type species was generically distinct from *Proctotrema* on the basis of 2 kinds of spines associated with the cirrus sac. Later, Manter (1942) reaffirmed this conclusion although Hopkins (1941) had earlier claimed that the spination of the cirrus in *G. ampullacea* is in no way exceptional and that *Proctotrema* and *Genolopa* are congeneric. Manter admits, however, to having been in error in his earlier paper in describing the atrial spines as a median cluster of spines in the cirrus. Other suggestions put forward

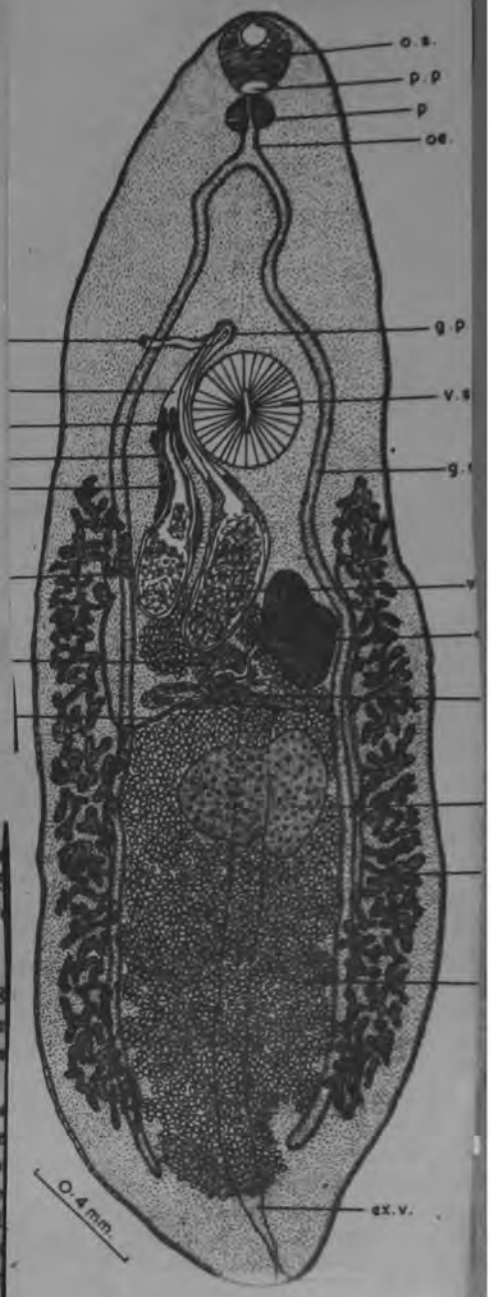
p18 to 10-2

as a synonym of *Genolopa* and that *G. elongatum* Manter, 1931 should be transferr to the genus *Paraproctotrema* Yamaguti, 1934. Nagaty (1948) and Sobolec (195 have accepted Manter's recommendations and in addition have included *G. trifolif* Nicoll, 1915 and *G. cacuminata* Nicoll, 1915 in the genus *Genolopa*.

Yamaguti (1953) has more recently reduced *Proctotrema* Odhner, 1911 to synonym of *Lasiotocus* Looss, 1907 although Odhner (1911) and Dollfus (1948 had previously maintained that the 2 genera are distinct. In a recent personal com munication Dollfus states, however, that he is now of the opinion that *Proctotrem* should be regarded as a sub-genus of *Lasiotocus*.

According to Yamaguti (1953) *Genolopa* should be separated from *Lasiotocu* on the ground that the uterus enters the terminal organ at its apex in the forme genus and near its base in the latter genus. The practical value of this distinctio is doubtful as in many of the original descriptions the point of entry is not mentione and in others including *G. plectorhynchi* Yamaguti, 1915; *G. cacuminata* Nicol 1915; *G. trifolifer* Nicoll, 1915; *G. longicaecum* Manter; and *L. himezi* Yamagu it is roughly midway between the anterior and posterior ends of the terminal organ The distribution of species proposed by Yamaguti is, therefore, unacceptable.

Manter (1942), as already pointed out, has offered an alternative way of distin guishing between the controversial genera *Genolopa* and *Lasiotocus* (=*Proctotrema*) On this basis several allied species might be included within the genus *Genolopa* These are as follows: *Proctotrema plectorhynchi* Yamaguti, 1934, *Paraproctotrem brevicaecum* Manter 1942, *L. lethrini* Yamaguti, 1953, *Proctotrematoides pisodon tophidis* Yamaguti, 1938, and *Paraproctotrema fusiforme* Yamaguti, 1934. Furthe examination shows that the spines figured in the atria of *P. brevicaecum* and *P. plec torhynchi* are not described in the text as atrial spines and can be interpreted a spines of the terminal male and female ducts. These 2 species cannot, therefore, b included within the genus *Genolopa*. *L. lethrini*, on the other hand, is described a possessing atrial spines and should be transferred to the genus *Genolopa*. In view o the fact that *P. pisodontophidis* differs fundamentally from *G. ampullacea* in possess ing an atrial diverticle and an excretory vesicle of pre-acetabular extent it would seem correct to retain the genus *Proctotrematoides* as suggested by Yamaguti (1953).



With the exception of these 3 species and *Proctotrematoides pisodontophidis* Yamaguti, all the species previously allocated to the genera *Lasiotocus, Proctotrema, Paraproctotrema,* and *Proctotrematoides* appear to conform to the generic diagnosis of *Lasiotocus* as given by Looss (1907). The diagnosis given by Dollfus (1948) and Yamaguti (1953) must be emended to indicate the variability of certain features including the point of entry of the uterus into the terminal organ.

It is noteworthy, in this connection, that there is considerable variation in the descriptions of the excretory systems of species allocated to this genus indicating that they may form a heterogeneous assemblage but in view of the incompleteness of our knowledge concerning the excretory system in certain species further work is necessary before this character can be used for classification purposes.

The generic status of *Paraproctotrema* has been upheld by many authors including Yamaguti (1934), Manter (1942), Nagaty (1948) and Sobolec (1955) on the basis of the well developed sphincter surrounding the distal end of the uterus prior to the formation of the terminal organ and the presence of the spiny atrium. The inclusion of *G. cacuminata* Nicoll, 1915 and *G. elongata* Manter, 1931 by Yamaguti (1934) and *P. brevicaecum* by Manter (1942) in the genus *Paraproctotrema* appears unjustified, however, as none of these species possess a spiny atrium or the characteristic sphincter. A detailed consideration of the type species of *Paraproctotrema* namely *P. fusiforme* Yamaguti shows that except for the presence of the uterine sphincter it conforms to the generic diagnosis of *Genolopa.* This character would appear insufficient to justify the erection of a genus and it seems advisable to reduce *Paraproctotrema* to synonymy with *Genolopa* as suggested by Yamaguti (1953).

Three species, namely *G. ampullacea* Linton, *G. fusiforme* (Yamaguti) and *G. lethrini* (Yamaguti), can be included within the genus *Genolopa.* It seems best to retain the genus *Genolopa* unless it can be proved that the spines in the genital atria of these species are those of the everted cirrus or protruded female

Lasiotocus delicatus n. sp.
(Figs. 5–7) Manter + Pritchard 1961

Hosts: *Naso* sp. (either *N. unicornis* (Forskål) or *N. brevirostris* (Cuv. & Val.)), type host (Acanthuridae, surgeonfishes); 2 specimens from 1 of 28 hosts. *Mulloidichthys auriflamma* (Forskål), weke-'ula (Mullidae, goatfishes); 2 specimens from 1 of 6 hosts. *Parupeneus multifasciatus* (Quoy & Gaimard), moano (Mullidae, goatfishes); 14 specimens from 7 of 29 hosts. *P. pleurostigma* (Bennett), malu (Mullidae, goatfishes); 1 specimen from 1 of 6 hosts. *P. porphyreus* (Jenkins), kumu (Mullidae, goatfishes); 6 specimens from 1 of 4 hosts.

Location: Intestine.

Holotype: U. S. Natl. Mus. Helm. Coll., No. 39469.

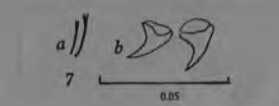
Description (measurements on 3 specimens): Body delicate; spined; 1.237 to 1.809 by 0.321 to 0.402; forebody long and slender 0.549 to 0.938 or about one-half body length; posterior end rounded; eye spots lacking. Oral sucker 0.080 to 0.100 in diameter; acetabulum 0.100 to 0.120; sucker ratio 1: 1.12 to 1.5. Prepharynx short; pharynx 0.056 to 0.062 long by 0.052 to 0.060 wide; esophagus very long, bifurcating just anterior to genital pore; ceca ending opposite anterior half of testis or up to a point slightly beyond testis, not reaching posterior to uterus. Genital pore median or submedian, a little anterior to acetabulum. Testis in posterior half of hindbody, somewhat longer than wide; cirrus sac large, claviform, 0.308 to 0.502 long by 0.064 to 0.112 wide, containing an ovoid seminal vesicle, well developed prostatic cells of two kinds (more posterior, transparent cells opening into short pars prostatica, more anterior cells lead to tip of cirrus), and long cirrus armed with large thorn-shaped spines (fig. 7); distal tip of cirrus sometimes evaginated into atrium. Ovary ovoid, unlobed, immediately anterior to and sometimes slightly overlapping testis. Vitelline follicles lateral, few, elongate, from level of acetabulum to ovary or anterior end of testis; uterus extending posterior to testis but not quite to posterior end of body. Terminal organ 0.241 to 0.308 long or not quite as long as cirrus sac. Uterus narrows to a muscular tube with a slightly swollen terminal region which enters middle of terminal organ. Metraterm armed with long, fine, needle-shaped spines; basal vesicle of terminal organ 0.048 to 0.087 wide, unspined. Genital atrium unspined. Eggs 16 to 17 by 8 to 10 microns. Excretory pore subterminal, ventral. Excretory vesicle short.

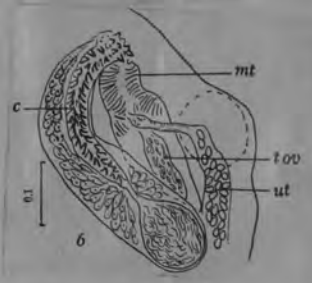
Discussion: The name *"delicatus"* refers to the soft, delicate condition of the adults most of which, although freshly collected, were somewhat macerated. The forebody is very thin and was often folded when the specimens were killed.

After the revisions proposed above, the genus *Lasiotocus* includes the following species: *L. mulli* (Stoss.); *L. beauforti* Hopkins, 1941; *L. cacuminatus* (Nicoll, 1915); *L. cynoglossi* Thomas, 1959; *L. costaricae* (Manter, 1940); *L. elongatus* (Manter, 1931); *L. lintoni* (Manter, 1931); *L. longovatus* (Hopkins, 1941); *L. longicaecus* (Manter, 1940); *L. malasi* (Nagaty, 1948); *L. minutus* (Manter, 1931); *L. odhneri* (Srivastava, 1939); *L. truncatus* (Linton, 1910).

The only one of these species with non-funnel shaped oral sucker and with esophagus much longer than the pharynx is *L. mulli;* it differs from *L. delicatus* in that the esophagus is only twice the length of the pharynx, the eggs are much larger, and the spines of the cirrus are different. *L. cacuminata* has an esophagus only twice the length of the pharynx, a funnel-shaped oral sucker, and the vitellaria are posterior to the cirrus sac.

Lasiotocus longicaecus described from *Anisotremus interruptus* from the Galapagos Islands and from *A. virginicus* at Tortugas, Florida, is also known from *A. davidsonii* at La Jolla, California, and from *Lethrinus atlanticus* from Ghana, Africa (Thomas, 1959). We also have specimens collected from *A. pacificus* by A. O. Foster in the Miraflores Locks, Panama Canal. We can confirm Thomas' observation on the extent of the excretory vesicle to the ovary or almost to the acetabulum. This species has a very wide distribution in related fishes from tropical African Atlantic to the Gulf of Mexico, to the Panamanian Pacific, Galapagos Islands, and north to La. Jolla, California.





30. *Lasiotocus delicatus* Manter et Pritchard, 1961

(Fig. 31)

HABITAT: Intestine of *Parupeneus multifasciatus* (local name "moano") and *P. pleurostigma*; Hawaii.

DESCRIPTION (based on 28 whole mounts): Body elongate, more tapered anteriorly than posteriorly, without eyespots, 1.0-2.2 × 0.3-0.42 mm. Cuticle densely armed anteriorly with very minute spines, which are, however, sparse at the posterior extremity. Oral sucker terminal, with ventral opening, 58-100 × 54-104 μ; prepharynx up to 58 μ long in completely relaxed specimen. Pharynx 50-81 × 46-81 μ; esophagus 0.15-0.77 mm long; ceca terminating near posterior extremity at level of testis. Acetabulum 0.09-0.14 mm in diameter, preequatorial.

Testis elongate, 0.27-0.42 × 0.08-0.13 mm, confined to posterior third of body. Cirrus pouch claviform, 0.23-0.55 × 0.07-0.14 mm, extending to near ovary, containing ovoid seminal vesicle (90-200 × 50-150 μ), tubular pars prostatica surrounded by two sorts of prostate cells, and cirrus covered inside with broad-based sharp-pointed spines 15-23 μ long by 9-12 μ wide at base. As described by Manter and Pritchard there are two kinds of prostatic cells, but in our specimens dark-stained cells are massed together directly around the pars prostatica and the clearer cells are distributed more extensively around the distal portion of the seminal vesicle and cirrus as well as around the above mentioned dark cells. Genital atrium unarmed, with wide median opening immediately in front of acetabulum.

Ovary oval, 0.08-0.2 × 0.07-0.13 mm, situated at about middle of posterior half of body, overlapping anterior part of testis ventrolaterally. Shell gland complex close to base of cirrus pouch. Uterus forming irregular longitudinal loops anterior and ventral to ovary as well as ventral to testis and on left ventral side; metraterm running forward between cirrus pouch and female terminal organ, constricted just before it enters the distal portion of the female terminal organ. Female terminal organ 50-120 μ wide, shorter than cirrus pouch, consisting of oval proximal sac 0.11-0.16 mm long by 50-90 μ wide and filled with sperm, and a cylindrical distal portion densely lined with acicular spines. Eggs oval, 13-16 × 8-12 μ in life. Vitellaria consisting, on each side, of several slender tubules, extending from acetabular level or immediately behind it to level of ovary or testis. Excretory system not determined.

Yam., 1970

Lasiotocus elngatus (Manter,1931) Thomas,1959

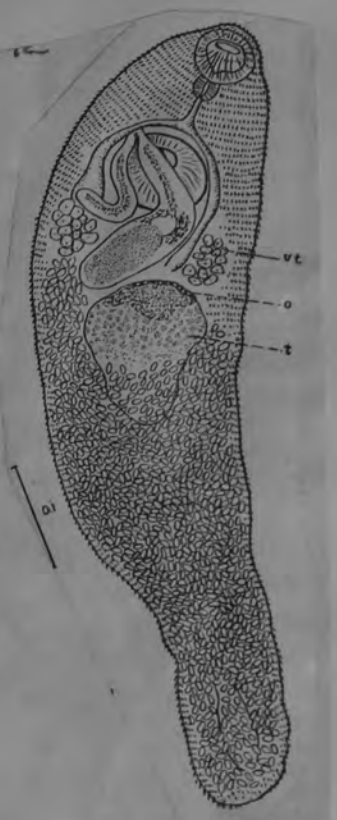
Syn. Genolopa elngata Manter,1931

8. **Genolopa elongata n.sp.** (Fig. 3).

Synonym: *Distomum* sp. Linton 1905, p. 360.
Host: *Menidia menidia*, silversides.
Position: intestine. Frequency: common.

Body elongate (*e.g.* 0·924 × 0·168 mm.), spined. Ventral sucker always larger than oral sucker (*e.g.* 57 and 42μ). Genital pore slightly to the left just in front of ventral sucker. Pre-pharynx lacking, oesophagus about as long as the pharynx. The caeca seem to be very short. They could not be traced very far posterior to the ventral sucker and the dense mass of eggs filling the entire posterior half of the body gives no indication of other organs. The large testis overlaps the ovary in front of it. Both cirrus and metraterm are spined. The metraterm is more elongate than in other species. The two inconspicuous groups of vitelline cells are lateral and just posterior to the ventral sucker. Eggs measure 16–19 × 7–9μ. The median stem of the excretory system is longer than in *G. minuta*.

This species is very distinct. It resembles *G. cacuminata* in body shape and sucker ratio. This latter species, however, possesses a distinct pre-pharynx, median genital pore, vitellaria in two lateral rows, and larger eggs.



Lasiotocus ghanensis n. sp. (Figs. 8, 9)
Fischthal & Thomas, 1969

Description (based on 21 specimens from small intestine, 11 measured, and 11 from stomach, 7 measured, of 1 host; data for each location presented separately; measurements represent ranges, with average in parentheses): Location: small intestine. Body 1,478–1,894 (1,687) by 270–340 (301), elongate, narrow, widest at acetabular level or just preacetabular, extremities round. Forebody 357–457 (393) long, relatively wide; hindbody 925–1,225 (1,127) long, tapering posteriorly; forebody to hindbody ratio 1 : 2·87. Tegument spined to testicular level or slightly posttesticular. Eyespots or their pigment granules absent. Oral sucker subterminal ventral, 140–168 (146) by 144–187 (173), transversely oval; preoral space 3–5 (4) long. Postoral circular muscle ring present. Acetabulum 133–184 (155) by 143–177 (157), round to slightly longitudinally or transversely elongate, centre at level of anterior 28–33 (30) per cent of body length. Sucker length ratio 1: 0·93–1·27 (1·06), only 2 specimens with acetabulum smaller than oral sucker. Prepharynx short, wide, thick walled; pharynx 97–110 (102) by 102–119 (112), slightly transversely elongate; oesophagus 85–153 (128) long, thick walled; gland cells anterolateral and posterior to pharynx and along oesophagus; caecal bifurcation overlapping anterior part of acetabulum; caeca usually wide, cell lined, following contour of gonads, terminating 174–315 (196) from posterior extremity, latter distance representing more than 11 per cent of body length. Testis single, smooth, 138–273 (195) by 123–195 (153), longitudinally elongate, intercaecal, may overlap caeca ventrally, contiguous with ovary or not; posttesticular space 510–783 (660) long, distance representing 39 per cent of body length. Cirrus sac dextral, usually arcuate but may be straight, 166–380 (308) by 85–115 (98), thick walled, muscular, commencing 165–230 (190) postacetabular, latter distance representing 11 per cent of body length, may overlap ovary and caeca dorsally, terminating dorsal to acetabulum. Seminal vesicle oval, 89–140 (119) by 53–97 (78). Pars prostatica tubular, surrounded by prostate cells as are adjacent parts of seminal vesicle and cirrus. Cirrus eversible, 170–198 (188) by 39–48 (42); triangular, thorn shaped spined on dextral wall measuring 5–14 by 3–7 at base; elongate, narrow spines on sinistral wall measuring 14–20 long. Genital atrium thick walled, muscular, transversely oval, unspined. Genital pore ventral to atrium, median, just preacetabular. Ovary median but may be dextromedian, intercaecal but may overlap caeca ventrally, in tandem with testis, smooth, usually longitudinally elongate but may be round, 70–101 (89) by 65–98 (79), lying 140–213 (177) postacetabular, latter distance representing 10 per cent of body length. Sperm in proximal part of uterus; seminal receptacle not observed. Laurer's canal present. Ootype complex dorsodextral to ovary. Vitellaria in 2 short, lateral masses of 7–10 large round to elongate follicles each, extending from level of seminal vesicle to that of testis, lying 48–160 (87) postacetabular, latter distance representing 5 per cent of body length. Vitelline ducts uniting dorsal to posterior part of ovary; reservoir small. Uterus extending postcaecally to near posterior extremity, descending and ascending sinistral to gonads overlapping latter ventrally, invading ventral space between gonads, ventral to cirrus sac, distal end undifferentiated, entering terminal organ on medial side just anterior to posterior vesicle. Terminal organ 186–242 (205) by 70–100 (83), thick walled, muscular, intercaecal but may overlap left caecum dorsally, medial wall usually contiguous with cirrus sac, extending 44–97 (65) postacetabular, latter distance representing 4 per cent of body length; posterior vesicle 75–109 (94) long, unspined; anterior part (metraterm) entirely lined with slender spines 14–25 long, muscular sphincter at distal end, surrounded by gland cells. Eggs relatively numerous, yellow brown, operculate, 32 measuring 20–29 (23·7) by 14–18 (15·7). Excretory bladder tubular to slightly saccular, 83–121 (98) long, entirely postuterine to slightly overlapping uterine coils; narrow duct connecting bladder to terminal pore.

Location : stomach. Body 1,301–1,803 (1,487) by 250–345 (307). Forebody 375–485 (438) long, hindbody 800–1,203 (915) long, forebody to hindbody ratio 1: 2·09. Oral sucker 150–165 (156) by 155–182 (170), transversely oval but appearing more spherical in contrast to intestinal specimens ; preoral space 13–27 (18) long, 3½ times longer than in intestinal specimens. Acetabulum 121–148 (134) by 128–146 (135), centre at level of anterior 29–38 (34) per cent of body length. Sucker length ratio 1: 0·78–0·92 (0·90), acetabulum always significantly smaller than oral sucker in contrast to intestinal specimens. Pharynx 86–102 (94) by 99–114 (107) ; oesophagus 108–150 (129) long ; caecal bifurcation overlapping acetabulum in 5 specimens, 27 and 38 preacetabular in 2 others ; caecal walls yellowish in colour in contrast to colourless walls of intestinal specimens ; caeca terminating very close to posterior extremity, postcaecal space 24–61 (43) long, latter distance representing 3 per cent of body length, much shorter than in intestinal specimens. Testis 129–170 (147) by 102–137 (118) ; posttesticular space relatively short compared to intestinal specimens, 350–535 (406) long, distance representing 27 per cent of body length. Cirrus sac 290–520 (390) by 71–97 (86), longer than in intestinal specimens ; commencing 210–410 (283) postacetabular, latter distance longer than in intestinal specimens, representing 19 per cent of body length. Seminal vesicle 64–130 (83) by 53–73 (65) ; cirrus 162–232 (190) by 34–46 (40). Ovary 56–93 (77) by 48–77 (59) ; lying 212–403 (279) postacetabular, latter distance longer than in intestinal specimens, representing 19 per cent of body length. Vitelline fields lying 135–305 (221) postacetabular, much farther posteriorly than in intestinal specimens, distance representing 15 per cent of body length. Uterus with relatively fewer coils and not extending postcaecally in contrast to intestinal specimens. Terminal organ 184–254 (223) by 68–92 (78), extending 85–174 (127) postacetabular, latter distance representing 9 per cent of body length or more than 2 times that in intestinal specimens. Twenty eggs measuring 19–23 (20·6) by 11–14 (12·8), averaging slightly smaller than in intestinal specimens. Excretory bladder in 1 worm 83 long.

Host : *Synaptura lusitanica* Capello, sole (Soleidae).

Locations : Small intestine, stomach.

Locality : Iture, Ghana.

Date : 21 February 1966.

Specimens : USNM Helm. Coll. No. 63374 (holotype, from small intestine) ; No. 63375–6 (paratypes, stomach and small intestine).

Discussion : We believe that the differences noted between specimens from the small intestine and stomach are due primarily, if not exclusively, to development in different locations in the host. Although the lengths of the worms from the 2 locations overlap considerably, those from the stomach do not appear to be as well developed. Manter and Pritchard (1961) noted for their new monorchiid species, *Hurleytrematoides coronatum*, that "short adult worms . . . tended to have relatively longer caeca and relatively shorter posttesticular distances." These observations do not apply to our specimens for the differences reported by us are segregated according to location in the host, not body lengths. *Lasiotocus ghanensis* appears closest to *L. malasi* (Nagaty, 1948) Yamaguti, 1954, from *Anampses* sp. (Labridae) from the Red Sea. The latter differs in body shape, in lacking a prepharynx, in having a shorter oesophagus, in the caecal bifurcation being considerably preacetabular, in the cirrus sac and terminal organ together being C-shaped, in the anterior limits of the vitellaria being acetabular, and in the excretory bladder extending to the testis. *Lasiotocus longicystis* Bartoli, 1965, found as encysted metacercariae in a variety of lamellibranch pelecypods from the Gulf of Marseille and recovered as postlarval stages from experimentally infected *Anguilla vulgaris* Turton (Anguillidae), also resembles our species, differing significantly in possessing a very long genital atrium and an excretory bladder extending to the acetabulum.

Lasiotocus glebulentus ~~sp. n.~~ Overstreet, 1971

(Figs. 13–15)

Description (based on 28 mounted specimens, 15 from Alabama including holotype and 13 from Mississippi, plus living material from Mississippi): Body fusiform, usually more pointed at posterior than at anterior end, 458 to 1,124 long by 201 to 310 at widest level (at or above midregion). Tegument spinose; spines more densely situated anteriorly, few within both suckers. Eyespots absent. Oral sucker with ventral aperture, 35 to 79 long by 58 to 102 wide. Acetabulum 60 to 102 long by 67 to 107 wide. Sucker width ratio 1:1.0 to 1.3. Forebody 119 to 275 long or 21 to 34% of body length. Prepharynx 19 to 56 long. Pharynx 26 to 40 long by 30 to 51 wide. Esophagus 23 to 63 long; both length of prepharynx and esophagus vary between ½ and 2 times length of pharynx. Intestinal bifurcation usually nearer level of acetabulum than pharynx. Ceca terminating 6 to 50% of body length from posterior end, at or beyond testicular level.

Testis usually irregularly elongate, median, and slightly diagonal; 123 to 233 long by 47 to 119 wide; with vasa efferentia from two anterior lateral margins. Posttesticular space 14 to 43% of body length. Cirrus sac arcuate, overlapping acetabulum, 180 to 393 long by 37 to 68 wide, 3 to 6 times longer than wide, length 22 to 38% of body length; containing ovoid seminal vesicle, pars prostatica, vesicular and prostatic cells, and cirrus occupying anterior 45 to 68% of sac; cirrus with thorn-shaped spines up to 12 μ long with a base up to 15 wide, usually up to 11 long by 8 wide. Genital atrium muscular, without spines, 21 to 35 long. Genital pore sinistral, near anterior edge of acetabulum.

Ovary dextral, contiguous with or somewhat separated from testis, usually postacetabular and not lobed, occasionally at acetabular level or indistinctly lobed, elongated, 44 to 170 long by 28 to 109 wide. Laurer's canal immediately adjacent to small seminal receptacle. Uterus usually filling most of available space posterior to acetabulum, joining midregion of terminal organ or slightly anteriorly. Terminal organ to left of cirrus sac, with spined or unspined basal portion and spined distal portion, 88 to 135 long by 37 to 72 wide, 2 to 3 times longer than wide, length 34 to 69% of cirrus sac; spines up to 14 long by 8 wide at the base, usually up to 10 by 9 in posterior vesicle, and 6 by 4 in anterior portion. Eggs 16 to 26 long by 9 to 12 wide in mounted specimens, 21 to 30 by 9 to 13 in living ones. Vitellaria tightly compacted in lateral groups at or near ovarian level except in single specimen with separated follicles.

Excretory vesicle elongate, usually extending anteriorly well into testicular level, containing 5 to 13 conspicuous concretions 6 to 63 μ long; pore terminal.

Type host: Mugil cephalus.

Site: Intestine.

Localities: Waters of and adjacent to Mississippi Sound, Mississippi, and Dauphin Island, Alabama.

Holotype: USNM Helm. Coll. No. 71963, paratype: No. 71964.

The name "glebulentus" refers to the abundance of lumpy concretions in the excretory vesicle.

13

14

15

FIGURES 13–15. *Lasiotocus glebulentus*. **13.** Holotype, ventral view. **14.** Dorsal view to show cirrus sac and excretory vesicle. **15.** Ovarian complex drawn freehand from living specimen showing seminal receptacle at base of oviduct.

DISCUSSION

Lasiotocus glebulentus can apparently be differentiated from all other species of *Lasiotocus* Looss, 1907, by the several conspicuous concretions in the excretory vesicle. A single conspicuous concretion was present in the vesicles of all but two of 42 reexamined specimens of *L. trachinoti* Overstreet and Brown, 1970. The present trematode is unusual in having tightly compacted vitellaria and a genital pore to the left of the midline. Most of the numerous species of *Lasiotocus* have a medially located pore, but in a few it may be either medial or submedial, depending on preparation of the material or biological variation.

Species with a submedial genital pore differ from *L. glebulentus* in characters other than the excretory concretions. The pore is to the right in *L. odhneri* (Srivastava, H. D., 1939) Yamaguti, 1954, a species with a sucker width ratio of about 1:0.7 and the terminal organ shaped in an inverted U anterior to the cirrus sac. In both *L. minutus* (Manter, 1931) Thomas, 1959, and *L. elongatus* (Manter, 1931) Thomas, 1959 the genital pore is slightly left of the midline of the acetabulum. The descriptions of both worms are incomplete, but *L. minutus* has an oral sucker larger than the acetabulum and *L. elongatus* has the testis overlapping the ovary, no prepharynx, and slightly separated vitelline follicles. Sogandares-Bernal and Hutton (1959) reported egg sizes of and illustrated a specimen they believed to be *L. minutus*. In *L. mugilis* Overstreet, 1969, from the same host at Biscayne Bay, Florida, the genital pore is either medial or submedial, the oral sucker is weakly developed, the ceca consistently extend to near the posterior end of the body, and the eggs are typically smaller, even though overlapping in size with those of *L. glebulentus*.

The largest mounted paratype and four large solitary *L. glebulentus* examined alive on 22 February 1971 were devoid of spines in the posterior vesicle and in the proximal portion of the anterior part of the terminal organ. Bartoli (1965) noted a similar condition in *L. longicystis* where the metacercaria but not the postlarval stage had a spined posterior vesicle and Fischthal and Thomas (1969) reported that some specimens of *L. cynoglossi* and apparently other species had a spined posterior vesicle while others did not. The taxonomic significance of the presence or absence of the spines is questionable.

Lasiotocus **haemuli** sp. n.
Figure 30

Hosts: *Haemulon plumieri* (2 of 5), type host; *Haemulon sciurus* (2 of 6).
Site: Intestine and pyloric caeca.
Holotype: U. S. N. M. Helm. Coll. No. 71312, paratype: No. 71373.

Description (based on 18 specimens): Body elongate, 0.49 to 0.93 long by 0.16 to 0.22 wide, usually widest at midbody; posterior end pointed or rounded; usually a constriction immediately posterior to level of oral sucker. Cuticle completely spinose. Eyespots absent. Oral sucker terminal, funnel-shaped, 0.11 to 0.17 long by 0.10 to 0.15 wide. Acetabulum weakly developed, 0.05 to 0.06 long by 0.05 to 0.07 wide. Sucker ratio 1:0.4 to 0.6. Forebody 29 to 48% of body length. Prepharynx shorter than pharynx. Esophagus usually shorter than pharynx. Intestinal bifurcation a short distance anterior to acetabulum. Caeca terminating beyond middle of posttesticular space.

Testis slightly irregular, 0.07 to 0.13 long by 0.05 to 0.10 wide. Posttesticular space 17 to 35% of body length. Cirrus sac arcuate, 0.11 to 0.18 long by 0.03 to 0.05 wide, extending around left or dorsal of acetabulum to or near ovarian level; containing large ovoid seminal vesicle, prostatic cells, saccate cells opening into pars prostatica, cirrus with thorn-shaped spines 4 to 5 microns long. Genital atrium short, unspined. Genital pore anterior to acetabulum, sometimes ventral to intestinal bifurcation.

Ovary varying from slightly irregular to triangular, never dextral, and occasionally sinistral to median line through testis, 0.05 to 0.10 long by 0.05 to 0.09 wide. Seminal receptacle absent. Vitelline follicles in lateral groups, 8 to 10 on each side, between levels of acetabulum and ovary. Terminal organ 0.05 to 0.10 long by 0.03 to 0.05 wide, 30 to 90% length of the cirrus sac; proximal vesicle unspined; anterior portion with spines 5 microns long. Uterus may or may not extend past caecal termination, entering terminal organ at junction of spiny and unspined portions. Eggs 17 to 24 by 11 to 13 microns.

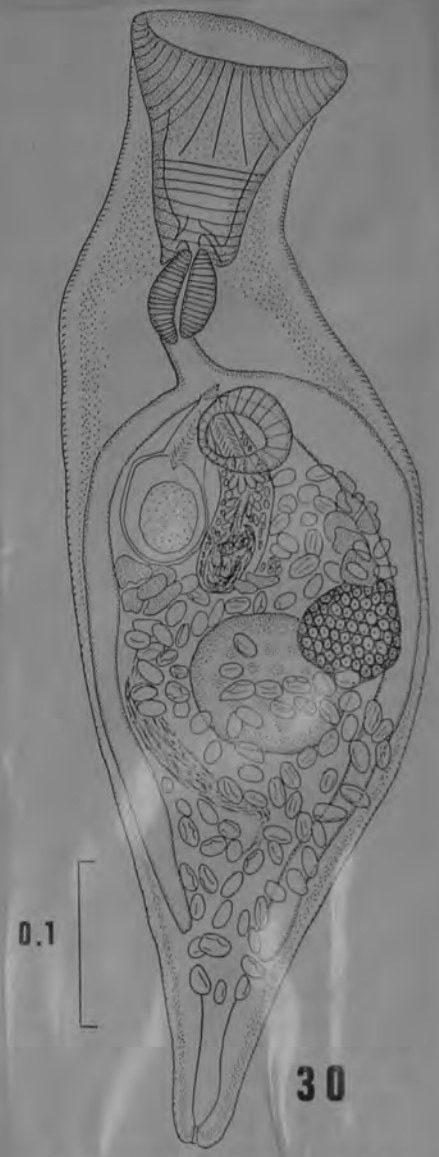


Figure 30. *Lasiotocus haemuli*, holotype, ventral view.

Excretory vesicle short, usually extending to level of caecal termination; pore terminal.

Discussion: *Lasiotocus haemuli* is found with *L. truncatus* and resembles that species but differs from it by having a larger sucker ratio, a non-dextrally located ovary, and a larger pharynx compared with the width of the neck. *Lasiotocus haemuli* differs from *L. longovatus* in the arrangement of the gonads and size and shape of eggs. *Lasiotocus beauforti* and *L. longicaecum* differ from *L. haemuli* in that they are longer; also, *L. beauforti* has a longer genital atrium and *L. longicaecum* has longer caeca and a different position of the cirrus sac. *Lasiotocus pritchardae* (Nahhas and Cable, 1964) is a larger species with a distinctly lobed, dextrally located ovary.

Lasiotocus lintoni (Manter, 1931) Thomas, 1959

Synonymy: *Proctotrema lintoni* Manter, 1931; *Genolopa lintoni* (Manter) Hopkins, 1941.

Hosts: **Lagodon rhomboides* (L.); fam. Sparidae; in 1 of 29; *Orthopristis chrysoptera* (L.); fam. Pomadasyidae; in 5 of 12.

Site: Intestine.

Deposited specimens: USNM Helm. Coll. No. 60091.

Discussion: Both *Lasiotocus beaufort* and *L. lintoni* are herein reported for the first time from the northern Gulf, adding two more species of trematodes common to the northern Gulf of Mexico and Beaufort, North Carolina.

From Nahhas and Powell, 1965

Lasiotocus (Manter, 1931) → Thomas, 1959

9. **Proctotrema lintoni** n.sp. (Figs. 4 and 5).

Synonym: *Monostomum* sp. Linton 1905, p. 379.

Hosts: *Orthopristis chrysopterus*, hogfish; *Menidia menidia*, silversides.

Position: intestine. Frequency: one from nineteen hogfish; one from eighteen silversides.

These two specimens were finally referred to the same species although there are certain slight differences. Both specimens seemed to be somewhat macerated and only a few spines could be seen. Spines are probably normally present. Fig. 4 is of the specimen from silversides. The other specimen (from hogfish) is similar except for an oral sucker even more drawn out posteriorly, and a three-lobed ovary.

Body elongate, tapering almost to a point posteriorly, broadest anteriorly, 1·1 mm. in length and 0·45 mm. greatest width. Oral sucker elongated posteriorly, about twice the size of the ventral sucker (diameters 144 and 86μ respectively). Genital pore median, just anterior to the ventral sucker. Pharynx small, almost spherical; oesophagus short; caeca not reaching the posterior end by a short distance. Testis single, median, spherical. Cirrus sac large, extending some distance posterior to ventral sucker; cirrus spined, prostate cells conspicuous, spherical seminal vesicle in base of cirrus sac. Ovary anterior and to the right of testis. Vitelline glands in two lateral groups of about eight follicles each, posterior to ventral sucker. A small seminal receptacle seems to be present. Uterus fills posterior part of body. Eggs about 24 × 10μ (according to Linton three times longer than wide).

The shape of the eggs readily distinguishes this species from *Proctotrema bacilliovatum* Odhner 1911.

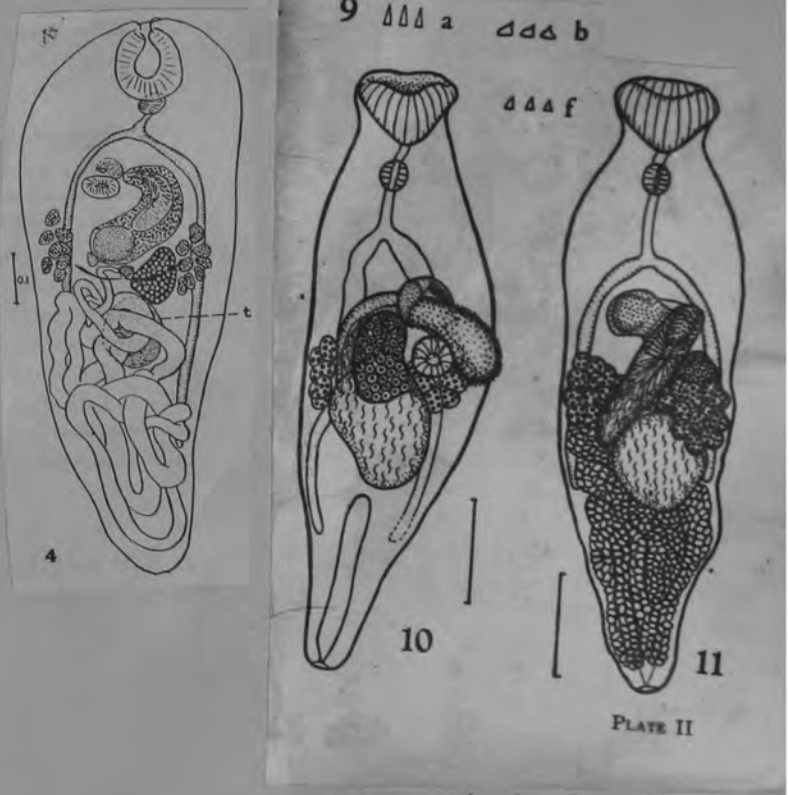


PLATE II

from Hopkins 1991

Genolopa lintoni (Manter, 1931)

Forty-one specimens, from 5 of the 6 pigfish (*Orthopristis chrysopterus*) examined, were referred to this species. They varied from a length of 1.0 mm to 1.7 mm. The ventral sucker in my specimens is slightly more than half the diameter of the oral sucker, the pharynx is 0.05 to 0.07 mm long and 0.05 to 0.06 mm wide, the esophagus is nearly as long or longer than the pharynx, and the ceca extend to the posterior half of the testis or slightly beyond. Other characteristic features are shown in Figs. 10, 11, 3e and 9e, h. No seminal receptacle was seen, but it may nevertheless be present, as the arrangement of organs would make it very difficult to see this structure if present. The eggs average about 23 by 13 μ. The most striking feature of this species is the comparatively large size of the rose-thorn shaped cirrus spines (25 μ long) and the long spike-shaped spines of the metraterm (25–30 μ long); the spines of the external body covering, however, are of the same size as those in *Genolopa beauforti* (10 μ long).

Manter was evidently mistaken in saying that the "Monostomum sp." of Linton, 1905, p. 379, is a synonym of *G. lintoni*. Apparently the species referred to is the one shown in Linton's Fig. 223, for Manter quotes Linton's statement that the eggs are three times longer than wide. I have found numerous specimens of the species shown in Linton's Fig. 223, and they are very different from *G. lintoni*, as will be seen from the following description.

From Hopkins 1941

Lasiotocus lintoni (Manter, 1931)
Thomas, 1959

Synonyms: *Proctotrema lintoni* Manter, 1931
Genolopa lintoni (Manter, 1931)
Hopkins, 1941

Host: *Orthopristis chrysopterus*
Site: Intestine
Locality: Santa Rosa Island, Pensacola Bay, Florida

From Nahhas and Powell, 1971

Lasiotocus

Thomas 859 Monorchidae

Proctotrema longicaecum, ~~new species~~ (MANTER, 1947)
(Plate 44, figs. 87-89)

Host: *Anisotremus interruptus* (Gill)
Location: Intestine
Locality: James Island, Galapagos
Number: 2 specimens in one of 3 hosts examined

The following specific diagnosis is based on 2 specimens from the above locality and one specimen from *Anisotremus virginicus* (Linn.) from Tortugas, Florida. Specimens from both regions are figured (figs. 87 and 89), and differences are discussed below.

SPECIFIC DIAGNOSIS OF PROCTOTREMA LONGICAECUM

Body spined, elongate, 1.5 to 1.781 by 0.292 to 0.357, anterior end truncate, posterior end tapering slightly and rounded. Oral sucker terminal, funnel shaped, longer than wide, length 0.240 to 0.314, width 0.202 to 0.272. Acetabulum about ⅓ body length from anterior end, 0.107 to 0.126 in diameter or about half the transverse diameter of oral sucker. Prepharynx present, almost as long as pharynx, pharynx well developed, 0.117 to 0.130 long by 0.080 to 0.118 wide; esophagus not quite so long as pharynx; ceca extending to near posterior end of body. Genital pore median or submedian, a very short distance anterior to acetabulum. Testis large, ovoid, intercecal, directly posterior to midbody. (Two vasa efferentia could be seen arising from the anterior end of the testis in one specimen.) Cirrus sac elongate, curving around the right side of acetabulum or overlapping the right half of acetabulum, extending to the anterior edge of the ovary or even past the ovary to the anterior edge of the testis; containing a long-spined cirrus, pars prostatica, prostate gland, and, in its basal third, the ovoid seminal vesicle. Spines in the cirrus are of one type. Ovary ovoid, unlobed, immediately anterior to testis, to the right. Seminal receptacle, if present, rudimentary. Vitellaria of 9 large, distinct follicles on each side, lateral, just posterior to midbody at ovariotesticular level. Uterus chiefly intercecal, filling most of hindbody, entering the middle region of the metraterm sac. Metraterm sac elongate oval, to the left, extending a short distance posterior to the acetabulum, containing a large spherical vesicle in its base and an anterior spiny region. What seems to be a muscular terminal region is probably the genital atrium but is not demarked from the metraterm. Eggs 18 to 20 by 9 to 11 μ. The excretory system could not be made out.

Comparisons. This species is probably most closely related to *Proctotrema truncata* (Linton, 1910) n. comb.[1] (Synonym: *Genolopa truncata* Linton), but is clearly distinct in the following characters: more elongate body, much longer ceca, more slender cirrus sac, smaller ovary, more posterior vitellaria, larger acetabulum, and slightly larger eggs. *P. longicaecum* differs from *P. bacilliovatum* Odhner, 1911 in shape of eggs as well as in other characters; from *P. lintoni* Manter, 1931 in body form, size of oral sucker, extent of ceca, more posterior vitellaria, more slender cirrus sac, and shorter eggs. It differs from *P. plectorhynchi* Yamaguti, 1934 in shape of ovary, length of ceca, more slender cirrus sac, and smaller eggs. It differs from *P. macrorchis* Yamaguti, 1934 in longer ceca, shape and position of ovary, and smaller eggs.

[1] The removal of *Genolopa truncata* from the genus Genolopa leaves *Genolopa ampullacea,* the type species, still in the genus which is at least for the present recognized as distinct from Proctotrema.

FROM: ALLAN HANCOCK PACIFIC EXPEDITIONS, VOL. 2, 1947

Yam., 1954

Lasiotocus longicaecum (Manter 1940) (Fig. 5) Thomas, 1959

Two specimens of *L. longicaecum* recovered from *Lethrinus atlanticus* C. & V. near Accra during the present investigation are almost identical with the 3 specimens described by Manter (1940) from *Anisotrema interruptus* (Gill) and *A. virginicus* (L.) found near the coast of Florida and the Galapagos Islands except for minor differences in the sizes of the oral suckers. In view of the unknown variability of this species these differences are considered inadequate to justify the erection of a new species.

Nagaty (1948) claims that *L. beauforti* is a synonym of *L. longicaecum* but as *L. longicaecum* has a much shorter genital atrium and a longer excretory bladder than *L. beauforti* this is considered unlikely. Unfortunately Manter's description of the excretory system and certain other anatomical features is incomplete. Consequently a more complete description based on present specimens is given below.

Diagnosis: Body oval or more elongated; extremities almost truncate; 1.4 to 1.7 long; 0.46 to 0.47 broad at widest point in region of vitelline glands. Body surface covered with small, backwardly directed spines. Oral sucker sub-terminal, funnel shaped, 0.21 to 0.23 by 0.17 to 0.20. Ventral sucker in anterior half of body, separated from oral sucker by distance varying from 0.25 to 0.32; almost spherical, 0.12 to 0.14 by 0.12, appreciably smaller than oral sucker. Ratio of oral to ventral sucker 1.50 : 1 to 1.75 : 1. Oral opening antero-ventral, opening into short prepharynx. Pharynx oval; 0.065 by 0.05 to 0.10 by 0.10. Esophagus short. Gut-ceca long; postero-laterally directed, terminating a short distance from posterior extremity. Excretory pore terminal, posteriorly. Excretory bladder tubular, reaching almost to ventral-sucker before bifurcating. Genital pore median, immediately preacetabular. Genital atrium short, oval. Testis single, median, with longitudinal axis diagonally placed; 0.23 to 0.24 by 0.12 to 0.15. Vas deferens short. Cirrus pouch large, up to 0.46 by 0.10, with spherical vesicula-seminalis, short tubular pars-prostatica, armed cirrus with large elongated spines, and prostatic cells. Ovary to left of mid-line, lateral to anterior margin of testis, compact, oval, 0.10 to 0.12 by 0.07 to 0.11. Ootype and Mehlis's gland median at ovarian level. Laurer's canal short, running antero-laterally from a slightly swollen portion of oviduct and opening dorsally near base of cirrus pouch; swollen portion of oviduct may represent vestigial receptaculum-seminis. Uterus emerges ventrally from ootype; proximal region acts as a receptaculum-seminis-uterinus; descending and ascending limbs of uterus fill most of post-ovarian space. Terminal organ of uterus well developed, consisting of proximal, almost spherical region with sperms and a terminal spined portion. Uterine spines approximately twice the length of cirrus spines. Uterus enters proximal region of distal chamber. Eggs oval; 0.015 to 0.020 by 0.0125 to 0.015. Vitelline follicles situated in 2 lateral groups at testiculo-ovarian level, overlapping gut-ceca. Transverse yolk duct at ovarian or pre-ovarian level giving rise to median, dorsally directed yolk duct.

from Thomas, 1959

Renamed Lasiotocus accraensis
by Fischthal & Thomas,
1969

Lasiotocus longicaecum (Manter, 1940)
Yamaguti, 1953

Synonym: Proctotrema longicaecum Manter, 1940.

Host: Anisotremus virginicus (J).

Site: ceca and intestine. JAMAICA

FROM NAHHAS AND CABLE (1964)

Lasiotocus longicaecum (Manter, 1940)
Yamaguti, 1954

Proctotrema longicaecum Manter, 1940.

Host: Anisotremus virginicus (3 of 6).

Site: Rectum.

From: Overstreet, 1969

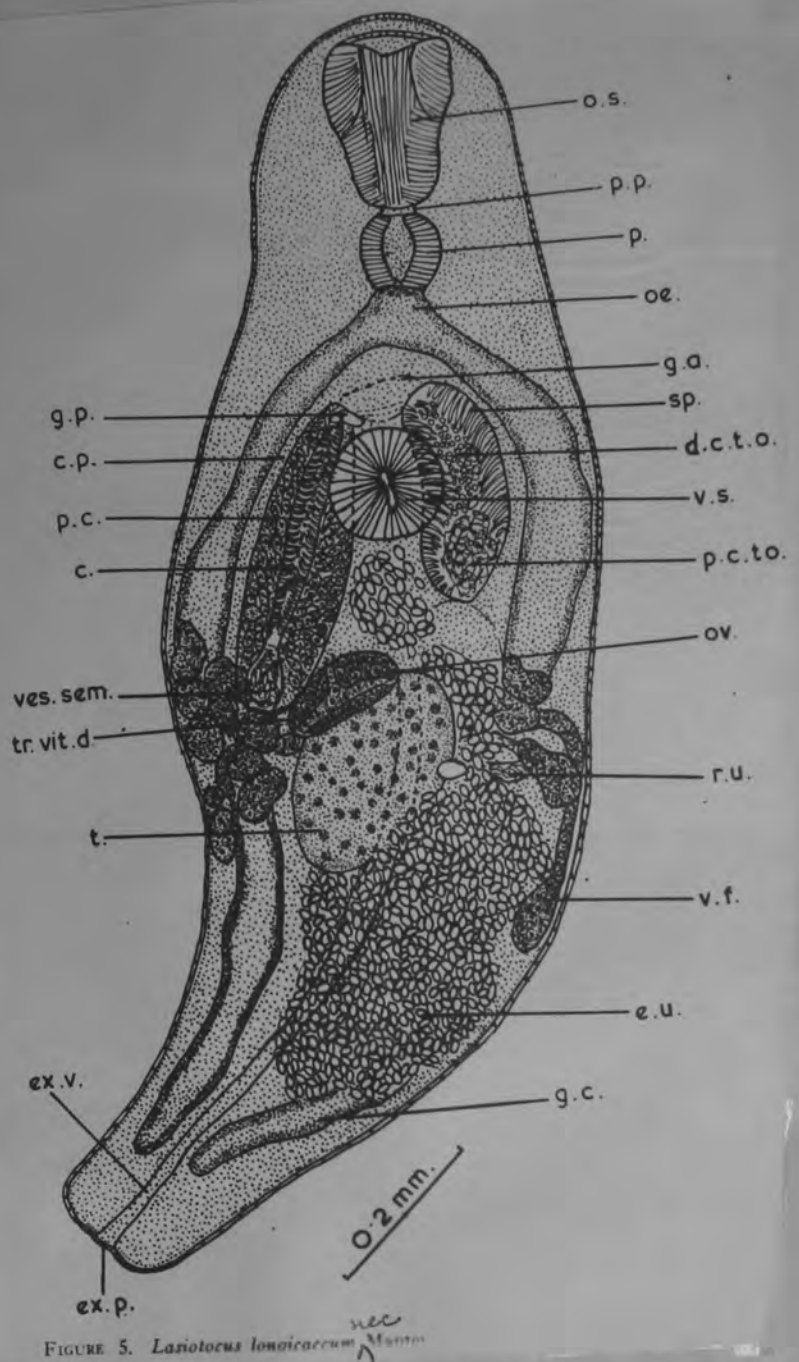


FIGURE 5. *Lasiotocus longicaecum* nec Manter

renamd : *L. accraensis*

25. *Lasiotocus longicaecum* (Manter, 1940).

Hospedador: *Balistes polylepis* (Steindachner).
Localización: intestino.
Distribución geográfica: Bahía Santa Inés, Baja California, México.

Los representantes de esta especie en la presente colección son idénticos a los descritos por Manter (1940).

From:- Arai, H.P., 1962.

Monorchiidae

Lasiotocus longicystis Bartoli, 1965

DESCRIPTION.

Le kyste : sphérique et transparent ; sa paroi, faiblement résistante, est peu épaisse (25-30 µ).

La taille de la métacercaire est très variable ; au cours de son accroissement nous assistons au développement progressif des organes génitaux jusqu'à l'apparition des follicules vitellins. L'évolution de cet appareil génital semble s'arrêter une fois ce stade atteint ; en effet, je n'ai jamais rencontré de métacercaires davantage différenciées. D'ailleurs, quand sa taille devient trop importante, le corps de la larve s'opacifie jusqu'à ce que l'on ne puisse même plus y discerner les grandes lignes de l'appareil génital ; ensuite la métacercaire meurt.

Dans la description qui suit, seules seront considérées les métacercaires très évoluées.

Corps : il est allongé et lancéolé (Fig. 1), mesurant 576-840 µ de longueur sur 280-416 µ de largeur ; cette dernière atteint son maximum au niveau de la ventouse ventrale. La cuticule est couverte d'épines disposées en quinconce, nombreuses et fortes dans la région antérieure. La spinulation va en s'amenuisant progressivement jusqu'à disparaître dans la région postérieure.

Glandes céphaliques : elles sont bien développées et s'étendent vers l'arrière jusqu'au niveau de la ventouse ventrale (Fig. 2).

Système nerveux : sur une préparation favorable, j'ai pu observer les masses ganglionnaires et les nerfs qui s'en échappent ; le nerf postéro-médian est le plus important.

Taches oculaires : au nombre de deux, elles sont asymétriques, latéralement disposées par rapport au pharynx ; elles sont constamment présentes. De chaque côté, les grains de pigment peuvent être condensés en une masse unique ou dispersés sur une aire plus ou moins restreinte.

Ventouses : la ventouse orale est ventrale et subterminale ; en général circulaire, elle peut être parfois légèrement plus large que longue ; son diamètre varie entre 106 µ et 151 µ.

La ventouse ventrale est à cheval sur les tiers antérieur et médian, presque entièrement contenue dans ce dernier. Sa partie interne est dépourvue d'épines et ornementée de quelques verrues. Son diamètre est compris entre 100 µ et 135 µ.

Le rapport ventousaire VO/VV oscille entre 1 et 1,19.

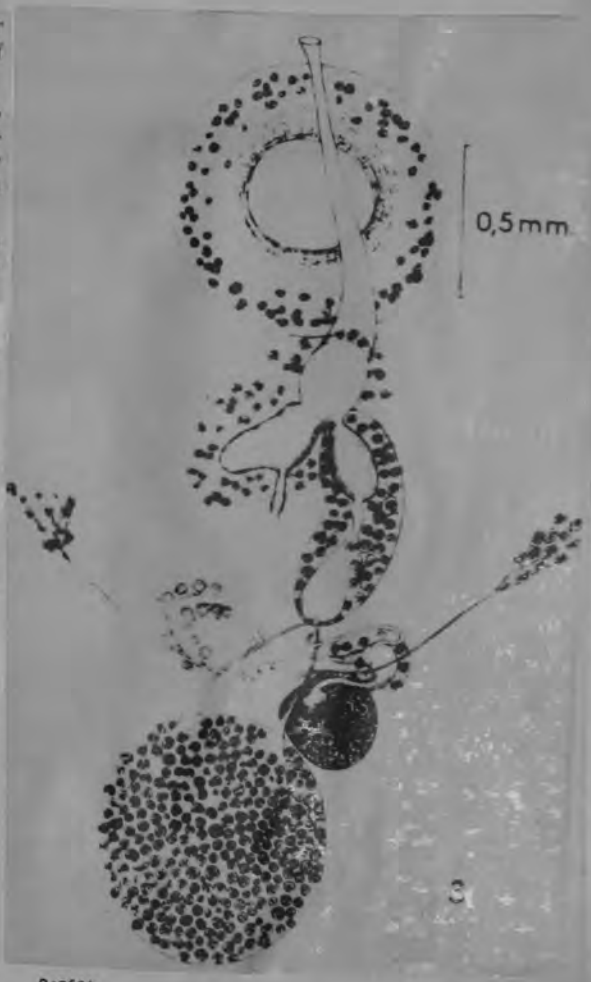
Appareil digestif : le prépharynx est présent chez tous les individus mais il est peu développé ; cependant, il atteint parfois la moitié de la longueur du pharynx. Ce dernier est globuleux ; son diamètre varie entre 35 µ et 56 µ.

La longueur de l'œsophage est égale ou même largement supérieure à celle du pharynx. Les cœcums, non terminaux, s'arrêtent dans le dernier cinquième de la longueur du corps.

Appareil génital (Fig. 3).

a. *Appareil génital mâle :* il n'y a qu'un seul testicule ; il est localisé vers le milieu de la distance comprise entre la ventouse ventrale et l'extrémité postérieure du corps ; son diamètre varie entre 70 µ et 100 µ. Les deux spermiductes aboutissent au même point, à la base de la poche du cirre. Cette dernière, longue de 100 µ à 160 µ, est composée d'une vésicule séminale dans sa partie proximale communiquant avec le cirre par l'intermédiaire d'un canalicule, future *pars prostatica*. Ces formations sont entourées de cellules à cytoplasme granuleux, toutes semblables.

b. *Appareil génital femelle :* l'ovaire est contigu au testicule, en avant et à droite de celui-ci. De forme arrondie, il mesure de 30 µ à 50 µ de diamètre. La partie initiale de l'oviducte est revêtue d'un épithélium à cils vibratiles, ces derniers étant orientés vers la région distale. Le canal de Laurer et le réceptacle séminal sont présents.



-OVER-

En arrière de ce dernier, l'oviducte est de nouveau cilié sur une faible longueur ; la ciliature est orientée en sens inverse de la précédente. En arrière de ces formations débouche le canal issu du réceptacle vitellin. Les vitelloductes ont une orientation sensiblement transversale. Les follicules vitellins sont nettement ébauchés ; ils occupent une position dorsale et extra-cæcale, au milieu de l'espace compris entre l'arrière de l'acétabulum et la partie antérieure du testicule. Après avoir décrit une boucle, l'utérus débouche dans l'organe terminal, au milieu de la longueur de celui-ci. L'ensemble de l'organe terminal, comme d'ailleurs une partie de l'atrium génital, est environné d'un manchon cellulaire assez volumineux, sans membrane limitante.

La surface du cirre, celle de la partie extrême de l'utérus et celle de la quasi totalité de l'organe terminal sont tapissées de cils assez longs mais non vibratiles. *In vivo*, on distingue très nettement leurs ondulations sous l'effet des mouvements du liquide remplissant ces cavités.

c. *Atrium génital* : sa longueur est assez importante puisqu'elle dépasse parfois celle de l'acétabulum. Il semble constitué de deux parties distinctes. La chambre proximale est courte et turgescente ; on y observe souvent mais pas toujours des cils identiques à ceux revêtant les cavités de l'organe terminal et du cirre. La chambre distale, longue et effilée, est parfois très difficile à observer ; elle s'ouvre à l'extérieur par le pore génital situé ventralement et en avant de l'acétabulum.

Appareil excréteur : (Fig. 4) ; il est du type mésostome. Ses huit paires de cellules à flamme vibratile sont disposées entre elles selon la formule : $2^{1}[(2+2)+(2+2)] = 16$. Les canaux collecteurs antérieur et postérieur fusionnent entre eux dans la région pré-acétabulaire. Les troncs collecteurs principaux s'abouchent dans la vessie au niveau de la zone post-testiculaire ; celui de droite y débouche plus en arrière que celui de gauche.

La vessie est énormément développée ; elle occupe une position dorsale sur la presque totalité de son parcours sauf dans la région anté-acétabulaire où elle acquiert une direction dorso-ventrale. Sur l'animal vivant, elle présente une courbure caractéristique, en arrière et à droite de la ventouse ventrale ; l'extrémité antérieure apparaît alors à gauche de l'acétabulum. Sur l'animal fixé, la vessie prend une allure générale plus rectiligne ; son extrémité antérieure dépasse alors largement la ventouse ventrale jusqu'à atteindre le point de bifurcation des cæcums. Son diamètre est relativement constant sur toute sa longueur sauf au niveau de sa partie postérieure où elle se renfle en une ampoule de 60 µ à 120 µ de largeur. L'épaisseur de l'épithélium vésical est généralement importante mais irrégulière ; il présente des sortes de villosités capables de se détacher, restant alors en suspension dans le liquide d'excrétion.

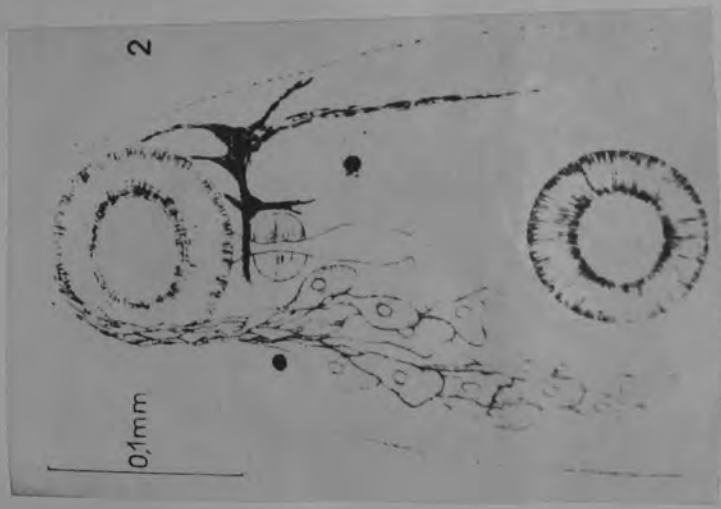
Le pore urinaire est en position très légèrement dorsale.

ALSO A FEW FEEDING EXPERIMENTS RECORDED.

FROM BARTOLI (1965)

POST-LARVA OF 13 DAYS. DORSAL.

DORSAL. NOTE SHAPE OF EXCRETORY VESICLE.



DORSAL. SHOWING CEPHALIC GLANDS & NERVOUS SYSTEM. NOTE LENGTH OF PHARYNX, OESOPHAGUS, AND ASYMMETRY OF EYE SPOTS.

Monorchiidae

Durio & Manter, 1968

Lasiotocus longitestis n. sp. (Fig. 10)

HOST: *Plectorhynchus* sp.; Lutjanidae; "loche castex."

LOCATION: Intestine.

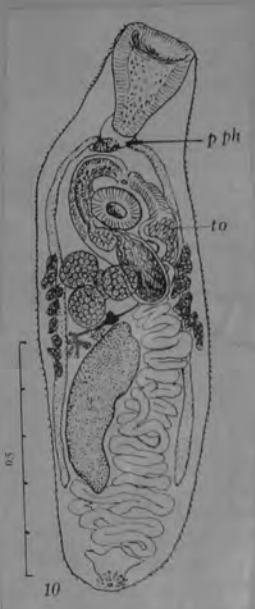
NUMBER: One.

HOLOTYPE: USNM Helm. Coll. No. 63306.

DESCRIPTION: Body truncate at anterior end; broadly rounded posteriorly. Length 1.253; width 0.365. Oral sucker funnel-shaped, 0.246 long by 0.176 wide. Forebody 0.348 long, contracted. Acetabulum 0.115 wide (0.070 long); sucker ratio 1 : 0.65. Prepharynx wide; pharynx about 0.056 long by 0.040 wide; esophagus probably about same length as pharynx; ceca extending to 0.214 from posterior end of body. Testis elongate, 0.342 by 0.128 greatest width, in posterior half of body, toward right side of body, more or less pointed at posterior end; posterior end near level of cecal ends. Cirrus sac large, bending around right side of acetabulum, base near midbody; containing saclike seminal vesicle, prostatic vesicle, and cirrus armed with broad-based spines. Genital atrium unspined; genital pore median.

Ovary deeply four-lobed; lobes spherical and connected only by narrow stalks; to right of midline; immediately anterior to testis. Seminal receptacle not observed. Vitellaria lateral at ovarian level, cecal and extracecal; seven to nine follicles on each side. Mehlis' gland and yolk reservoir posterior to ovary; uterus coiling to left of testis, extending nearly to posterior end of body, entering terminal organ near middle. Terminal organ 0.182 long by 0.080 greatest width, curving around left side of acetabulum; basal half unspined, filled with eggs; anterior half armed with slender spines. Eggs thin-shelled, collapsed, 24–28 by 14–15 μ. Excretory pore ventroterminal, glandular; excretory vesicle apparently short and wide.

DISCUSSION: This species is most similar to *L. plectorhynchi* (Yamaguti, 1934) Yamaguti, 1954 from a related host in Japan. *Lasiotocus* **longitestis** differs in its longer, more narrow testis reaching to within less than one-fourth body length of posterior end of body, as do the ceca; its cirrus sac relatively considerably longer; and four- rather than three-lobed ovary. *Lasiotocus himezi* Yamaguti, 1951, has a four-lobed ovary and a fairly long testis but it has a much longer esophagus, less elongate oral sucker, and longer posttesticular space. In *L. macrorchis* (Yamaguti, 1934) Yamaguti, 1954, the posttesticular space is almost half body length.



Lasiotocus Thomas 1959

Prodistomum

Genolopa longovatum n. sp. Hopkins, 1941

(See Figs. 12, 3c, 9c)

Length usually between 0.5 and 1.0 mm but sometimes slightly exceeding these limits. Body urn-shaped, broadest in middle, tapering toward both ends but expanding again at the anterior end around the large oral sucker. Cuticular spines covering entire body. Oral sucker slightly more than twice diameter of ventral sucker (oral sucker in type 0.12 by 0.15 mm, ventral sucker 0.05 by 0.06 mm). Pharynx nearly spherical, about two-thirds diameter of ventral sucker. Prepharynx very short, seldom visible in whole mounts. Esophagus slightly longer than pharynx. Intestinal ceca ending about half-way between testis and posterior end. Single testis very close behind ventral sucker, sometimes partly dorsal to it, so that cirrus pouch is crowded forward and seldom extends posterior to ventral sucker. Cirrus and distal portion of metraterm pouch spiny; spines of cirrus wedge-shaped, nearly in form of equilateral triangle, about 8 μ long; spines of metraterm very narrow and needle-like (Fig. 9c). Ovary on right side of ventral sucker, overlapping anterior end of testis, slightly trilobate to almost spherical. Vitellaria consisting of compact groups of 8 to 10 follicles close to dorsal surface on each side of ventral sucker and anterior end of testis. Coils of uterus filling intercecal space from ovary to posterior end, slightly overlapping intestinal ceca and edges of testis. Eggs elongate, averaging 26 by 11 μ, and in living specimens often 2½ times as long as wide (Fig. 3c). Excretory bladder undivided, pouch-shaped.

12

00 c

ΔΔΔ c

Host: Pigfish (*Orthopristis chrysopterus*).
Location: Intestine.
Locality: Beaufort, N. C.
Type specimen: U. S. Nat. Mus. Helm. Coll. No. 26780.

The most distinctive features of this species in life are the urn-like shape, the very elongate eggs, and the almost funnel-like form of the oral sucker. The flame cells and excretory tubules were seen only once; the flame cell formula appeared to be 2[(2+2)+(2+2)], but this cannot be stated as a fact until more observations can be made. *G. longovatum* is distinguished from all other species except *G. bacilliovatum* (Odhner, 1911) and *G. costaricae* (Manter, 1940) by the elongate form of the eggs, which are however not as long as those of Odhner's species. *G. longovatum* differs from *G. bacilliovatum* in having a much greater difference in the relative sizes of the two suckers and in having a less distinctly lobed ovary, as well as in having shorter eggs (26 μ as compared with 31–33 μ) and shorter cirrus spines (8 μ compared with 35 μ). *G. longovatum* has longer ceca than *G. costaricae*, and differs also in body shape. This is almost certainly the same species as the specimen shown in Fig. 223 of Linton (1910) under the name of "*Monostomum* sp." *G. longovatum* occurred in the intestines of all of the six pigfish (*Orthopristis chrysopterus*) examined at Beaufort; a total of 54 specimens was collected.

-OVER-

Lasiotocus longovatus (Hopkins, 1941) Thomas, 1959

Synonyms: Genolopa longovatum Hopkins, 1941; *Proctotrema longovatum* (Hopkins) Manter, 1942.

Hosts: **Bathystoma aurolineatum* (J); **Haemulon bonariense* (J); **H. flavolineatum* (C); **H. sciurus* (J). JAMAICA CURAÇAO

Site: ceca and intestine.

Seventy trematodes are referred to this species on the basis of egg size and other measurements, length of ceca and general topography of organs. We did not observe the urn-shape described by Hopkins (1941) in either living or mounted specimens. However, Hopkins states (p. 401) "This is almost certainly the same species as the specimen shown in Figure 223 of Linton (1910) under the name '*Monostomum* sp.'." Obviously, he was referring to Linton (1905) since Figure 223 of Linton's 1910 paper represents a bucephalid. Our material is very similar to Linton's in the shape of the body and oral sucker.

FROM NAHHAS AND CABLE (1964)

Lasiotocus longovatus
(Hopkins, 1941) Thomas, 1959

Genolopa longovatum Hopkins, 1941.
Proctotrema longovatum (Hopkins, 1941) Manter, 1942.

Hosts: Anisotremus virginicus (2 of 6)*; *Haemulon aurolineatum* (1 of 7); *Haemulon parrai* (1 of 7)*; *Haemulon sciurus* (2 of 6); *Orthopristis chrysopterus* (3 of 4).

Site: Pyloric caeca and intestine.

Discussion: There is considerable variation in this species. The caeca may end at the testicular level rather than somewhat past it, the testis may be well removed from the acetabulum, and the cirrus sac often extends beyond the acetabulum. The body is characteristically urn-shaped as originally described but exceptions occur (Nahhas and Cable, 1964:201).

Whether various species of monorchiids should be in the genus *Proctotrema* or *Lasiotocus* has been discussed by Manter and Pritchard (1961:483-484) and Nahhas and Cable (1964:200). I am following Bartoli and Prévot (1966:406) who transferred to the genus *Lasiotocus* all species previously referred to as *Proctotrema* except *P. bacilliovatum.*

FROM: Overstreet, 1969

Lasiotocus malasi (Nagaty,1948) Thomas,1959

Syn.: Proctotrema malasi

MONORCHIDAE

Proctotrema malasi n. sp. Nagaty, 1948
(Fig. 1)

The material upon which this description is based consists of 58 specimens obtained from *Anampses* sp. locally called "Malas." This trematode is small and lanceolate in shape and its size is fairly constant. It measures 0.86 to 1.135 mm in length, and 0.383 to 0.449 mm in maximum breadth about the middle of the body. The cuticle is provided with comparatively thin and long spines. The ventral sucker is slightly smaller than the oral, measuring 0.117 to 0.135 mm in diameter, and is situated slightly anterior to the middle of the body.

The digestive system: The oral sucker is rounded or slightly broader than long, measuring 0.122 to 0.157 mm in diameter. There is a well-developed pharynx which is more or less rounded or slightly longer than broad, measuring 0.068 mm in diameter. There is no pre-pharynx, but a short oesophagus is present. The two simple intestinal caeca do not quite reach the posterior end of the trematode, and are often beaded in their course due to the collapse of the intestinal lumen in some parts.

The male genitalia: The single testis is spheroid, measuring 0.135 to 0.180 mm in diameter and is situated medially between the intestinal caeca at the junction of the middle and posterior thirds of the body. The cirrus sac is long and is bent alongside the anterior and right borders of the ventral sucker which it partly overlaps dorsally. It measures 0.203 to 0.338 mm in length,

almost reaching the anterior border of the testis, forming together with the metraterm pouch a large C-shaped structure. It is provided at its distal half with conical spines about 0.013 mm in length.

The female genitalia: The ovary is spheroid, antero-lateral to the testis and in close contact with it towards the right side. It measures 0.68 to 0.9 mm in diameter. No receptaculum seminis could be detected. The vitelline glands occupy a restricted area, more extracaecal in position roughly between the levels of the posterior borders of the ventral sucker and that of the ovary. The vitelline follicles are more or less rounded, comparatively large, ranging from 8 to 14 in number on each side. There is a congested transverse vitelline duct connecting the two sides of the glands with the oviduct. The uterus reaches the posterior end on both sides of the testis and may occupy practically the whole area posterior to the ventral sucker. Ova are golden-yellowish in color, small, measuring 0.023 × 0.014 mm in diameter. The metraterm pouch is found anterior and towards the left lateral side of the ventral sucker, measuring 0.158 to 0.225 mm in length. Its distal half is provided with long and slender spines which measure about 0.02 mm in length. A comparatively large genital atrium is situated medially anterior to the union of cirrus sac and metraterm pouch, between the two intestinal caeca. It possesses no spines, a character which refers this species to the genus *Proctotrema*. Sometimes this atrium is displaced from its normal position by being folded back on the distal ends of the cirrus sac and metraterm pouch. It opens to the outside through a common genital pore.

The nearest species to *P. malasi* is *P. minutum* (Manter, 1931) Manter, 1942. The new species differs from Manter's mainly in the following characters: The former species is lanceolate and is more than twice the size of the latter, which is oval. Oral and ventral suckers of the former are about three times the diameter of the corresponding organs of the latter. Intestinal caeca of former extend farther posteriorly than those of the latter. Ova of former much larger than those of latter.

Discussion.—In 1910 Linton described the genus *Genolopa* with *G. ampullacea* as the type and in 1911 Odhner described the genus *Proctotrema* with *P. bacilliova-*

Lasiotocus minutus (Manter, 1931) Thomas, 1959

Proctotrema minutum (Manter, 1931) Manter, 1942

Syn. Genolopa minuta Manter, 1931

Hosts: Menidia menidia, silversides
Fundulus majalis, minnow

at Beaufort, N.C.

Proctotrema (Manter, 1931) Manter, 1942

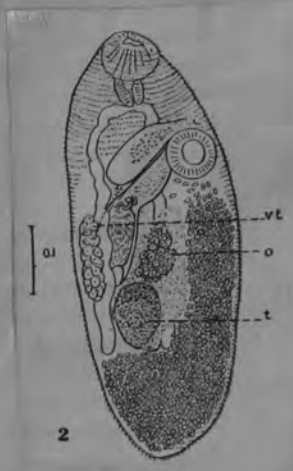
7. **Genolopa minuta** n. sp. (Fig. 2).

Synonym: *Monostomum* sp. Linton 1905, p. 356.
Hosts: *Menidia menidia*, silversides; *Fundulus majalis*, minnow.
Position: intestine. Frequency: common in silversides.

Body oval or slightly elongate, very small (0·35–0·63 mm. × 0·17–0·63 mm.) covered with spines. Oral sucker slightly larger than ventral sucker (*e.g.* 59 and 51μ; 56 and 48μ). Genital pore slightly to the left close in front of ventral sucker. Pre-pharynx lacking; pharynx almost spherical, oesophagus lacking or very short; caeca (weakly developed and usually covered by eggs) terminate a short but appreciable distance in front of the posterior end. Testis single, median, oval or elongate, slightly posterior to mid-body. Cirrus sac large, clavate, extending posterior to the ventral sucker. Cirrus armed with spines. Ovary oval, often inconspicuous, anterior to testis. Vitelline glands inconspicuous, forming two compact groups of cells, dorsal, just posterior to ventral sucker. Eggs oval (16–17 × 7–8μ) filling almost the entire body and covering nearly all the reproductive organs. Metraterm conspicuous, clavate, spined, considerably shorter than cirrus sac. Excretory system with short median stem.

One live specimen only 0·19 mm. in length was filled with eggs. No other internal organs could be made out.

This species differs from *Genolopa ampullacea*, to which it is most similar, in its more elongate body, relative sizes of the suckers, more posterior extent of the cirrus sac, and shorter caeca.



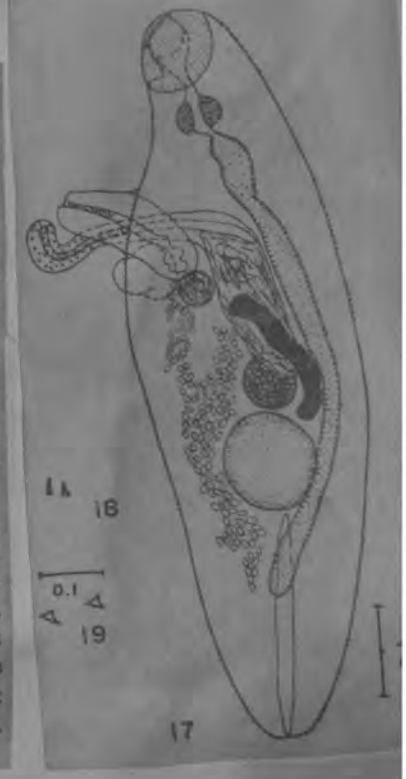
2

Lasiotocus minutum (Manter, 1931) n. comb.
(Figs. 17 to 19)

Host: *Fundulus similis* Baird & Girard; family Poeciliidae.
Incidence of infection: In 3 of 3 hosts.
Location: Anterior ⅓ intestine.
Locality: S. E. Beach Drive, St. Petersburg, Florida.

Specimens of a trematode which we believe to be *Proctotrema minuta* (Manter, 1931), Manter, 1942 were collected from *Fundulus similis* in St. Petersburg, Florida. Our specimens differed slightly from Manter's (1931) description of *P. minuta* from *Menidia menidia* and *Fundulus majalis*, in Beaufort, North Carolina. The egg size of our material is 16 to 20 microns long by 12 to 16 microns wide as compared with 16 to 17 microns long by 7 to 8 microns wide as given by Manter (1931). The specimen pictured in Figure 7 shows the eggs extending only a slight distance behind the testis. In other specimens in our collection, the eggs extend to the posterior end of the body. The genital atrium of most of our specimens is everted due to cirrus and metraterm protrusion. Careful examination reveals no spines to be present other than on the metraterm (Fig. 18), cirrus (Fig. 19), and cuticle.

According to Manter's (1942) interpretation, *Genolopa minuta* Manter, 1931 shares the unspined genital atrium in common with species of *Proctotrema* Odhner, 1911. Accordingly Manter (1942) transferred *G. minuta* to the genus *Proctotrema*. Yamaguti (1953) synonymized *Proctotrema* Odhner, 1911, with *Lasiotocus* Looss, 1907. We agree with this synonymy, but do not agree with Yamaguti (1953) in leaving *Proctotrema minuta* (Manter, 1931) Manter, 1942 in the genus *Genolopa* Linton, 1910. *Proctotrema minuta* (Manter, 1931) Manter, 1942 (Synonym: *Genolopa minuta* Manter, 1931) becomes *Lasiotocus minutum* (Manter, 1931) n. comb.



from Segundado-Bernal + Hutton, 1957

from:
Overstreet, 1969

Monorchiidae

Lasiotocus **mugilis** sp. n.
Figures 27, 28, and 29

Host: *Mugil cephalus* (1 of 3), type host.
Site: Intestine.
Holotype: U. S. N. M. Helm. Coll. No. 71311, paratype: No. 71372.

Description (based on 5 wholemounts): Body delicate, 0.8 to 1.3 long by 0.24 to 0.38 wide; forebody narrow; posterior end bluntly rounded. Cuticle spined. Eyespots lacking. Oral sucker weak, usually folded, 0.08 to 0.15 wide. Acetabulum weakly developed, 0.10 to 0.13 long by 0.09 to 0.12 wide. Sucker ratio 1:0.8 to 1.1. Forebody 29 to 34% of body length. Prepharynx shorter or longer than pharynx. Pharynx 0.05 to 0.06 long by 0.05 to 0.06 wide. Esophagus 0.07 to 0.10 long. Intestinal bifurcation usually nearer acetabulum than oral sucker. Caeca terminating near end of body.

Testis slightly irregular, submedian, 0.10 to 0.25 long by 0.08 to 0.12 wide. Posttesticular space 20 to 34% of body length. Cirrus sac large, arcuate, 0.22 to 0.30 long by 0.07 to 0.10 wide, extending near or into gonadal zone; containing ovoid seminal vesicle, well-developed prostatic cells, large saccate cells opening into pars prostatica, long cirrus with thorn-shaped spines 8 to 19 microns long. Genital atrium unspined. Genital pore median or submedian, anterior to acetabulum.

Ovary 0.10 to 0.20 long by 0.07 to 0.14 wide, lobed or unlobed; if lobed, with 3 or 4 lobes; slightly dextral to overlapping testis. Vitelline follicles in compact groups, at gonadal level, intercaecal or overlapping caeca. Terminal organ partially collapsed, not over ½ as long as cirrus sac; anterior portion with spines 16 to 21 microns long, posterior portion unspined. Uterus not extending past midposttesticular level, entering terminal organ near junction of spiny and unspined portions. Eggs 11 to 17 by 9 to 10 microns.

Excretory vesicle I-shaped, epithelial, extending near or into testicular level; pore terminal.

Discussion: Several species of *Lasiotocus* have caeca extending to near the end of the body and vitellaria at the gonadal level. This species can be differentiated from *L. latus* (Manter, 1942) by body shape and arrangement of gonads; from *L. beauforti* (Hopkins, 1941) by length of excretory vesicle, number of posttesticular uterine coils, and sucker ratio; from *L. longicaecum* Manter, 1940, by body shape and character of oral sucker; from *L. chaetodipteri* Thomas, 1959, by the body shape and amount of posttesticular space; from *L. longovatus* (Hopkins, 1941) and *L. pritchardae* Nahhas and Cable, 1964, by sucker ratio and size of eggs; from *L. malasi* (Nagaty, 1948) by the site of the vitellaria and length of esophagus and eggs; from *L. himezi* Yamaguti, 1951, *L. odhneri* (Srivastava, 1939), and *L. cacuminata* (Nicoll, 1915) by size of body and eggs and number of posttesticular uterine coils.

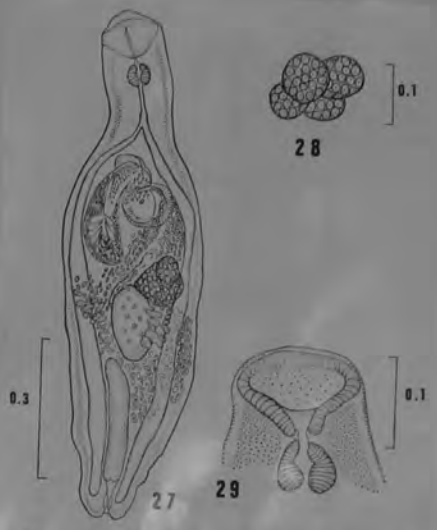


Figure 27. *Lasiotocus mugilis*, holotype, dorsal view. Figure 28. *Lasiotocus mugilis*, ovary from different specimen. Figure 29. *Lasiotocus mugilis*, anterior end.

31. *Lasiotocus oculatus* (Manter et Pritchard, 1961) n. comb.
(Fig. 30)

HABITAT: Intestine of *Albula vulpes* (local name "oio"); Hawaii.

Specimens deposited in U. S. Nat. Mus. Helm. Coll., No. 63558.

DESCRIPTION (based on 20 whole mounts): Body fusiform, spinose, oculate, with blunt extremities, 1.0-1.5 mm long, 0.22-0.4 mm wide in midregion. Oral sucker 70-120 × 80-140 μ; prepharynx distinct; pharynx barrel-shaped, 30-100 × 30-70 μ; esophagus 50-100 μ long; ceca terminating short of posterior extremity. Acetabulum 0.07-0.16 mm in diameter, in posterior part of anterior third of body.

Testis elliptical, 0.16-0.25 × 0.11-0.16 mm, immediately postequatorial. Cirrus pouch claviform, 0.25-0.43 × 0.06-0.12 mm, reaching to near ovary. Seminal vesicle 0.08-0.18 × 0.05-0.1 mm; prostate cells well developed, though the pars prostatica is not well differentiated; cirrus lined with conical pointed spines 10-30 μ long. Genital atrium largely smooth. Genital pore immediately pre-acetabular.

Ovary subglobular, 0.06-0.12 × 0.08-0.12 mm, anterodextral to testis. Uterus filling most of postacetabular space; metraterm opening into distal portion of terminal organ. Terminal organ 0.16-0.25 × 0.11-0.16 mm; basal vesicle large, oval, 0.13-0.15 × 0.07-0.1 mm; short cylindrical distal portion with thick wall of circular muscles, densely covered inside with acicular spines. Eggs 16-21 × 9-13 μ in life. Vitellaria consisting on each side, of 8-14 rounded follicles, extending from level of posterior end of acetabulum or immediately posterior to it to level of ovary. Excretory vesicle not traced.

DISCUSSION: In *Genolpa oculata* Manter et Pritchard, 1961, the cirrus is stated to be unspined, but in the authors' Figure 2 of the terminal genitalia, the cirrus protruding into the genital atrium clearly shows "large, plate-like rudiments of spines." It seems certain, however, that these structures are actually spines pressed against the surface of the cirrus. The "metraterm" of Manter and Pritchard, described as "a short, weakly muscular, ovoid or pyriform in shape and unspined," must be the distal portion of the terminal organ, into which the metraterm opens, but in our specimens this portion is densely armed with acicular spines as usual. In view of complete agreement in measurements except those of egg size, it seems very likely that our specimens belong to *Genolopa oculata* which is now tranferred to *Lasiotocus*.

Yam., 1970

Monorchidae

Lasiotocus odhneri (Srivastava, H.D., 1939) Yamaguti, 1954 book ?

Syn: ***Proctotrema Odhneri***, n. sp. Srivastava, H.D., 1939

Host.—*Equula daura* Cuv.

Habitat.—Intestine.

Locality.—Karachi, Arabian Sea.

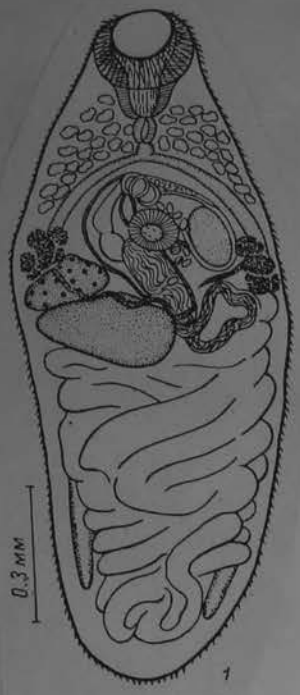
Only two mature specimens of this species were obtained from the intestine of a marine fish which was obtained from the Arabian Sea and examined at Karachi in June 1936. The parasite has a fusiform and spinose body. Cutaneous gland cells are well developed in the pre-acetabular part of the body. In permanent mounts the trematodes measure 2·0—2·4* in length and 0·58 in maximum breadth, which occurs across the level of the middle of vitellaria. The sub-terminal oral sucker of 0·12—0·16 in diameter is followed by a 0·04—0·09 long prepharynx a pharynx of 0·04—0·08 × 0·05—0·06 size and an oesophagus of 0·12—0·2 length. The oesophagus bifurcates into two narrow caeca which end blindly a little in front of the hinder end. The acetabulum measures 0·08—0·11 in diameter and is situated at the junction of the second and third fifths of the body length.

The single testis measures 0·22—0·24 in diameter and is situated mostly to the right of the median line, a little behind the middle of the body. The cirrus sac consists of a swollen part, containing an oval vesicula seminalis of 0·11—0·12 × 0·04—0·06 size, which opens through a narrow duct of 0·08 length into an oval pars prostatica, 0·05 × 0·03 in size, surrounded by prostate glands and a narrow neck containing a small ductus ejaculatorius and a fairly long cirrus, 0·15 × 0·04, with prominent recurved hooks of 0·02 × 0·008 size. The genital atrium lies to the right of the anterior margin of the acetabulum.

The ovary measures 0·14—0·16 × 0·12—0·14 in size and lies to the left of the median line obliquely in front of the testis and overlapping its anterior border. The vitellaria are composed of large, oval follicles arranged asymmetrically on the lateral sides between the levels of the acetabulum and middle of testis. Receptaculum seminis is absent. The shell gland complex lies between testis, ovary and the cirrus sac. Laurer's canal is present. The uterus contains a very large number of eggs of 0·02—0·023 × 0·015 size and occupies practically the whole of the post-acetabular space. Terminally the uterus continues into an inverted U-shaped metraterm of 0·14—0·18 diameter. The metraterm is surrounded by prominent gland cells. The excretory bladder is as in other species of the genus.

Odhner in 1911 created the genus *Proctotrema* for *P. bacilliovatum* which is parasitic in *Mullus barbatus*. Subsequently three more species—*P. lintoni* Manter [1931] *P. plectorhynchi* and *P. macrorchis* Yamaguti [1934]—have been added. *P. odhneri*, n. sp. differs from the type species in the shape and size of its suckers, unlobed character of ovary, shape and position of cirrus sac and metraterm and the shape of eggs. From *P. lintoni* it can be distinguished by the shape and size of suckers, position of genital pore, position of cirrus sac and metraterm and the absence of receptaculum seminis. From the last two Japanese species—*P. plectorhynchi* and *P. macrorchis*—it can be easily separated by the shape of the oral sucker, length of the intestinal caeca, character of ovary, shape of cirrus sac and metraterm and differences in the measurements of the various structures.

-OVER-



1

" Proctotrema odhneri
Srivastava, 1939 "

From ZHUKOV, 19??
INDIA
Liognathus daura (Cuv.)

see reprint

Lasiotocus

~~Proctotrema~~ plectorhynchi (Yamaguti, 1934) Yam., 1954

Body## elongated, 1.07 to 1.45 by 0.21 to 0.32 mm.
Oral sucker 0.1 to 0.15 mm. in diameter
Acetabulum 0.084 mm. in diameter
Testis oval, posterior to midbody. Cirrus sac (0.25 by 0.1 mm.) extending to dorsal side of ovary.
Ovary deeply trilobate, directly anterior to testis.
Vitellaria of 7 to 9 large compact follicles at ovariotesticular level on each side.
Eggs 26 to 29 by 15 to 18 μ
Host: Plectorhynchus pictus
Locality: Japan (Inland Sea)

Differs from P.bacilliovatum in characters of eggs and seminal vesicle. Differs from P.truncata in character of ovary and size of eggs; from P.Lintoni in size of eggs.

(syn.: *Proctotrema plectorhynchi*)

Хозяин, экстенсивность и интенсивность [illegible] *Plectorhynchus cinctus*, у 1 рыбы 9 экз. трематод; *Plectorhy[illegible]* рыб — 1 и 3 экз.

Локализация: кишечник.

FROM: Mamaev, 1970

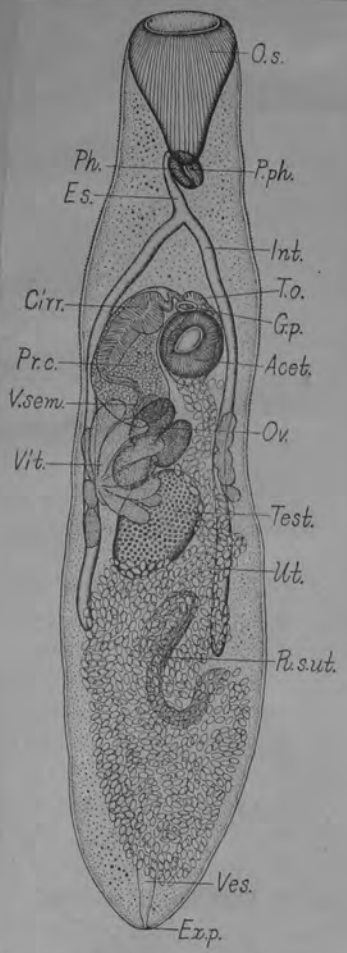


Fig. 69. *Proctotrema plectorhynchi*; ventral view, twisted. Type 1.45 × 0.315 mm.

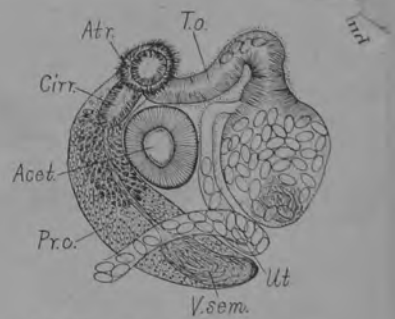


Fig. 70. Terminal genitalia of *Proctotrema plectorhynchi*.

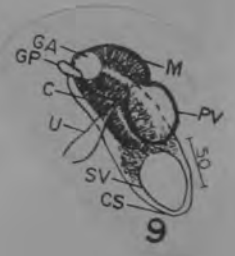
Lasiotocus sparisomae ~~sp. n.~~ (~~Figs. 8, 9~~) Fischthal + Nasir, 1974
Host: *Sparisoma viride* (Bonaterre) (Perciformes: Sparisomidae).
Site: Small intestine.
Locality: Los Testigos Islands.
Specimens deposited: No. 72876 (holotype); No. 72877 (paratype).

Description (based on two adult worms): Monorchiidae. Body elongate, with sides nearly parallel to being bottle shaped, 623–756 long by 185–237 wide at acetabular level, entirely spined. Forebody 248–367 long; hindbody 312–335 long; forebody–hindbody length ratio 1:0.9–1.3. Eye spot pigment absent. Oral sucker 157–160 by 148–200, ventroterminal, inverted bell shaped. Postoral circular muscle ring present. Acetabulum 54–63 by 70–75, very weakly muscular, entirely embedded in parenchyma. Sucker length ratio 1:0.34–0.39, width ratio 1:0.38–0.47. Prepharynx 28 long (holotype); pharynx 36–39 by 34–38; esophagus 41–68 long; cecal bifurcation 44–72 preacetabular; ceca narrow, terminating 173 from posterior extremity (in holotype), distance 52 per cent of hindbody length.

Testis single, smooth, median, round or nearly so, 97–114 by 97–125, lying 35–48 postacetabular and 160–182 from posterior extremity, latter distances 51–54 per cent of hindbody length. Cirrus sac elongate, oval to curved, longitudinal extent 110–175 by 40–67, commencing 65–67 postacetabular at testicular level, lying dextrally or sinistrally. Seminal vesicle saccular, 53 by 41 (in holotype). Pars prostatica short, surrounded by prostate cells. Cirrus long, entirely spined; spines long, slender, 10–15 by 2–3 at base. Genital atrium short, tubular, unspined. Genital pore median, just preacetabular. Ovary smooth, round or nearly so, 72–85 by 65–85, dextro- or sinistromedian, overlapping acetabulum to lying 12 postacetabular, overlapping testis ventrally. Vitellaria in two compact, lateral follicular masses at ovarian level, fields 69–73 by 50–53, nine follicles counted in one field; vitelline ducts dorsal to anterior part of testis. Uterus filling most of hindbody, entering medial side of terminal organ just anterior to posterior vesicle. Terminal organ bipartite, thick walled, muscular, longitudinal extent 72–120; anterior part (metraterm) 68 by 76 (in paratype), with long, slender spines similar to those of cirrus, 10–12 by 2–3 at base; posterior vesicle 60 by 65 (in paratype), unspined. Eggs numerous, operculate, 10 measuring 14–17 (15.5) by 9–12 (10.4).

Discussion

Our species differs from all others in the genus in having the acetabulum entirely embedded in the parenchyma. In having an inverted bell shaped oral sucker and a long prepharynx and esophagus our species appears closest to *L. beauforti* (Hopkins 1941) Thomas 1959 from perciform (Pomacentridae, Sparidae) fishes from North Carolina and the Gulf of Mexico, and *L. attenuatus* Fischthal & Kuntz 1969 from a perciform (Pomadasyidae) fish from Ghana. The latter species differs further in being twice as long, the ceca extending to the posterior extremity, and in having bilobed gonads and a very long, narrow posttesticular space. *L. beauforti* differs further in having the prepharynx longer than the esophagus, the cecal bifurcation at the anterior margin of the acetabulum, the ceca extending to the posterior extremity, the cirrus sac far anterior to the testis, and a cirrus with triangular spines.



Lasiotocus synapturae n. sp. (Figs. 10–11)

Fischthal & Thomas, 1969 norchiidae

Description (based on 1 worm from 1 host and 26 from another ; 12 measured) : Body 1,161-1,472 by 377—455 ; hindbody 755–1,020 long, sides nearly parallel, posterior extremity truncate, usually notched at excretory pore ; forebody 215–310 long, flat, tapering to rounded anterior extremity ; body at acetabular level and hindbody round and thick ; distinct shoulders sometimes present at acetabular level. Tegument spined laterally and dorsally to testicular level, ventrally to slightly posttesticular. Eyespots or their pigment granules absent. Oral sucker cupuliform, subterminal ventral, 123–150 by 133–157, round to slightly transversely elongate. Postoral circular muscle ring present. Acetabulum 123–142 by 114–160, round to transversely or longitudinally elongate, embedded in body fold, facing anteriorly or anteroventrally on anterior round, thick part of body, centre at level of anterior 23–30 per cent of body length. Sucker length ratio 1:0·94–1·03. Prepharynx very short, opening into pharynx anteroventrally ; pharynx 56–70 by 70–85, transversely elongate, overlapping oral sucker dorsally, surrounded by gland cells; oesophagus 37–61 long, thick walled, emerging from posterodorsal surface of pharynx ; caecal bifurcation 31–85 preacetabular ; caeca slender, cell lined, terminating 210–350 from posterior extremity, usually slightly anterior to midlength of posttesticular space.

Testis single, smooth to slightly lobed, dextromedian, intercaecal, may overlap right caecum ventrally, usually longitudinally elongate, 153–201 by 109–176, contiguous with ovary or not ; posttesticular space 395–650 long. Two vasa efferentia emerging from testis, uniting to form very short vas deferens before entering cirrus sac. Cirrus sac elongate, usually arcuate but may be straight, 131–290 by 84–104, walls very thick (4–20) and muscular, with outer longitudinal and inner thicker circular muscle layers, commencing 140–231 postacetabular between ovary and left caecum, may overlap both structures dorsally, may extend ventral to left caecum into extracaecal space, curving anterodextrally, terminating dorsal to acetabulum. Seminal vesicle oval, 83–119 by 48–61. Pars prostatica tubular, surrounded by prostate cells as are adjacent parts of seminal vesicle and cirrus. Cirrus eversible, with prominent rings of circular muscles, 108–198 by 21–50, with cone shaped tuft of slender spines up to 15 long at junction with pars prostatica ; at proximal end in one with partly everted cirrus, very small, mound-like spines present for short distance anterior to tuft. Genital atrium tubular, thick walled, muscular, longitudinally elongate, unspined. Genital pore median, just preacetabular, on flat forebody.

Ovary 85–123 by 68–119, usually longitudinally elongate, with indications of 2, 3, or 4 smooth lobes, one lobe always dorsal and cone shaped with oviduct emerging from it, dextral, intercaecal but may overlap right caecum ventrally or dorsally, may slightly overlap testis ventrally, lying 58–135 postacetabular. Seminal receptacle not observed ; sperm in proximal part of uterus. Laurer's canal present. Ootype complex posteromedial to ovary, anterior to testis.

Vitellaria in 2 lateral masses of large, round to elongate follicles, extending from slightly anterior to ovary to testicular level, lying 54–133 postacetabular. Vitelline ducts uniting dorsal to contiguity of gonads ; reservoir small. Uterus extending to posterior extremity, descending and ascending sinistral to testis, overlapping latter, intercaecal but may slightly overlap caeca, coils extending somewhat more laterally postcaecally, ventral to cirrus sac, terminating postacetabularly as a short, thick walled, muscular, winding structure opening into medial side of terminal organ just anterior to posterior vesicle. Terminal organ 167–227 by 77–100, bipartite, thick-walled, muscular, intercaecal, sinistral to cirrus sac, proximal part may overlap left caecum ventrally and cirrus sac ventrally or dorsally, extending 72–130 postacetabular, terminating dorsal to acetabulum ; posterior vesicle 80–133 long, unspined ; anterior part (metraterm) entirely lined with slender spines, opening into genital atrium through muscular bulb like sphincter, surrounded by gland cells. Eggs numerous, brown, operculate, 24 measuring 20–26 by 14–16.

Discussion : This new species differs from all other species in the genus in having the forebody flat, while the remainder is round and thick, with the acetabulum embedded in a body fold at its anterior part ; this characteristic is opistholebetid-like. The thick-walled, muscular cirrus sac resembles that of *Lasiotocus cynoglossi* Thomas, 1959.

Excretory bladder tubular to slightly saccular, very thick walled, short, extending anteriorly up to or just overlapping uterine coils, 97–124 long, primary ducts joining anterior part of bladder subterminally and laterally ; narrow duct connecting bladder to just subterminal dorsal pore.

Host : *Synaptura lusitanica* Capello, sole (Soleidae).

Location : Small intestine.

Locality : Tema, Ghana.

Date : 29 March 1965.

Specimens : USNM Helm. Coll. No. 63377 (holotype) ; No. 63378 (paratypes).

Lasiotocus trachinoti sp. n.
Overstreet & Brown, 1970
(Figs. 1–3)

Description (based on 18 adult specimens): Body elongate, tapered posteriorly more than anteriorly, 346 to 654 long by 152 to 226 wide at or posterior to acetabular level. Tegument entirely spined. Forebody 122 to 226 long, 33 to 41% of body length; hindbody 163 to 370 long, 47 to 57% of body length. Eyespots anterior to, posterior to, or at pharyngeal level; usually asymmetrical. Oral sucker subterminal, 53 to 59 long by 50 to 70 wide. Acetabulum 49 to 61 long by 45 to 61 wide. Sucker width ratio 1:0.80 to 1.01. Prepharynx about ½ length of pharynx. Pharynx 26 to 35 long by 26 to 30 wide, elongate or spherical. Esophagus 17 to 58 long. Cecal bifurcation usually closer to pharyngeal than acetabular level; ceca usually extending well into testicular level.

Genital pore median or slightly submedian, immediately preacetabular, followed by unspined genital atrium. Testis smooth, elongate, 79 to 201 long by 47 to 88 wide, approximately medial; posttesticular space 28 to 70 long, 7 to 14% of body length. Cirrus sac 88 to 159 long by 15 to 65 wide, curving from genital atrium dorsal to or around right side of acetabulum with base posterior to sucker; containing internal seminal vesicle, prostatic cells, pars prostatica, cirrus; cirrus approximately ⅓ length of sac with spines up to 5 long; spines evenly distributed except for few usually inconspicuous or absent basal spines.

Ovary entire or irregularly lobed, usually elongate, dextral or median, pretesticular or overlapping testis, 47 to 109 long by 28 to 79 wide. Terminal organ well developed, 73 to 112 long by 26 to 52 wide; posterior portion vesicular, unspined; anterior portion about ½ length of organ, unspined region between proximal and distal spines. Vitelline follicles in lateral fields, extending from or below level of posterior border of acetabulum to or ahead of anterior border of testis. Laurer's canal present. Uterus extending to near or slightly beyond posterior border of testis, sperm in proximal loops, entering terminal organ near junction of anterior and posterior portions. Eggs operculate, minute projection on anopercular end, 19 to 26 long by 12 to 17 wide, typically 22 to 23 by 14.

Excretory vesicle extending to posterior portion of testis; pore terminal.

Host: Trachinotus carolinus, pompano (Carangidae), type host.

Sites: Intestine and pyloric ceca.

Localities: Fort Matanzas Beach, Butler Beach, and Crescent Beach, Florida.

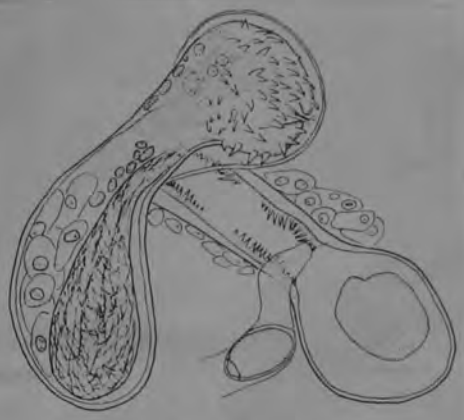
Holotype: USNM Helm. Coll. No. 70815, paratype: No. 70816.

Remarks

The name "*trachinoti*" refers to the type host.

Lasiotocus trachinoti is similar to *L. mulli* (Stossich, 1883), the type species, in shape of body; general shape and position of the ovary, testis, and vitellaria; ratio of the esophageal to pharyngeal length; and sucker ratio. There are, however, some important discrepancies between the only good descriptions of *L. mulli*: Dollfus (1948) and Bartoli and Prévot (1966). *Lasiotocus trachinoti* is more like those specimens described by the latter in possessing sperm in the uterus rather than a true seminal receptacle and eyespots and the uterus entering the middle of the terminal organ. The eggs in our specimens are nearer the size illustrated by Bartoli and Prévot, who did not state sizes nor dispute the large sizes reported by Dollfus. Works by the above authors on *L. mulli* deal with specimens from *Mullus barbatus*, the type host, in the Mediterranean region. *Lasiotocus trachinoti* differs from *L. mulli* by being smaller and having distal cirrus spines evenly dispersed rather than clustered.

1



2

3

Lasiotocus Thomas, 1959

Proctotrema truncatum (Linton, 1910) Manter, 1940

(Figs. 7–8)

Hosts: Haemulon album Cuv. & Val.,* in one of two; *H. flavolineatum* (Desmarest),* in five of nine; *H. plumieri* (Lacépède), type host, in eight of 34; *H. sciurus* (Shaw), in four of 24. These records of incidence should be considered as minima. The parasite is so small as to be easily over-looked.

Location: Ceca and intestine.

Diagnosis: Body spined, 0.747 to 0.994 mm. by 0.297 to 0.340 mm.; only slightly tapering anteriorly, with truncated anterior end, somewhat more pointed posteriorly. Oral sucker terminal, 0.180 to 0.229 mm. in transverse diameter, funnel-shaped. Acetabulum about one-third from anterior end, 0.062 to 0.070 mm. in diameter or about one-third diameter of oral sucker. Prepharynx short; pharynx 0.042 to 0.060 mm. long by 0.033 to 0.500 mm. wide; esophagus approximately length of prepharynx; narrow ceca extending near sides of body to slightly beyond midbody or about to level of testis. Genital pore median or submedian, slightly anterior to acetabulum, about midway between acetabulum and bifurcation of intestine. Testis immediately posterior to midbody, somewhat variable and irregular in shape. Cirrus sac 0.187 to 0.256 mm. long by 0.075 to 0.076 mm. wide (Fig. 8). Ovary well to right, about at midbody level, between acetabulum and testis, indistinctly trilobate. Vitellaria of eight or nine follicles on each side at ovarian level. Uterus filling body posterior to testis. Post-testicular space approximately one-third body length. Metraterm sac 0.136 to 0.144 mm. long by 0.075 mm. wide (Fig. 8). The spines in the metraterm do not seem to be uniformly arranged. One group of these spines may be associated with the atrium but this is not clearly evident in toto-mounts. The apparently spiny condition of the atrium shown in Fig. 8 is thought to be due to a partially protruded cirrus.

a muscular metraterm at end of uterus present; ovary irregularly shaped. atrium unspined

Lasiotocus truncatus (Linton, 1910) Thomas, 1959

Synonyms: Genolopa truncatum Linton, 1910; *Proctotrema truncatum* (Linton) Manter, 1940.

Hosts: **Bathystoma aurolineatum* (J); **Brachygenys chrysargyreus* (C); **Calamus calamus* (J); *Haemulon album* (C); **H. bonariense* (J); *H. flavolineatum* (C, J); *H. sciurus* (J); **Lutianus mahogoni* (C). Site: ceca and intestine. JAMAICA, CURAÇAO

FROM NAHHAS AND CABLE (1964)

Proctotrema truncatum (Linton, 1910) Manter, 1940

Hosts.—*Caranx ruber* (Bloch), skip-jack [new host record]; *Haemulon parra* (Desmarest), sailor's choice; *Haemulon plumieri* (Lacépède), white grunt; *Haemulon sciurus* (Shaw), blue-striped grunt.

Location.—Pyloric ceca.

Locality.—*C. ruber* from W. shore of N. Bimini; *H. parra* and *H. plumieri* from 1/2 mi. S. of S. Bimini; and *H. sciurus* from Lerner fish pens and N. shore, N. Bimini, B.W.I. [new locality records].

Sogandares, 1959

Lasiotocus truncatus (Linton, 1910) Thomas, 1959

Genolopa truncatum Linton, 1910.
Proctotrema truncatum (Linton, 1910) Manter, 1940.

Hosts: Haemulon flavolineatum (2 of 2); *Haemulon plumieri* (4 of 5); *Haemulon sciurus* (5 of 6).
Site: Pyloric caeca.

From: Overstreet, 1969.

32. *Lasiotocus ulua* ~~n. sp.~~ Yam., 1970
(Fig. 32)

HABITAT: Intestine of *Carangoides ferdau* (local name "ulua"); Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63559.

DESCRIPTION (based on 26 whole mounts): Body fusiform, more pointed behind than in front, 1.2-2.35 mm long, 0.3-0.5 mm wide in midregion. Cuticle spinose for greater anterior part of body, heavily pigmented in pharyngo-esophageal region. Oral sucker ventroterminal, rounded or funnel-shaped, comparatively thin-walled, 46-84 × 77-112 μ; prepharynx very short; pharynx globular, 30-50 × 37-65 μ; esophagus very narrow, 0.18-0.41 mm long, bifurcating about middle of anterior third of body. Ceca terminating at posterior extremity. Acetabulum weakly muscular, 70-116 μ in transverse diameter, at or near posterior end of anterior third of body.

Testes elongate, approximately sausage-shaped, 0.3-0.65 × 0.1-0.13 mm, intercecal, near posterior extremity. Cirrus pouch elongated claviform, thick-walled, usually sigmoid anteriorly, 0.23-0.67 mm long, 54-80 μ wide at posterior swelling, extending from immediately in front of acetabulum to near ovarian level; seminal vesicle elliptical, 115-260 × 35-65 μ; pars prostatica long, narrow, well provided with prostate cells. Cirrus usually protruded, 90-240 × 20-35 μ, appearing spinose inside, probably because of corrugation of its cuticular lining, but smooth outside when evaginated, opening into genital atrium opposite opening of terminal organ, just in front of acetabulum.

Ovary trilobate, usually elongated longitudinally, obscured by overlapping uterus, 0.2-0.35 mm long, situated between acetabulum and testis; shell gland complex compact, but moderately large, between ovary and testis. Uterus forming longitudinal loops on each ventrolateral side of testis, but largely transverse loops between acetabulum and testis, occupying most of hindbody; metraterm opening into distal end of terminal organ. Terminal organ consisting of basal vesicle 80-190 μ long by 95 μ wide and a subcylindrical armed distal portion; the spines lining this latter portion are very minute, rosethorn-shaped, not acicular, and rather sparse, absent at extreme anterior end of portion opening into genital atrium. Eggs oval, 23-28 × 10-16 μ in life as well as in balsam mounts. Vitellaria consisting, on each side, of several (7?) tubular lobes, extending largely at testicular level. Excretory vesicle tubular, giving off at its anterior end a pair of winding lateral collecting vessels reaching to oral sucker.

DISCUSSION: This species is characterized by the heavy pigmentation of the forebody, by the long ceca, the long testis, and the tubular vitellaria. It differs from the most closely related *Lasiotocus fusiformis* Yamaguti, 1934 from *Plectorhynchus pictus* of Japan in the ceca and testis being much longer, in the different structure of the terminal organ, in its lack of a muscular bulb at the distal end of the metraterm, and in the shape and extent of the vitellaria. The specific name refers to the local name of the host. Yam., 1970

33. *Lasiotocus weke* ~~n. sp.~~ Yam., 1970

(Fig. 33)

HABITAT: Pyloric ceca and intestine of *Mulloidichthys samoensis* (type host, local name "weke"), *M. pfluegeri*, and *Parupeneus pleurostigma*; Hawaii.

HOLOTYPE: U. S. Nat. Mus. Helm. Coll., 63560.

DESCRIPTION (based on 13 whole mounts from type host and two from other hosts): Body small, delicate, elongate, with attenuated forebody and blunt-pointed posterior extremity, 1-2 mm long, 0.25-0.42 mm wide in midregion. Cuticle finely spinose for greater anterior part. No eyespots. Oral sucker subterminal, with ventral aperture, 46-93 X 65-100 μ; prepharynx may be 20-40 μ long when extended; pharynx barrel-shaped, 42-70X 44-68 μ; esophagus 0.2-0.55 mm long, may be up to 0.6 mm or longer when fully extended, bifurcating at about junction of anterior with middle third of body; ceca terminating short of posterior extremity. Acetabulum weakly muscular, 0.09-0.14 mm in diameter, pre-equatorial or equatorial.

Testes single, elongate, 0.2-0.3 X 0.05-0.1 mm, confined to posterior intercecal field, with its anterior end usually overlapping ovary. Cirrus pouch claviform, more or less curved, 0.2-0.4 X 0.06-0.12 mm, hardly reaching to ovary; seminal vesicle oval, 0.06-0.12 X 0.05-0.1 mm; pars prostatica not distinctly differentiated, although prostatic cells are strongly developed; cirrus claviform, 120-140 X 80-90 μ when everted, densely armed with pointed, curved spines 11-25 μ long by 2-9 μ wide at base. Genital atrium unspined, opening immediately in front of acetabulum.

Ovary subglobular to oval, 0.1-0.2 X 0.06-0.1 mm, situated a little to right (or left) of median line immediately in front of testis, or level with it; in the type it lies at the posterior end of the middle third of body; in one young adult, however, it lies more posteriorly. Laurer's canal opening posterolaterally at level of posterior end of ovary. Uterus forming several longitudinal loops and occupying greater ventral part of hindbody; metraterm opening into distal portion of terminal organ. Terminal organ 0.16-0.28 X 0.05-0.12 mm; its basal vesicle up to 120 μ by 90-110 μ; distal portion densely covered inside with acicular spines 13-26 μ long. Eggs oval, 13-16 X 9-12 μ. Vitellaria consisting, on each side, of long slender tubules extending along ceca from behind acetabular level to testicular level; transverse vitelline ducts joining together dorsal to ovary. Excretory vesicle saccular, small; pore terminal.

DISCUSSION: This species differs from the most closely related *Lasiotocus delicatus* Manter et Pritchard, 1961 in the ceca reaching well back of the testis to near the posterior extremity, and occasionally back of the uterus; in the latter species the ceca usually terminate at the level of the testis and do not reach beyond the uterus.

Yam., 1970

LOOSE LEAF
ORGANIZER

SCHEDULE

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

NAME _____

ADDRESS _____

SCHOOL _____ TELEPHONE _____

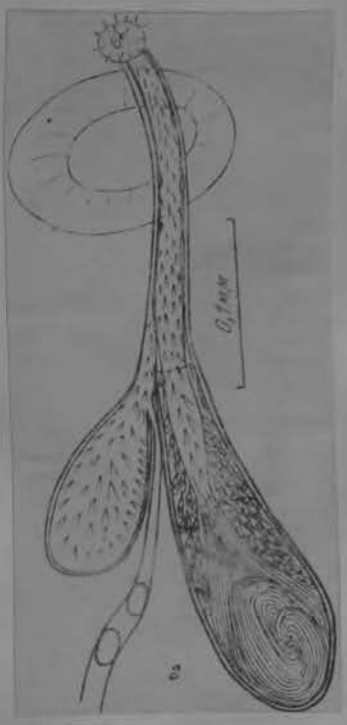
LASIOTOCUS

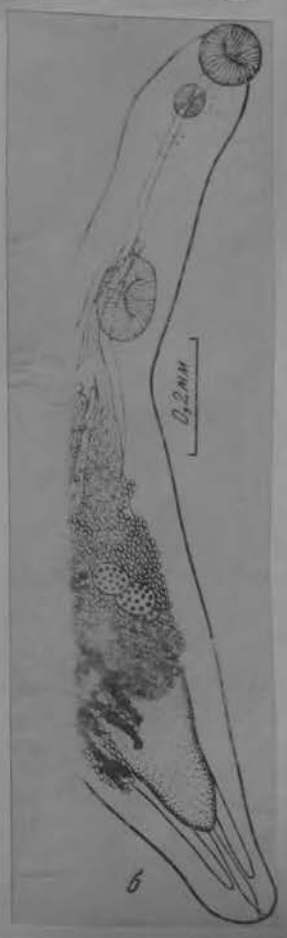
Monorchiidae

Диагноз рода *Leiomonorchis* ~~gen. nov.~~ *Monorchidae, Monorchinae.* Удлиненные трематоды, кишечник которых почти достигает заднего конца тела. Ротовая присоска круглая, терминальная; брюшная несколько больше ротовой, расположена в передней трети тела. Имеются префаринкс и пищевод. Семенник один, в заднем конце тела. Половая бурса содержит овальный семенной пузырек, простатическую часть и вооруженный шипами цирруc. Орган Лооса простой, мешковидный, снабжен тонкими шипами. Имеется длинный половой атриум, покрытый шипиками. Яичник четырехлопастный, лежит впереди семенника. Желточники в виде двух ветвящихся образований в задней трети тела между бурсой цирруса и семенником, назад за семенник не заходят. Матка занимает заднюю половину тела, назад за семенник не заходит. Экскреторный пузырь трубчатый, длинный, доходит до уровня бифуркации кишечника.

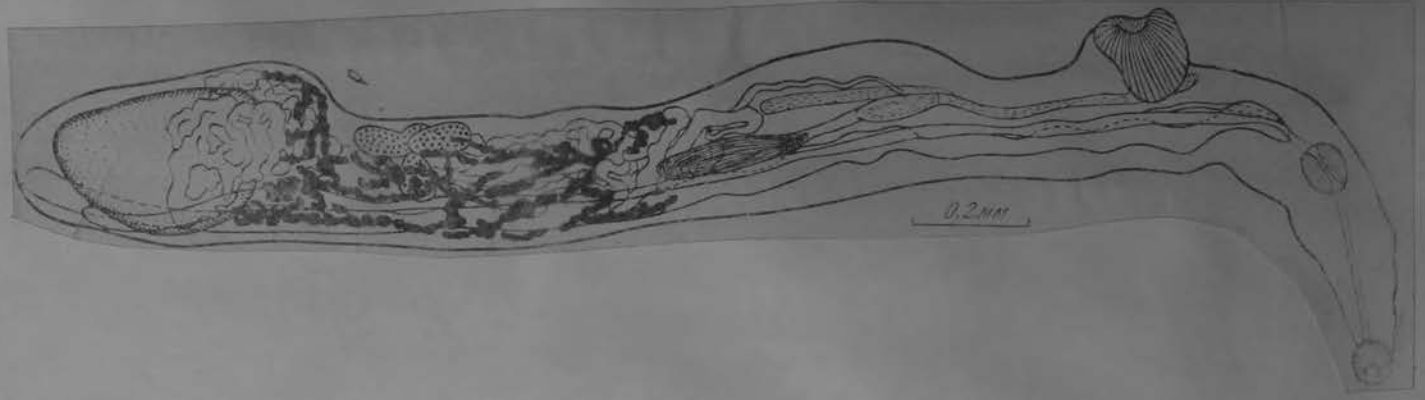
Типичный вид: *Leiomonorchis jeniathi* ~~sp. nov.~~

Mamaev, 1970





—over—


0.2mm

LEIOMONORCHIS

Mamaev, 1970

Longimonorchus ovocutus ~~gen. et sp. nov.~~

[illegible]

...тивация кишечника.

...сто и время обнаружения [illegible]

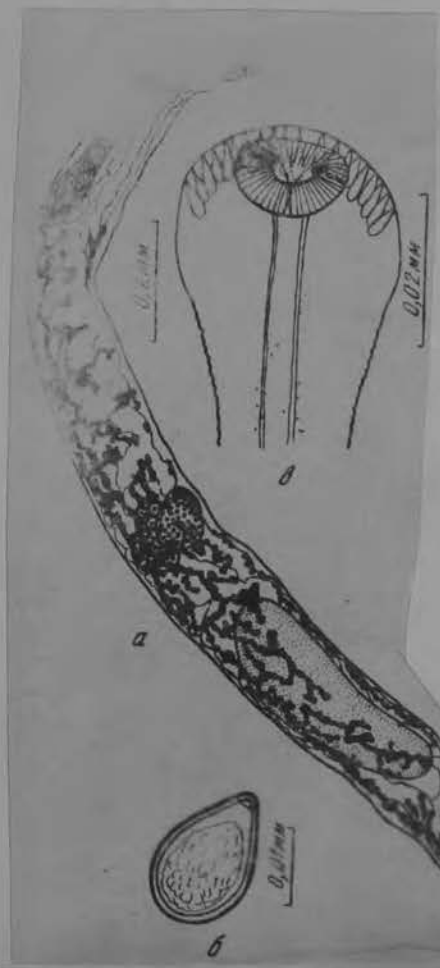
... — май, август-сентябрь 1960 г. и май-июнь 1961 г.

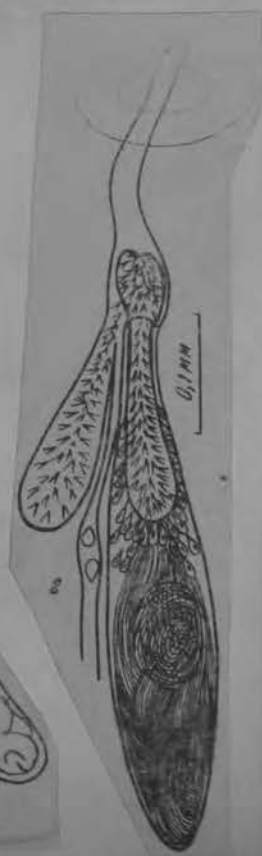
Частота встречаемости: у 25 экз. рыб из 65 исследованных (38,5%), при интенсивности от единичных экземпляров до 50.

Строение. Тонкая нежная трематода длиной 2,77 *мм*, максимальной шириной во второй половине тела 0,17 *мм*. Задняя половина тела более или менее равномерной ширины, задний конец тупо закруглен, к переднему концу тело постепенно сужается, так что наиболее узкое место находится позади ротовой присоски. Передний конец около ротовой присоски, наоборот, несколько расширен и тупо закруглен. Маленькая круглая ротовая присоска со слабо развитой мускулатурой, 0,05 *мм* в диаметре, расположена вентро-апикально. За ней следует очень длинный префаринкс — 0,43 *мм*, вокруг которого в толще тела рассеяны мелкие зерна пигмента. Фаринкс крупный, овальный, 0,08×0,05 *мм*. Пищевод длиной 0,25 *мм*, перед брюшной присоской разделяется на две ветви кишечника, которые не доходят до заднего конца тела, а кончаются где-то на уровне семенника. Брюшная присоска больше ротовой, 0,10 *мм* в диаметре, находится на расстоянии 0,80 *мм* от ротовой, промер между центрами присосок.

Крупный удлиненный семенник, размером 0,46×0,13 *мм*, расположен в задней четверти тела, несколько впереди него четырехлопастный янч-

~over~





ник, его размеры, приблизительно, 0,15×0,10 *мм*. Впереди яичника находится крупное тельце Мелиса и семеприемник. Половое отверстие непосредственно позади развилки кишечника перед брюшной присоской, [illegible] шипами половой [illegible] присоски впадают [illegible] бурса цирруса, [illegible] половой орган Лоосса по размерам, вдвое меньше бурсы. Последняя содержит крупный овальный семенной пузырек, простатическую часть и циррус, вооруженный острыми, но короткими и широкими шипами. Орган Лоосса простой, т. е. не разделенный на две части, весь покрыт внутри шипами такой же формы, как и шипы цирруса. Матка впадает в самую переднюю часть органа Лоосса. Желточники очень сильно развиты, они представляют собой сложную древовидно ветвящуюся сеть мелких фолликулов, простирающуюся, главным образом, по дорзальной и латеральным сторонам, от заднего конца бурсы цирруса почти до самого заднего конца тела. Петли матки заполняют все свободные промежутки в задней половине тела, в том числе позади семенника. Яйца мелкие, 0,020—0,021×0,012—0,013 *мм*, с широким задним и острым передним концами. Оболочка яиц довольно толстая, темно-желтого цвета. Экскреторный пузырь короткий, точно его форму определить не удалось, так как виден лишь его конечный отдел, все остальное скрыто петлями матки.

Изменчивость признаков. В качестве типового был взят экземпляр средних размеров. Длина тела других экземпляров была 4,0—5,1 *мм*, максимальная ширина 0,15—0,50 *мм*. Диаметр ротовой присоски 0,05—0,06 *мм*, брюшной присоски 0,09—0,14 *мм*. Размеры фаринкса 0,07—0,11×0,03—0,06 *мм*. У наиболее молодых экземпляров трематод хорошо выражена «шейка» позади ротовой присоски, а на переднем крае головного конца заметны мелкие грушевидные железы. У всех экземпляров префаринкс всегда значительно длиннее пищевода, а фаринкс крупнее ротовой присоски. Желточники, как правило, выходят за задний край семенника, реже кончаются на уровне [illegible] края семенника или до-

[illegible] от каждого [illegible]
[illegible]ом, что описанный вид [illegible]
[illegible]которому даем следующий диагноз:

[illegible] рода *Longimonorchis* gen. nov.

[illegible]idae, Monorchinae. Трематоды с длинным и тонким телом. [illegible] присоска маленькая, со слабо развитой мускулатурой, по размерам [illegible] меньше фаринкса. Префаринкс очень длинный, пищевод короткий. Брюшная присоска крупнее ротовой. Кишечные ветви не [illegible] до заднего конца тела, кончаются на уровне семенника. Крупный семенник расположен в задней четверти тела на некотором [illegible] расстоянии от заднего конца тела. Крупная бурса цирруса содержит [illegible] овальный семенной пузырек, простатическую часть и циррус, вооруженный [illegible] короткими шипами. Половой атриум довольно длинный, без шипов. [illegible] Орган Лоосса простой, мешковидный, внутри весь покрыт шипами [illegible] такие же формы как и шипы цирруса. Матка впадает в переднюю часть [illegible] Лоосса. Яичник четырехлопастной, находится впереди семенника, [illegible] за ним семеприемник. Желточники очень сильно развиты, простираются [illegible] от заднего конца бурсы почти до заднего конца тела. Матка заполняет [illegible] всю заднюю половину тела, в том числе позади семенника. Яйца [illegible], с широким задним и острым передним концами. Экскреторный [illegible] пузырь короткий.

Типичный вид *Longimonorchis ovacutus* sp. nov.

LONGIMONORCHIS

Monorcheides Odhner, 1905

Generic diagnosis. — Monorchiidae, Monorchiinae: Body elongate oval, spinulate. Oral sucker, pharynx and intestine as in *Monorchis*. Acetabulum small, in anterior half of body. Testes double, symmetrical, one on each side in hindbody. Cirrus pouch small, not extending further backward than acetabulum. Genital pore median, just postbifurcal. Ovary deeply lobed, submedian, pretesticular. Vitellaria forming paired groups of follicles, one on each side of acetabulum. Uterus winding from side to side in hindbody, opening into terminal organ at its base. Excretory vesicle Y-shaped. Parasites of marine fishes.

Genotype: ***M. diplorchis*** Odhner, 1905 (Pl. 5, Fig. 57), in ***Lumpenus medius;*** Spitzbergen.

Other species:

M. cumingiae, Martin, 1939

Sporocyst, cercaria and metacercaria in marine bivalve, ***Cumingia tellinoides*** (Conrad), experimental adult in anterior

part of the intestine of eels and flounders; cercaria with eye spots, flame cell formula: $2[(2+2)+(2+2)]=16$, tail with lateral lappets.

M. popovici Szidat, 1950, in *Eleginops maclovinus;* Tierra del Fuego.

M. soldatovi Issaitschkow, 1928, in *Aspidophoroides orliki;* Arctic.

Monorcheides (?) *petrowi* Layman, 1930, should not be referred to the present genus.

Monorchidae
Monorchinae

MONORCHEIDES Odhner, 1905

Monorchinae. Excretory vesicle with lonh stem. Two testes. Vitellaria on each side of ventral sucker. Vagina entirely spined, with terminal opening of uterus ? In intestine of marine fish.
Type species: Monorcheides diplorchis Odhner, 1905

Monorcheides diplorchis Odhner
M. soldatovi Issaitschikow, 1928
(M. (?) petrovi Layman, 1930)
M. popovicii Szidat, 1950
M. cumingiae Martin, 1940

Monorchiidae

Monorcheides diplorchis Odhner, 1905

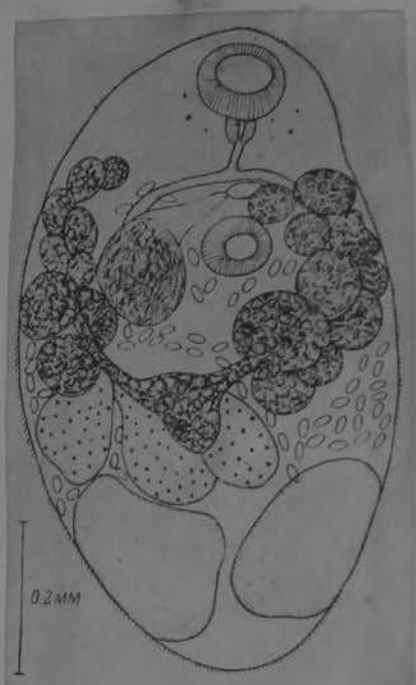


Рис. 2. *Monorcheides diplorchis* Odhner, 1905 из *Platessa quadrituberculata* (Pall.).

FROM ZHUKOV, 1963

24. *Monorcheides alexanderi* n. sp. Arai, 1962

Hospedador: *Paralabrax clathratus* (Girard), Hospedador típico.
Localización: ciegos pilóricos.
Distribución geográfica: Isla Guadalupe, México. (Localidad típica).
Holotipo: En la Colección Helmintológica del Museo Nacional de Estados Unidos.
Paratipos: Colección Helmintológica, Museo Nacional, Estados Unidos y Colección Helmintológica del Departamento de Zoología, de la Universidad de California en Los Angeles, Calif., EE. UU.

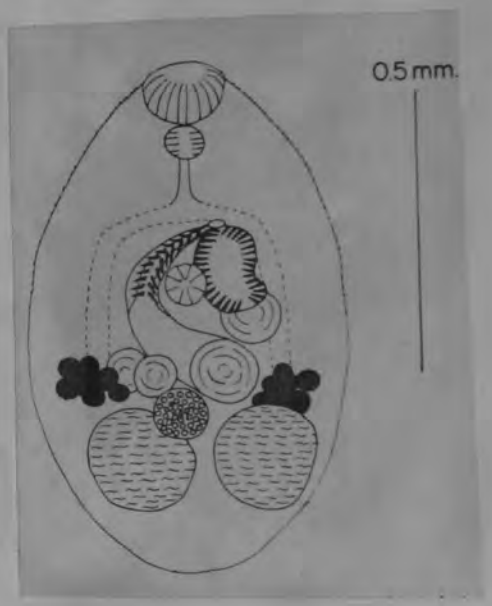
Descripción basada en veintiún ejemplares. Cuerpo elipsoide, con espinas, de 0.752-0.940 (0.878) de largo, por 0.400-0.611 (0.503) de ancho. Ventosa oral terminal, casi esférica, debilmente musculosa, de 0.094-0.116 (0.105) de diámetro transversal. Prefaringe corta. Faringe esférica, 0.055-0.075 (0.062) de diámetro. Esófago y ciegos intestinales no perceptibles.

Ventosa ventral ecuatorial, redondeada en sección óptica, de 0.061-0.094 (0.073) de diámetro, débilmente musculosa; relación del tamaño de la ventosa oral a la ventosa ventral, 1.4:1.

tuado entre el testículo y la faringe; huevos de 0.024-0.029 (0.027) de largo por 0.015-0.019 (0.017) de ancho. Vitelógenas en dos grupos laterales con cinco o seis folículos largos, situados cerca de la superficie dorsal, en posición pretesticular o sobrepuestos en la parte anterior de los testículos. La vesícula excretora muy indistinta pero aparentemente tubular.

Discusión. La posición posterior de los testículos ovoides y la distribución pretesticular de las asas uterinas y los folículos vitelógenos, asignan a esta especie al género *Monorcheides* Odhner, 1903. La distribución de los folículos, en posición preacetabular y acetabular en *M. diplorchis* y en posición intertesticular en *M. cummingiae* distinguen los de la especie nuestra en que presenta las vitelógenas en posición anterior a los testículos. El tamaño más grande del ovario y las vitelógenas con folículos vitelógenos numerosos y extensivos diferencian a *M. soldatovi* de *M. alexanderi*. Las ventosas grandes, la disparidad de las proporciones entre las ventosas, el cuerpo más pequeño y la diferencia de la apariencia del ovario distinguen a *M. popovicii* de la especie nuestra.

Se nombró esta especie en honor al Dr. Claude G. Alexander su primer colector.



Poro genital en posición media entre la faringe y el acetábulo. Testículos uno al lado del otro, casi siempre cerca del extremo posterior del cuerpo, ovoides con diámetro longitudinal paralelo a los lados del cuerpo, generalmente de igual tamaño en cada ejemplar, de 0.160-0.275 (0.230) de largo en su eje mayor. Bolsa del cirro grande, se extiende lateral y dorsalmente, posterior a la ventosa ventral, de 0.088-0.118 (0.102) de diámetro transversal, incluyendo a la vesícula seminal y al cirro, que presenta espinas prominentes. Ovario con tres lobulaciones marcadas, en posición pretesticular, desplazado hacia la derecha de la línea media; lobación más grande, 0.088-0.118 (0.103). El metratermo está compuesto de una parte musculosa proximal y otra parte espinosa terminal, con espinas comparables en tamaño y apariencia a las del cirro, la unión del útero con el metratermo, no es conspicua. Utero generalmente si-

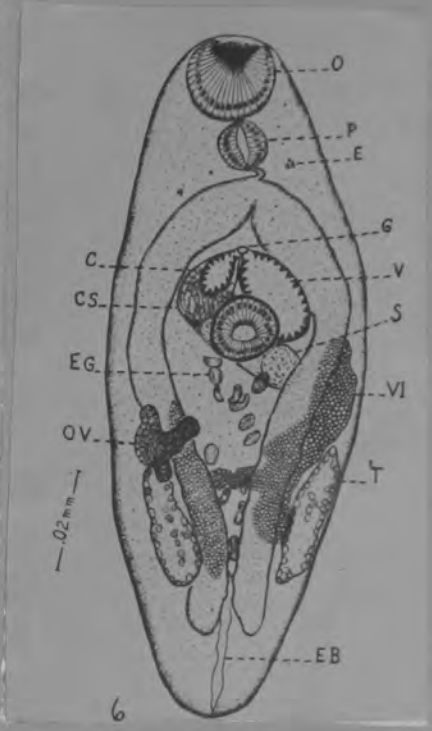
Paramonorcheides cumingiae (Martin, 1938) Szidat, 1949

Syn. Monorcheides cumingiae (Martin, 1938)
from Martin, 1940

Moved to Paramonorcheides by Szidat - 1949

Hosts: eels & flounders (exp.) at Woods Hole

The adults are extremely small trematodes as shown by the following measurements based on five specimens, all of which contained eggs. The body length is 0.255–0.318, with an average of 0.30 mm.; the body width is 0.1–0.164, with an average of 0.142 mm. The cuticula is spined with the spines being somewhat more conspicuous on the anterior half of the body. The oral sucker is terminal or subterminal and measures from 0.0315–0.0415, with an average of 0.0367 mm. in length by 0.0348–0.0498, with an average of 0.0408 mm. in width. The ventral sucker measures from 0.0232–0.0332, with an average of 0.026 mm. in length by from 0.0291–0.0332, with an average of 0.032 mm. in width. The very short prepharynx (about 0.003–0.004 mm. in length) is followed by a pharynx that is on the average 0.0185 mm. in length by 0.022 mm. in width. The esophagus is approximately 0.0124 mm. long and it leads to the forking of the intestine which occurs about midway between the two suckers. The intestinal rami approach, but do not extend to, the posterior end of the body. The reproductive systems are well developed and both the cirrus and vagina are armed with relatively large triangular spines. The genital pore is located in the mid-ventral region just posterior to the forking of the intestine. The cirrus sac is elongate and extends from the genital pore to a short distance posterior to the ventral sucker. It encloses a seminal vesicle, numerous "prostate" cells, and a spined cirrus. The two testes are laterally situated about half-way between the ventral sucker and the posterior end of the body. They are composed of loosely arranged tissue. The single ovary is located just above the testis on the right side of the body. Its margin is irregularly lobate. No seminal receptacle was observed. The coils of the uterus may fill the posterior half of the body, particularly in the region between the testes. The uterus terminates anteriorly at approximately the middle of the median surface of the vagina. The vagina is relatively thick-walled, and is spined throughout its entire length. It is quite large, measuring approximately 0.0224 mm. wide by 0.0332 mm. long. It generally lies on the left side of the body. The spines arming the vagina are similar in shape and size to those found in the cirrus. The



eggs are amber-colored, oval in outline, operculate, and measure about 0.016 mm. long by 0.011 mm. wide. Mature eggs were removed from the uteri of several worms and were kept for over three weeks under conditions favorable for hatching but very little change took place in them. This suggests that the eggs must be eaten by the clam host before development will proceed.

The adult *Monorcheides cumingiae* differs from the other members of the genus in the following ways. The size of the body, suckers, pharynx, and eggs is smaller in *M. cumingiae* than in any other member of the genus. The shape of the vaginal and cirrus spines is triangular in *M. cumingiae* but in the other species, judging from figures, they are much more elongate. The spines of the cirrus of *M. cumingiae* are uniform in size while in *M. diplorchis* Odhner the spines on the median side are longer than those found on the lateral side of the cirrus. The vitellaria of *M. soldatovi* Issaitschikow extend from the posterior border of the pharynx to the level of the middle of the ovary, in *M. diplorchis* the yolk glands extend from the level of the forking of the intestine to a short distance posterior to the anterior margin of the ovary, while in *M. cumingiae* these glands may extend from the posterior margin of the ventral sucker to the anterior margin of the testes. *Monorcheides* (?) *petrowi* Layman probably does not belong to this genus at all because the ovary is posterior instead of anterior to the testes. The genus *Paramonorcheides* Yamaguti is closely related, if not synonymous, with the genus *Monorcheides*. The principal difference between the two seems to be a sac-shaped excretory bladder in the former and a Y-shaped one in the latter. Some specimens of *Monorcheides cumingiae* give the appearance of having a Y-shaped bladder due to the distention of the lower portions of the main collecting ducts. It is likely that Odhner believed that these enlarged collecting ducts were continuations and part of the bladder.

Nagano (1930), according to Yamaguti (1938), has shown that the larval form of *Asymphylodora tincae* is a tailless cercaria, or the so-called cercariaeum, lacking eyespots. It is apparent, therefore, that there are at least two larval types in the family. The larval form of the genus *Bivesicula* Yamaguti 1934 is evidently similar to the cercaria of *Monorcheides cumingiae* in the possession of eyespots since remnants of these structures are found in the adults.

Monorcheides decapteri n. sp.
(Figs. 3–4)

Host: Decapterus pinnulatus (Eydoux & Souleyet), opelu (Carangidae); 1 specimen in 1 of 3 hosts.

Location: Intestine.

Holotype: U. S. Natl. Mus. Helm Coll., No. 39465.

Description: Length 1.192; greatest width near midbody, 0.435; body tapering toward each end to rounded point. Body spines lost; eye spots not evident. Oral sucker 0.08 wide; acetabulum weakly developed, just behind midbody (forebody 0.603), 0.077 wide; sucker ratio 1: 0.96, or subequal. Pharynx small and weak, spherical, 0.034 in diameter; prepharynx slightly longer than pharynx; esophagus long and slender, about 0.25 long; ceca little divergent, slender, extending to near end of cirrus sac on one side, or little past cirrus sac on other. Left testis very long, 0.335 by 0.1, to left of midline extending to near posterior end of body. Right testis not clear, degenerate, testicular cells in region opposite left testis. Cirrus sac large, curved, its proximal end touching anterior fourth of testis, containing an ovoid seminal vesicle, numerous prostatic cells, and spined cirrus; cirrus less than one-third length of cirrus sac; posterior (or mesial) spines long and slender, anterior (or outer) spines thorn-shaped (fig. 4). Ovary irregular in outline, extended laterally, almost bilobed, in middle fourth of body, to right of left testis, overlapping base of cirrus sac. Vitelline follicles ovoid to elongate, in middle fourth of body, about 20 follicles on left extending to midline and overlapping acetabulum, about 9 follicles on right side; vitelline ducts large, meeting a little posterior to ovary; seminal receptacle not seen, probably lacking as in most monorchids. Uterus not extending posterior to testes, overlapping left testis ventrally, with relatively few eggs. Eggs 19 to 21 by 11 to 14 microns. Terminal organ with subspherical vesicle, to left of curve of cirrus sac, spined with needle-like spines which continue into metraterm. Genital pore inconspicuous, median, just anterior to acetabulum. Spines in genital atrium few. Excretory pore ventral, subterminal, stem very short; vesicle apparently Y-shaped.

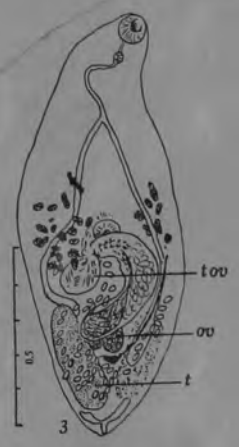
Discussion: The genera *Monorcheides* and *Paramonorcheides* are very similar except for the shape of the execretory vesicle, supposedly V- or Y-shaped in *Monorcheides* and I-shaped or sac-shaped in *Paramonorcheides*. Among most trematodes, this difference would be important, but Martin has suggested (1940) that in this family the collecting vessels near the vesicle may swell to resemble forks of the vesicle itself. In *Paramonorcheides* much of the uterus is posttesticular; in *Monorcheides*, all or most of the uterus is pretesticular.

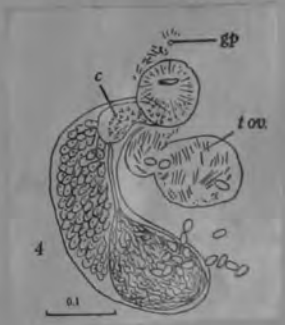
M. decapteri differs from all other species in the genus by its very long forebody and esophagus. In spite of the probable occurrence of two testes in *M. decapteri*, the species shows considerable similarity to *Telolecithus tropicus* Manter, 1940 from a related host from the west coast of Panama. In both species there is a long forebody and esophagus, elongate testis, irregularly shaped ovary, uterus not extending posterior to testis, spined metraterm and cirrus, and Y-shaped excretory vesicle.

Yamaguti (1958) moved *T. tropicus* to the genus *"Pristisomum"* which he considered the equivalent of *Postmonorchis* Hopkins, 1941. As noted above, we do not accept the genus *Pristisomum*. *T. tropicus* has a number of differences from other species of *Postmonorchis* and should be placed in a separate genus to which we give the name *Chrisomon* (masculine, derived as an anagram from the word *Monorchis*).

Diagnosis of Chrisomon: Monorchiinae. Body elongate; esophagus more than twice length of pharynx; testes single, elongate, near posterior end of body; cirrus and metraterm spined; ovary irregularly lobed; vitellaria of numerous follicles, not reaching acetabulum; uterus not extending posterior to testis; excretory vesicle apparently Y-shaped with very short stem. Type species: *C. tropicus* (Manter, 1940) n. comb. (syn. *Telolecithus tropicus*).

Manter & Pritchard, 1961

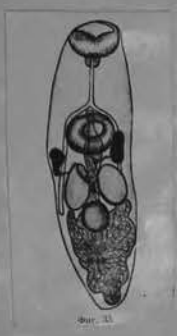




Monorcheides (?) petrowi Layman 1930

Length 0.983 mm., width 0.25 mm.
Oral sucker 0.1639 mm. wide.
Ventral sucker 0.147 mm. long.
Pharynx 0.049 mm. long. Esophagus 0.18 mm. long.
The ceca end the the level of the anterior edge of the ovary.
Seminal vesicle extends somewhat posterior to the ventral suck.
Vitellaria compact, to the side of the ventral sucker.
Ovary behind the testes. Length of ovary 0.08 mm.
Genital pore in front and in the region of the ventral sucker.
Left testis 0.163 mm. Right testis 0.180 mm.
Uterus extends into posterior part of body.
Eggs 29.7 by 13.5 μ
Possibly this form does not belong to Monorcheides but to a new genus.

Host: Osmerus eperlanus dentex , pyloric ceca
Frequency: Two specimens in one fish, of 13



Monorcheides popovicii Szidat,1950

0.5 to 0.8 by 0.36 to 0.4 mm.
0.5 specimen:
oral sucker 0.12; acetabulum 0.1; ratio 1.2:1
(in Arctic species it is 1.5:1)
pharynx 0.05 in diameter
esophagus almost lacking
Ceca not well seen
Testes symmetrical, ovoid, in lateral parts of posterior half of body
Cirrus sac well developed extending slightly past acetabulum; containing seminal vesicle and a cirrus armed with triangular spines.
Ovary large, 3-lobed, on the right, close to and anterior to right testus.
Vitelline follicles large, few, dorsal to testes, overlapping ovary, less extensive than in other species.

Eggs 30 to 32 by 20 u
Host: Eleginops maclovinus
Tierra del Fuego, Argentina

2. **Monorcheides popovicii** n. sp.
(Figuras 2 y 3)

Este trematode se encuentra casi siempre en gran número en los tro apéndices pilóricos del Robalo, y en algunos casos, ya en la te anterior del tracto intestinal. Representa un caso curioso, porque la puede comparar con la especie *norcheides diplorchis* Odhner 1905, en intestino de *Lumprenus medius* pro- lente de la costa oeste de Spitzbergen con *M. soldatovi* Issait. 1928, encon- do por Issaitschikow en *Aspidopho- ides olriki* Lütkin del Mar Ártico so.

La forma y el tamaño de las tres espe- s del género, se presentan casi simi- res y lo mismo puede afirmarse de su ganización interna. La diferencia re- de principalmente en el tamaño de s ventosas, la situación de los folícu- s vitelógenos y el tamaño de los evos.

La longitud del cuerpo, oviforme, lastado y espinoso, alcanza en los emplares adultos, de 0,5 a 0,8 mm; ancho de 0,36 a 0,4 mm.

Fig. 2. *Monorcheides popovicii* n. sp. de los apéndices pilóricos de *Eleginops maclovinus* (Cuv. & Val.).

Un ejemplar con un largo de 0,5 mm con el útero bien relleno de evos, tuvo las siguientes dimensiones:

Largo: 0,5 mm; ancho: 0,36 mm. El diámetro de la ventosa bucal es 0,12 mm, de la ventosa ventral, 0,1 mm. La relación de la ventosa ucal con la ventral es, por lo tanto, de 1,2:1, en las dos especies la región polar ártica, ella es de 1,5:1.

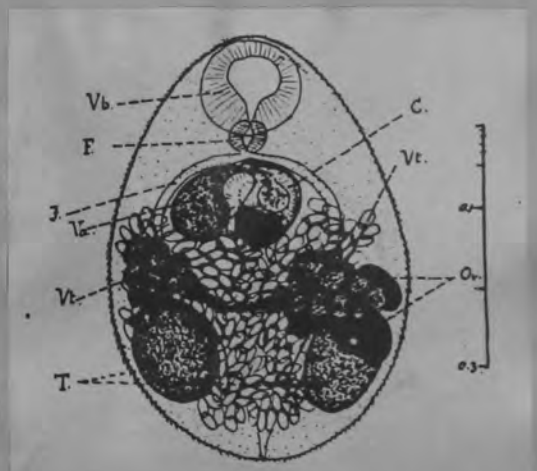


Fig. 3. — *Monorcheides popovicii* n. sp. Visto desde la parte dorsal.

Monorchidae Odhner 1911

Monorcheides popovicii n.Sp. Lothar Szidat, 1949.

This trematode is almost always found in large numbers in the pilorác appendages of the Snook, and in some cases, in the anterior digestive (intestinal) tract. It represents a curious case because it may be compared with Monorcheides diplorchis Odhner,1905, from the intestine of Lumprenus medius from the coast of Spitzbergen with M. soldatovi Issait, 1928 found by Issaitschikow en Aspidophoides olriki Lutkin from the russian arctic.

The shape and the size of the three species in the genus are very similar and the same may be said about the internal organization. The main difference in in the size of the suckers, the location of the viteline follicles, and the size of the eggs.

The body length, oviform, flattened and spinous reaches in adult specimens from 0.5 to 0.8 mm; and 0.36 to 0.4 mm in width.

A specimen with a length of 0.5 mm, with the uterus well filled with eggs measured the following:
Length: 0.5 mm; width 0.36 mm. The diameter of the ~~ventral~~ oral sucker is of 0.12mm, the ventral sucker, o.1 mm. The relation of the ~~ven~~ oral sucker with the ventral sucker is, then, 1.2:1, in both species from the arctic polar region it is 1.5:1.

The pharynx that follows the ~~ventral~~ oral sucker measures0.05 mm in diameter. In contrast with the species from the north, the esophagus is almost lacking. The intestinal caecae are not very well developed and do not reach the posterior extremity. In the inferior part they (caecae) are covered with uterine branches. As in the other two species, there are two testes situated simetrically in the lateral parts of the posterior half of the body. The cirrus sac, well developed, exceeds a little the posterior margin of the ventral sucker. It contains a seminal sac which is spherical and its cirrus is densley covered with triangular spines.

The ovary is large and trilobate, and is found in the right side of the body in the immediate proximity and above of the right testis. The vitelline gland has only some large follicles, situated dorsal to the testes. From the dorsal view the follicles enter in the right side and superimpose the ovary. Forward of this the specimens did not have extensions as did the other two species.

The uterus has a few branches on both sides of the body, above the testicles, it prolongs itself along thesesagitally almost to the extremity of the body, that is to say it has the same course as that found in M. diplorchis and in M. soldatovi.

The eggs of a clear yellow colour with a strong covering, measure from 0.03 to 0.032 mm in length, and are then, larger than those of the other two species of which their measurements are : for M. diplorchis Egg length 0.026-0.028 egg width 0.014-0.015 mm. and for M. soldatovi Egg length 0.0248-0.0257, egg width 0.0183-0.0202 mm.

Host. Eleginops maclovinus (Cuv. & Val.)
Pyloric appendages.

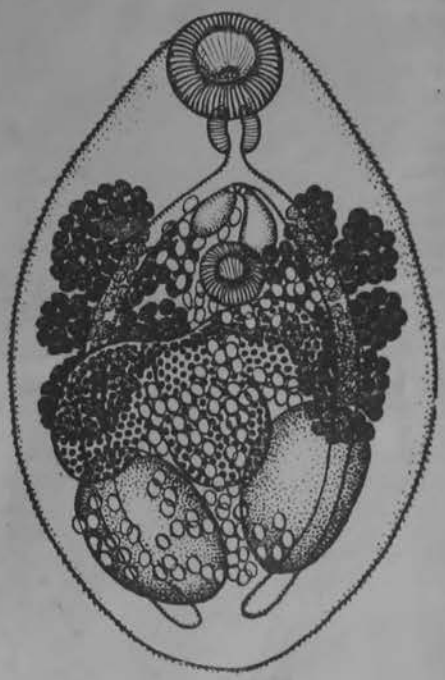
Monorcheides soldatovi Issaitschikow,1928

Host: Aspidophoroides olriki in Russian Arctic

Рис. 13.

Monorcheides soldatovi Issaitschikoff,1928

Host: Aspidophoroides olrici



MONORCHEIDES

Monorchicestrahelmins n. g.

Generic diagnosis: Monorchiidae, Lasiotocinae. Body elongate, tapered anteriorly. Oral sucker terminal, with ventroterminal aperture. Prepharynx practically absent; pharynx small; esophagus long, bifurcating some distance anterior to acetabulum; ceca terminating at different levels near posterior extremity. Acetabulum very small, in middle third of body. Testes single, oval, immediately postacetabular. Cirrus pouch elongated claviform, curved, enclosing saccular seminal vesicle, well differentiated fusiform pars prostatica and spined ejaculatory duct. Genital atrium spined, opening in front of acetabulum. Ovary round, anterodextral to testis. Seminal receptacle large, posterolateral to ovary. Main bulk of uterus occupying greater anterior part of intercecal field; terminal organ unipartite, swollen at middle, covered inside with acicular spines, with its proximal portion drawn out posteriorly to unite with uterus. Vitellarian follicles forming symmetrical extracecal bunches in ovariotesticular zone. Excretory vesicle tubular, receiving main collecting vessels at its anterior end. Intestinal parasites of marine teleosts.

Type species: *M. lethrini* (Yamaguti, 1953) n. comb. (Fig. 211), syn. *Lasiotocus l.* Y., in *Lethrinus* sp., *Diagramma* sp.; Macassar, Celebes. 1.35-2.4 X 0.26-0.36 (21-25 X 13-15).

This genus differs from *Cestrahelmins* Fischthal, 1957, chiefly in body shape, single testis, longer ceca, small acetabulum, spined genital atrium, and in the esophagus bifurcating some distance anterior to the acetabulum. The host relationships are also different.

MONORCHIIDAE Odhner, 1911

GENOLOPA

9. *Lasiotocus lethrini* n. sp (Yamaguti, 1953) Thomas, 1959 to Genolopa

Pl. I, Fig. 4.

Habitat. Small intestine of *Lethrinus* sp. (type host) and *Diagramma* sp.

Material and locality. 4 gravid specimens from the first host and five more from the second host; fixed in acetic sublimate, stained and mounted as usual; Macassar.

Body delicate, elongate, somewhat fusiform, 1.35–2.4 mm in length, with maximum breadth of 0.26–0.36 mm in acetabulotesticular region; forebody slender, with a long neck; hindbody tapering toward posterior end which is pointed in the well extended type but stumpy and corrugated in contracted paratypes. Forebody longer than hindbody, but may be shorter when contracted. Cuticle thin, beset with minute spines. Oral sucker terminal, 0.09–0.14×0.11–0.16 mm. Prepharynx very short or practically lacking. Pharynx 36–60×57–72 μ. Esophagus narrow, 0.13–0.5 mm long, bifurcating at about junction of anterior with middle third of body. Ceca narrow, terminating at different levels some distance from posterior extremity. Acetabulum 75–100 μ in diameter, anterior or posterior to middle of body.

Testis oval, 0.27–0.36×0.1–0.22 mm, posterodorsal to acetabulum. Cirrus pouch thin-walled, 0.44–0.6 mm long by 68–100 μ broad, containing oval to elliptical vesicula seminalis, pars prostatica surrounded by well developed prostate cells, and cirrus, extending arcuately from dorsal side of ovary to genital atrium, with height of convexity immediately behind cecal bifurcation. Cirrus occupying half length and almost entire breadth of cirrus pouch, covered throughout with sharp spines which are up to 20 μ long at the proximal end of the cirrus and become gradually smaller toward the genital atrium. Between the cirrus and the pars prostatica is a short narrow ductus ejaculatorius. Genital atrium covered inside with spines similar to those of the female terminal organ, opening a little in front of acetabulum.

Ovary oval, entire, 80–150×70–100 μ, situated between testis and proximal end of cirrus pouch. Receptaculum seminis and Laurer's canal absent. Uterus winding between cirrus pouch and posttesticular region, covering testis and ovary ventrally, leaving a considerable free space at posterior end of body. Receptaculum seminis uterinum conspicuous. The terminal portion of the uterus lying in the concavity of the cirrus pouch leads by a very narrow passage into the retort-shaped terminal organ 45–72 μ wide, which lies alongside the distal portion of the cirrus pouch and is covered with spines 5–11 μ long. These spines are less numerous than those of the cirrus, but extend directly into the genital atrium. Eggs oval, embryonated, measuring 21–25×13–15 μ in mounted condition. Vitellaria divided into few coarse lobules, extending on dorsolateral sides from level of posterior portion of cirrus pouch to level of testis.

Excretory vesicle subcylindrical, about 0.15 mm long by 35 μ wide when extended, giving off a pair of collecting vessels at its anterior end; pore terminal.

This species is characterized by the armature of the cirrus and of the terminal organ, and by the latter organ being connected with the uterus proper at its proximal end. That the uterine coils do not extend to the posterior extremity is also worth noting.

I take this opportunity to correct the lapsus calami made on page 386 in my paper of 1934. For *P. elongatum* read *P. plectorhynchi*.

Lasiotocus plectorhynchi (Yamaguti, 1934)

Monorchicestrahelmins