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Capsalids (Monogenea: Capsalidae) of Some Australian Fishes

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CAPSALIDS (MONOGENEA:CAPSALIDAE) OF SOME AUSTRALIAN FISHES

by

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ABSTRACT

From March through July of 1962, 1909 specimens of 119 species of fish were collected from the marine waters of Australia. At present, a total of 1266 specimens representing 93 species have been examined for monogenetic trematodes. Of these, six host species were parasitized by ten capsalids (Monogenea:Capsalidae) and two different host species were parasitized by two species of monocotylids (Monogenea:Monocotylidae).

Six capsalids from five host species are discussed herein. Five, Sprostonia longiphallus n. sp., Allosprostonia tauvinae n.gen., n. sp., Neobenedenia wilsoni n. sp., Benedeniella cystovarina n. sp., and Benedenia anteropulvi n. sp., are described for the first time. One species, Macrophyllida antarctica (Hughes, 1928) Johnston, 1929, is redescribed. Four new hosts for monogenetic trematodes are reported.

The subfamily Trochopodinae (Price, 1936) Sproston, 1946 is emended to accommodate the new genus Allosprostonia. The genus Sprostonia Bychowsky, 1957 is emended to accommodate the new species Sprostonia longiphallus and the genus Macrophyllida Johnston, 1929 is emended in order to correct Yamaguti's (1963) diagnosis of the genus. The taxonomic relationships of the genera of the subfamilies Trochopodinae (Price, 1936) Sproston, 1946 and Benedeniinae Johnston, 1931 are discussed.

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Comparisons of host-parasite relationships indicate a high degree of host-specificity. Of the six parasite species studied only one occurred on more than one host species in the collection.

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INTRODUCTION

This thesis is based on microscopic examinations and systematic considerations of monogenetic trematodes (Order Monopisthea Carus, 1863) collected from the gills of certain marine fishes of Australia.* These collections consisted of 1000 host individuals representing 119 species. A total of 1200 specimens representing 93 species have been examined by various members of the Parasitology Section for monogenetic trematodes. Of these, six host species were parasitized by ten species of capsalids (Monopisthea:Capsalidae) and two different host species were parasitized by two species of monocotylids (Monopisthea:Monocotylidae). Thus, only 12 species of monogenoids belonging to the superfamily Capsaloidea Price, 1936 have been recovered from those marine fishes of Australia examined thus far.

Six species of capsalids from five host species are discussed herein, five of the parasite species being new to science (Table 0). The others mentioned above will be the subjects of later works.

Examination of the literature reveals that in comparison to the total number of hosts and monogenoids reported

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little is known about the monogenoid fauna of the Australian area. MacCallum (1917), Johnston and Tiegs (1922), Hughes (1928), Johnston (1929, 1930a, 1930b, 1931, 1934a, 1934b, 1937), Murray (1931), Woolcock (1936), and Sanders (1964, 1965, 1967) have described or reported monogenetic trematodes from fishes of Australian waters. Robinson (1961) noted that the majority of Monogenea known from the Southern Hemisphere were reported from Australia. Other works concerning Monogenea from the Southern Hemisphere are as follows: Brinkmann (1952) and Cordero (1944) from Chile; Hunter and Prince (1953) and Laird (1953) from Fiji and the New Hebrides; and Blanchard (1847), Johnston (1931), Hunter (1955), Hunter and Walling (1958), Robinson (1961), and Dillon and Hargis (typescripts) from New Zealand. Up to the present time a total of 47 species of monogenetic trematodes has been reported from Australian waters, 12 of these being reported by Johnston and Tiegs (1922) from fresh water fishes. The parent collection from which the present specimens were drawn is probably more extensive in numbers of individual hosts and host species and the geographical area covered than any of the works of the Southern Hemisphere mentioned above.

The research reported herein is a continuation of a long range study of certain aspects of host-specificity, zoogeography, and phylogeny of monogenetic trematodes being conducted by members of the Parasitology Section of the Virginia Institute of Marine Science.

MATERIALS AND METHODS

Most collections were made near Gladstone, Queensland; Dunalley, Tasmania; Port Hommey, South Australia; and Carnarvon, Western Australia. The fish were procured from commercial fishery operations in which hand lines, trawls, gill nets, and Danish seines were used. Mr. William Stanley Wilson and Mr. William Saunders, the field collectors, accompanied the vessels and took the host specimens as they came on board. Collections were made from March through July of 1962.

Mr. Wilson identified the fish with the aid of experienced fishing vessel captains and using the keys and descriptions of Waite (1921), Gotham (1956), Parrott (1957, 1958, 1959), and Roughley (1953). Since the vessel captains could help with or verify identifications, and since all species captured are relatively common, it is believed that host identifications are reliable. Scientific names of hosts are those given by Waite (1958), Roughley (1953), and Parrott (1959).

In the locality descriptions given below, the nearest town or prominent geographical feature and its province are given first, followed by the approximate site of capture of the host. The place of capture is followed by the depth and bottom type in parentheses. Distance is in statute miles.

The monogenetic trematodes were collected using a procedure outlined by Hargis (1953). The use of this technique results in specimens which are believed to be more normal in external and internal morphology than those prepared by pressure-fixation techniques. This technique works best when the gill arches are separated from each other before immersion in the relaxant. However, according to Mr. Wilson, such separation was generally not possible because of trying shipboard conditions. As a result, relaxation of worms on internal gill surfaces not readily bathed by the Chloretone-sea water solution was somewhat variable. Such unevenness of relaxation probably also resulted from the varying physiological conditions of the worms themselves at the time of killing, since all hosts could not be processed at the same time. The trematodes were then killed, fixed, and preserved by adding AFA (aceto-formalin-alcohol). This technique has proven advantageous when collecting large numbers of hosts as it facilitates rapid handling.

The parasites were removed from the gill material and sediment with the aid of a stereomicroscope and stored in vials containing a solution of 5% glycerol in 70% ethanol.

For preparation of whole mounts the worms were removed from the preservative, hydrated, overstained, destained, dehydrated, cleared, and mounted. The parasites were stained with one of the following: (1) Reynolds' double stain (Delafield's hematoxylin plus alum cochineal); (2) alum

cochineal; (3) Harris' hematoxylin; and, (4) Harris' hematoxylin with either sodium bicarbonate for "bluing" or eosin as a counterstain. As many stains as possible were used on each species to study the various internal and external structures. The following results were obtained: (1) Reynolds' double stain was an excellent stain for the internal structures and glands. (2) Alum cochineal proved to be a good general stain, but sometimes was too diffuse and obscured some of the internal structure. (3) Harris' hematoxylin and Harris' hematoxylin plus sodium bicarbonate proved effective for reproductive structures. (4) Harris' hematoxylin with eosin as a counterstain proved good for reproductive structures and was especially useful on the septation of the posthapter. If few worms were available, only alum cochineal and/or Reynolds' double stain were used.

The worms were overstained and immediately destained using a solution of two to four drops of concentrated HCl in 30% ethanol. This procedure afforded better control of the amount of stain retained by the specimen than progressive staining. After dehydration, the worms were cleared in deacidified beechwood creosote and mounted permanently in Piccolyte. Xylene proved to be a poor clearing agent as it made specimens brittle and hard to manipulate when mounting.

Only those specimens which were well-colored and possessed clear morphological characters were used for identification and study. Diagnoses and descriptions were based on adult individuals, sexual maturity being the criterion for adulthood. Sexual maturity was determined by either (1) the presence of an egg *in utero*, (2) attainment of the same approximate size and morphological condition as individuals with eggs, or (3) by the apparently mature condition of the gonads (especially the ovary) where no egg was observed.

All measurements were made with the use of a filar micrometer and are given in millimeters. In indicating these measurements the mean is given, followed by the range (minimum and maximum) in parentheses. In cases where more than five specimens were measured, the standard deviation (S), standard error ($S_{\bar{x}}$), AND the interval estimate at the 95% level ($t_{.05}S_{\bar{x}}$) follow the range. For convenience the alphabetical symbols SE and CL are established for standard error ($S_{\bar{x}}$) and confidence limits or interval estimate at the 95% level ($t_{.05}S_{\bar{x}}$), respectively. The number of measurements used in the calculations appears in parentheses before these data. Measurements of curved structures were across the lines subtending the greatest arcs described by these structures. All egg measurements were taken of the main portion of the egg capsule, exclusive of the filament. The value of filament length as a taxonomic character is doubtful since great variation occurs within a species.

Measurements of soft parts, which are subject to contraction and expansion in life and shrinkage in death, can be considered of value for comparison only when specimens have been similarly treated or where differences between individuals or groups of individuals being compared are great. Measurements of hard parts are thought to be free of such vagaries and are considered more reliable as taxonomic characters. Camera lucida and microprojector drawings were used to facilitate identification and in the preparation of figures.

The taxonomic scheme employed is essentially that of Sproston (1946) and Yamaguti (1963). The work of Dychowsky (1957) has also been considered and his conclusions discussed where possible.

The morphological terminology used in the descriptions is that of Harris (1950), who compiled a list of useful terms from the works of Price (1934-1943), Sproston (1945-1946), Yamaguti (1946), and his own studies.

RESULTS AND DISCUSSION

Order Monogenea Carus, 1863

Suborder Monopisthocotylea Odhner, 1912

Superfamily Capsaloidea Price, 1936

Family Capsalidae Baird, 1853

Subfamily Trochopodinae (Price, 1936) Sproston, 1966 *emend.*

Synonyms: Trochopinae Price, 1936

Megalocotylinae Bychowsky, 1957

DIAGNOSIS: Capsalidae. Diagnosis the same as that of Yamaguti (1963) except as follows: (1) pharynx with or without constrictions; and, (2) common genital opening marginal or very close to margin behind left prohaptor.

TYPE GENUS: *Trochopus* Diesing, 1850

DISCUSSION: The above emendation is made to accommodate *Alloprostonia taurinae* n. gen., n. sp. In addition, the figure of *Sprostonia squatinae* (MacCallum, 1921) Bychowsky, 1957 as illustrated by MacCallum (1921) shows definite constrictions of the pharynx, which Yamaguti (1963) did not take into account in his diagnosis of the subfamily Trochopodinae.

Price (1936) proposed as a new subfamily in the Capsalidae the group Trochopinae for the genera *Trochopus* Diesing, 1850 and *Macrophyllida* Johnston, 1929, and suppressed

Megalocotyle Folda, 1928 as a synonym of Trochopus Diesing, 1850. Upon re-examination of the large number of species of Trochopus, Price (1939a) decided that they fall into two groups and therefore reinstated the genus Megalocotyle Folda, 1928.

Dr. Baylis, in personal communication with Sproston (Sproston, 1946), pointed out that the correct spelling of the subfamily name was Trochopodinae. Sproston (1946) then amended the subfamily and corrected the name according to Dr. Baylis' suggestion.

Bychowsky (1957) split the subfamily Trochopodinae (Price, 1936) Sproston, 1946 into two subfamilies: (1) Megalocotylinae Bychowsky, 1957, with Megalocotyle Folda, 1928 as the type genus, and (2) Trochopodinae (Price, 1936) Sproston, 1946, with Trochopus Diesing, 1850, as the type genus. He did this on the basis of whether there were an unequal or equal number, in the former and latter respectively, of peripheral depressions separated by septa on the posthaptor.

Yamaguti (1963) considered Megalocotylinae Bychowsky, 1957 as a synonym of Trochopodinae (Price, 1936) Sproston, 1946, combining the two. He also proposed two new genera, Allomegalocotyle and Pseudomegalocotyle.

After careful study of generic characters (Table 1) which may be considered taxonomically significant (type of prohaptor, number of septa, position of prostate reservoir)

within the subfamily Trochopodinae (Price, 1936) Gpreston, 1946, the author accepts, with the emendations previously made and to follow, the rearrangement as proposed by Yamaguti (1963).

TABLE 1.

Comparison of the major taxonomic characters separating the genera of the subfamily Trochopodinae

	Trochopus (type genus)	*Megalocotyle*	*Pseudomegalocotyla*	*Allomegalocotyla*	*Macrophyllida*	*Sprostonia*	*Allosprostonia* n. gen.
Type of prohaptor	paired suckers	paired suckers	paired suckers	paired suckers	fan-like glandular areas	paired suckers united by common hood	paired suckers united by common hood
Number of septa	8-12	7	9; 6 lateral bifurcated	7	5	7; postero-lateral trifid or bifid, 4 or 6 incomplete septa	5
Position of prostato reservoir in respect to cirrus pouch	inside	inside	inside	outside	inside	outside	outside

Genus Inrostonia Dychowsky, 1957 emend.

DIAGNOSIS: Caecalidae, Trochopodinae. Diagnosis the same as that of Yamaguti (1963) except as follows: Posthaptor divided by seven primary (connected to central loculus) septa, of which the posterolaterals are either (1) trifid or (2) bifid, and having either (1) four or (2) six secondary (incomplete) septa. Pharynx notched marginally into eight lobes. Vagina opening close to genital pore. Parasitic on elasmobranchs and teleosts.

TYPE SPECIES: Inrostonia aquatinae (MacCallum, 1921) Dychowsky, 1957.

DISCUSSION: The above emendation is made to accommodate Inrostonia longicbellus n. sp. In addition, though not mentioned by Dychowsky (1957), the pharynx of I. aquatinae (MacCallum, 1921) Dychowsky, 1957, as figured by MacCallum (1921) is notched marginally into eight lobes, as is the pharynx of I. longicbellus. Yamaguti (1963) wrote that the vagina opened "close to, or together with, genital pore." The phrase, "or together with," should not be included in the diagnosis, as Price (1937b) stated that the vagina had its opening "immediately posterior to genital aperture," and all specimens of I. longicbellus have vaginal openings close to, and posterior to, genital pore.

The genus Inrostonia Dychowsky, 1957 includes one previously described species, Inrostonia aquatinae (MacCallum, 19-

21) Bychowsky, 1957, which was originally described by MacCallum (1921) as Acanthocotyle aquatinae from the host Squatina squatina (Linn.) from Singapore. Price (1937b) redescribed it as from specimens that MacCallum (1921) used for his original description, renaming it Anchonus aquatinae. Later he (Price, 1939a) transferred it to the genus Neocalcotyle Yolda, 1929. Beverley-Burton (1962), apparently in ignorance of Price's work (1936, 1937b, 1939a), concluded also that its place was in Neocalcotyle Yolda, 1929. Sproston (1946) considered its inclusion in the genus Neocalcotyle Yolda, 1929 as "very doubtful." Bychowsky (1957) isolated this species into the new genus Sprostonia Bychowsky, 1957, on the basis of incomplete notes and more complete notes of the posthaptor and paired anterolateral suckers united anteroventrally by a common hood.

Sprostonia longipheilus n. sp.

(PLATE I, Figs. 1-6)

HOST: Epinephelus tauvina (Forskal), Greasy Cod or Estuary Rock-Cod; family Epinephelidae.

LOCALITY: Gladstone, Queensland; 36 statute miles ENE of Gladstone (9 fathoms, coral).

GEAR USED: Hand line.

LOCATION: Gills.

NUMBER STUDIED: 83.

NUMBER INFECTED: 19.

Holotype: USNM Helm. Coll. No. VIMS Coll. No. P-536-1.

Paratypes: USNM Helm. Coll. Nos.

VIMS Coll. Nos. W-534-1, W-534-8, W-535-2, W-535-30, W-563-21.

DESCRIPTION: Body elliptical, flattened dorsoventrally, (19) 3.65 (2.91 - 4.93), S=0.494, SE=0.113, CL=0.238 long by (19) 1.31 (1.06 - 1.60), S=0.135, SE=0.0310, CL=0.0651 wide. Cuticle fairly thin and smooth. Prohaptor a pair of ventrolateral suckers, united anterodorsally by a common hood; left sucker (15) 0.143 (0.124 - 0.163), S=0.0124, SE=0.00320, CL=0.00687 long by (15) 0.192 (0.156 - 0.231), S=0.0205, SE=0.00530, CL= 0.0114 wide and right sucker (13) 0.141 (0.116 - 0.160), S=0.00953, SE=0.00266, CL=0.00579 long by (13) 0.184 (0.161 - 0.222), S=0.0163, SE=0.00452, CL=0.00986 wide. Region anterior to brain glandular. Posthaptor a subsessile, concavo-convex, oval sucker, opening ventrally, (19) 0.624 (0.516 - 0.829), S=0.0849, SE=0.0195, CL=0.0409 long by (19) 0.790 (0.626 - 0.994), S=0.115, SE=0.0264, CL=0.0554 wide, divided by seven primary (connected to central loculus) septa, the posterolateral bifid, with two secondary (incomplete) septa extending inward from muscular rim subdividing posterior marginal loculus, with a secondary septum dividing each of the anterior and anterolateral marginal loculi; margin of posthaptor a strong muscular rim, surrounded by a delicate, scalloped marginal membrane, (19) 0.0525 (0.0388 - 0.0669), S=0.00850, SE=0.00195, CL=0.00410 wide; armed with three pairs of dissimilar anchors and 14 marginal hooks. Anteriormost anchors large, robust, left one (15) 0.136 (0.108 - 0.165), S=0.0174, SE=0.00449, CL=0.00964

long and right one (16) 0.142 (0.117 - 0.174), S=0.0145, SD=0.00362, CL=0.00771 long, with pointed external tips and blunt internal tips and enlarged in the middle; second pair of anchors elongate, left one (14) 0.0509 (0.0439 - 0.0610), S=0.00539, SD=0.00164, CL=0.00311 long, more robust than third pair with slightly recurved blunt tips; third pair of anchors elongate, left one (14) 0.0554 (0.0469 - 0.0702), S=0.00710, SD=0.00190, CL=0.00410 long, tips recurved and pointed. (Second and third pairs of anchors lie side by side, arising at about the same level on the posthaptor, and are sometimes hard to distinguish one from the other.) Posthaptoral hooks (19) 0.00631 (0.00449 - 0.00816), S=0.000991, SD=0.000227, CL=0.000670 long. Small, round disc-like sclerites sometimes on posthaptor near first pair of anchors.

Pharynx muscular, (19) 0.270 (0.227 - 0.367), S=0.0358, SD=0.00321, CL=0.0172 long by (19) 0.236 (0.184 - 0.281), S=0.0299, SD=0.00635, CL=0.0144 wide, constricted into eight distinct lobes. Mouth subterminal, ventral, immediately anterior to pharynx. Esophagus very short; gut bifurcated, crura with medial and lateral dendritic branching, not confluent posteriorly.

Two testes, juxtaposed, entire, fenestrated, oval in outline, left one (19) 0.328 (0.263 - 0.451), S=0.0536, SD=0.0123, CL=0.0259 long by (19) 0.296 (0.217 - 0.373), S=0.0446, SD=0.0102, CL=0.0215 wide, and right one (19) 0.327 (0.247 - 0.441), S=0.0506, SD=0.0110, CL=0.0244 long

by (19) 0.289 (0.216 - 0.365), S=0.0612, SE=0.00945, CL=0.0199 wide, postequatorial in position. Vasa efferentia anastomosing in midline to form vas deferens, running anteriorly between vagina and base of cirrus pouch to level of distal end of oötype, then turning right and extending posteriorly parallel to cirrus pouch, and running ventral to proximal end of cirrus and across posterior end of prostate reservoir (which it is assumed to enter). Cirrus pouch very long, its proximal end lying to the left of median line and directed anteriorly, extending diagonally across body to right of medial line as far as ovary, then turning anteriorly. Cirrus very long and slender, eversible, coiled in cirrus pouch. Prostate reservoir lying in median field, to right of proximal end of cirrus, and connected to this end by a duct which continues throughout the length of the cirrus as the ejaculatory duct. Prostatic cells around prostate reservoir except for the left side. Cirrus pouch joins uterus near margin to form genital atrium opening to outside via the common marginal genital pore on left at anterior level of brain. Glands of Coto, irregular in outline, on each side of midline posterior to testes.

Ovary immediately pretesticular, oval, entire, median, (19) 0.170 (0.124 - 0.208), S=0.0222, SE=0.00509, CL=0.0107 long by (19) 0.233 (0.187 - 0.270), S=0.0296, SE=0.00679, CL=0.0143 wide, having internal chamber (=seminal receptacle of Meserve, 1938) containing mature ova; oviduct passing from chamber dorsal to right arm of vitelline reservoir and ventral to vas deferens on left until proximal end of cirrus, then

passing dorsal to vas deferens on to oötype. Oötype obliquely situated between cirrus and vagina, surrounded by Mehlis' gland cells; uterus very long, opening into genital atrium. Vagina muscular, very long, wavy near its distal end, its base at level of posterior end of prostate reservoir, opening marginally just posterior to common genital pore; connected by small duct to right side of vitelline reservoir.

Vitellaria follicular, extending from level of anterior part of pharynx to near posterior end of body proper. Transverse vitelloducts fusing to left of median line to form vitelline reservoir immediately anterolateral to ovary. Vitelloducts confluent post-pharyngeally and post-testicularly. Eggs in utero polyhedral, (2) 0.105 long by 0.0740 (0.0685 - 0.0794) wide, with a convoluted basal filament.

"Brain" anterior to pharynx, three pairs of nerves passing into prohaptoral region. Four granular eyespots located dorsal to brain, the first pair smaller and closer together than the posterior pair. Excretory pores at level of anterior end of oötype, opening dorsolaterally.

DISCUSSION: The present species is very similar to Enzootonia aquatinae (MacCallum, 1921) Dychowsky, 1957, from the gills of Aquatina aquatina (Linn.), but differs in the following respects: (1) Glands of Goto present; (2) vitelloducts confluent post-pharyngeally and post-testicularly; (3) testes fenestrated; (4) posterolateral septa bifid instead of trifid; (5) second and third pairs of anchors larger (Table 2); (6) prohaptoral

suckers larger (Table 2); (7) egg smaller (Table 2); (8) vas deferens passing dorsal to left arm of vitelline reservoir and also ventral to prostate reservoir, which it apparently enters; (9) proximal end of vagina more anterior and also connected by a small duct to the right side of the vitelline reservoir; and, (10) host.

The septation of the posthaptor is very close to that described by Price (1937b) for Sprostonia squatinae (MacCallum, 1921) Bychowsky, 1957. The major difference is that the posterolateral septa are bifid instead of trifid. This observation was facilitated by the use of eosin as a counterstain on several specimens. It is possible that Price (1937b) observed atrophied rays deprived of special musculature passing from the anterolateral secondary septa to the posterolateral bifid septa. Such rays were observed on several of the specimens in our sample.

The anchors of Sprostonia squatinae (MacCallum, 1921) Bychowsky, 1957, which were designated by Price (1937b) as the second and third pairs, appear to be the third and second pairs, respectively. An arrangement similar to that mentioned by Price (1937b) was found in Sprostonia longinhallus n. sp., i.e., a blunt-tipped and a sharp-tipped anchor lying side by side. Since the general arrangement of anchors in the Trochopodinae appears to be that of a connear, blunt-tipped second anchor and a third anchor with a recurved sharp tip, it seems safe to conclude that this is the case in Sprostonia squatinae as

redescribed by Price (1937b). The arrangement of the posterior two pairs of anchors in Sprostonia Bychowsky, 1957 can best be explained by a migration backward of the second anchor pair or a migration forward of the third anchor pair, resulting in their lying side by side.

This description increases the number of species in the genus Sprostonia Bychowsky, 1957 to two. These species are: S. squatinae (MacCallum, 1921) Bychowsky, 1957 (type species) from Squatina squatina (Linn.) (Singapore, Malaysia); and S. lonchiphallus n. sp. from Epinephalus tauvina (Forskal) (Gladstone, Queensland, Australia). This non-rigid host supra-specificity (Hargis, 1957) of Sprostonia Bychowsky, 1957 could possibly represent paleoecological or neoecological relationships between the hosts.

A total of 83 parasites were recovered from seven host specimens (Table 8).

Genus Allosprostonia n. gen.

Allosprostonia tauvinae n. gen., n. sp.

(PLATE II, Figs. 7-10)

HOST: Epinephelus tauvina (Forskal), Greasy Cod or Estuary Rock-Cod; family Epinephelidae.

LOCALITY: Gladstone, Queensland; 36 statute miles ENE of Gladstone (9 fathoms, coral).

GEAR USED: Hand line.

LOCATION: Gills.

NUMBER STUDIED AND MEASURED: 2.

TABLE 2.

Comparison of measurements of *Spreotonia* species

		S. equatinae MacCallum (1921)	*S. equatinae* Price (1937b)	*S. longinhallus* n. sp.
Entire body	(l)	4.30	2.9-3.5	2.91-4.93
	(w)	1.60	1.3-1.5	1.06-1.60
Posthaptor		1.00 (dia)	0.544-0.599 (dia)	(l) 0.514-0.829 (w) 0.626-0.994
Marginal membrane	(w)	----	0.047-0.057	0.0388-0.0669
Anchor 1	(l)	0.140	0.143-0.148	L 0.108-0.165 R 0.117-0.174
Anchor 2	(l)	----	0.024-0.038	L 0.0439-0.0610
Anchor 3	(l)	----	0.042	L 0.0469-0.0702
Hooks	(l)	----	------	0.00449-0.00816
Prohaptoral suckers		----	(l) 0.095 (w) 0.172	L(l) 0.124-0.163 (w) 0.156-0.231 R(l) 0.116-0.160 (w) 0.161-0.222
Pharynx		0.800	0.266 (dia)	(l) 0.227-0.367 (w) 0.184-0.281
Testes		1.12	L(l) 0.400 (w) 0.340 R-dia 0.340	L(l) 0.263-0.451 (w) 0.217-0.370 R(l) 0.247-0.441 (w) 0.216-0.365
Ovary		0.480	0.190 (dia)	(l) 0.124-0.208 (w) 0.107-0.278
Egg		0.140	(w) 0.120	(l) 0.105 (w) 0.0665-0.0794

(l) = length
(w) = width
L = left
R = right
(dia) = diameter

Holotype: USNM Helm. Coll. No.

VIMS Coll. No. H-535-1.

Paratype: USNM Helm. Coll. No.

VIMS Coll. No. H-535-27.

DESCRIPTION: Body elliptical, flattened dorsoventrally, 2.86 (2.62 - 3.10) long by 1.25 (1.14 - 1.36) wide. Cuticle fairly thin and smooth. Prohaptor a pair of ventrolateral suckers, united anterodorsally by a common hood; left sucker 0.142 (0.125 - 0.159) long by 0.161 (0.151 - 0.172) wide and right sucker 0.148 (0.136 - 0.161) long by 0.164 (0.154 - 0.175) wide. Head glands in three major areas; in body between prohaptoral suckers and posterolateral to each sucker. Posthaptor a subsessile, concavo-convex, oval sucker, opening ventrally, 0.607 (0.510 - 0.690) long by 0.782 (0.712 - 0.851) wide, divided by five septa into one central and five peripheral depressions (loculi); margin of posthaptor a strong muscular rim, surrounded by a delicate, scalloped marginal membrane 0.0492 (0.0465 - 0.0518) wide; armed with three pairs of dissimilar anchors and 14 marginal hooks. Anteriormost anchors large, robust, left one of larger specimen 0.120 long and right one of larger specimen 0.122 long, with pointed external tips and blunt internal tips and enlarged in the middle; second pair of anchors elongate, left one of larger worm 0.0751 long and right one of smaller worm 0.0653 long, more robust than third pair with slightly recurved blunt tips; third pair of anchors elongate, left one of larger worm 0.0618 long and right one of smaller worm 0.0700 long, tips recurved and pointed. (Second and third pairs of anchors lie

side by side, arising at about the same level on the posthaptor, and are sometimes hard to distinguish one from the other.) Posthaptoral hooks 0.00612 long. Small, round, disc-like sclerites on posthaptor near first pair of anchors.

Pharynx muscular, 0.168 (0.163 - 0.172) long by 0.215 (0.204 - 0.226) wide, constricted (or notched) into five distinct lobes, papillated internally. Mouth subterminal, ventral, immediately anterior to pharynx. Esophagus very short; gut bifurcated, crura with medial and lateral dendritic branching, not confluent posteriorly.

Two testes, juxtaposed, entire, fenestrated, oval in outline, left one slightly larger, 0.483 (0.471 - 0.494) long by 0.324 (0.319 - 0.330) wide and right one 0.468 (0.454 - 0.482) long by 0.301 (0.293 - 0.309) wide, equatorial in position. Vasa efferentia anastomosing in midline to form vas deferens, proceeding anteriorly dorsal to left margin of ovary and left arm of vitelline reservoir and vagina whence it turns right and passes dorsal to cirrus pouch, entering it near the proximal end. Vas deferens convoluted from level of ovary to proximal end of vagina, where it straightens out. Seminal vesicle a continuation of the vas deferens on the ventral side of the cirrus. Cirrus obliquely situated just posterior to pharynx, 0.293 (0.281 - 0.304) long by 0.0707 (0.0700 - 0.0714) wide. Cirrus complex consisting of cirrus and seminal vesicle in cirrus pouch. Prostate reservoir separate from cirrus complex, on right side of body extending

longitudinally between proximal end of cirrus pouch and ovary, containing strongly developed prostatic cells; duct passing from anterior end of prostate reservoir around proximal end of cirrus and continuing ventrally on cirrus. Prostatic cells around prostate reservoir except for left side. Uterus connecting to cirrus pouch immediately at distal end of cirrus forming a genital atrium opening outside via the common submarginal genital pore on left above level of pharynx. Glands of Goto on each side of the midline immediately posterior to testes.

Ovary pretesticular, oval, entire, median, 0.173 (0.153 - 0.192) long by 0.196 (0.163 - 0.229) wide, having internal chambers (=seminal receptacle of Reisorve, 1938) containing mature ova; oviduct passing from internal chambers dorsal to right arm of vitelline reservoir and connecting to duct coming from right side of reservoir, proceeding anteriorly to oötype. Oötype obliquely situated between cirrus and vagina, surrounded by Mehlis' gland cells; uterus short, opening into genital atrium. Vagina in two distinct parts, muscular portion passing anteriorly to distal end of oötype, where after turning left and forming a bulb directly posterior to common genital pore it continues to submarginal pore as a small wavy duct; probably connected via a small duct to anterior end of vitelline reservoir.

Vitellaria follicular, extending from level of anterior pair of eyespots to near posterior end of body proper.

Transverse vitelloducts fusing medially to form vitelline reservoir immediately anterolateral to ovary. Transverse vitelloduct separating ovary from testes. Egg polyhedral, 0.136 long by 0.125 wide, with a convoluted basal filament *in utero*.

"Brain" anterior to pharynx; three pairs of nerves passing into prohaptoral region. Four granular eyespots located dorsal to brain, the first pair smaller and closer together than the posterior pair. Excretory pores posterior to level of proximal end of vagina, opening dorsolaterally.

Genus *Alloerostonia* n. gen.

DIAGNOSIS: Trochopodinae. Body elliptical, flattened dorsoventrally. Prohaptor a pair of anterolateral suckers united anterodorsally by a common hood. Posthaptor subsessile, with scalloped marginal membrane; its ventral surface divided by five septa into central loculus and five peripheral loculi. Three pairs of dissimilar anchors (posterior two pairs lying side by side) and 14 marginal hooks. Two pairs of eyes present. Pharynx constricted (or notched) into five distinct lobes. Intestinal crura with medial and lateral dendritic branches, not confluent posteriorly. Testes fenestrated, juxtaposed. Vas deferens winding forward and then slightly backward to join seminal vesicle in cirrus pouch, which is medium in length. Prostatic reservoir strongly developed, outside of and connected to cirrus pouch. Cirrus short. Genital atrium opening very close to left margin of body below left pro-

haptor. Ovary oval, median, pretesticular, separated from testes by a transverse vitelloduct. Ootype surrounded proximally by Mehlis' gland cells; uterine egg with a single, convoluted polar filament. Vagina fairly long, tubular, slightly swollen proximally, narrowed to small duct distally, and united with vitelline reservoir by a narrow duct; opening close to genital pore submarginally. Vitellaria co-extensive with intestinal branches; vitelline reservoir large, immediately anterolateral to ovary. Parasitic on marine teleosts.

TYPE SPECIES: Allosprostonia tauvinae n. sp.

DISCUSSION: Allosprostonia n. gen. varies from every other group of the subfamily Trochopodinae (Price, 1936) Sproston, 1946 in characters that are presently regarded as generic in rank. These characters are as follows: (1) the posthaptor is divided by five septa into one central and five peripheral loculi, the three pairs of anchors being located on the posterior two septa; (2) the prohaptor consists of a pair of anterolateral suckers united anterodorsally by a common hood; (3) the genital openings are slightly submarginal; and, (4) the pharynx is constricted into five lobes.

Allosprostonia tauvinae n. sp. is apparently related to Sprostonia Bychowsky, 1957 in that it also possesses: (1) a pair of anterolateral suckers united anterodorsally by a common hood; (2) strongly developed prostate reservoir lying longitudinally between the cirrus and the ovary; and, (3) three pairs of dissimilar anchors similar in shape and

location (the posterior two pairs lying side by side). It is also of significance to note that Allocreostonia tauvinae n.sp. was found on the same host as Incrostonia longiphallus n. sp. Although Macronhyllida antarctica (Hughes, 1928) Johnston, 1929 has five septa, its septa are more weakly developed (see redescription below) and the posterolateral septa do not possess anchors, the anchors being located in the posterior loculus on atrophied rays deprived of special musculature (Johnston, 1929). The five septa of Allocreostonia tauvinae n. sp. are considered homologous to the five septations of Incrostonia Dychowsky, 1957 which originate from around the central loculus. Due to the previously mentioned similarities between Macrostonia Dychowsky, 1957 and the present species and their apparent close relationship, the name Allocreostonia tauvinae n. gen., n. sp. is proposed.

A total of two parasites were collected from seven host specimens (Table 8).

Genus Macronhyllida Johnston, 1929 emend.

Synonym: Macronhylla Hughes, 1928

DIAGNOSIS: Trochopodinae. Diagnosis the same as that of Yamaguti (1963) except as follows: (1) posthaptor bearing three pairs of anchors, of which the anterior is on the junction of the posterior septa with that surrounding the central loculus, and two posterior pairs of anchors in large posterior loculus; (2) vasaefferentia coming from anterior margin of right testis and posterior margin of left testis;

(3) Glands of Ceto present, to left and posterior to right testis; (4) cirrus, uterus, and vagina opening close together into marginal depression on left at posterior level of pharynx; and, (5) vagina opening separately from, but close to, common genital pore.

TYPE SPECIES: Macrophyllida antarctica (Hughes, 1928) Johnston, 1929.

DISCUSSION: The above emendation [illegible] Mustelus antarcticus to correct the generic diagnosis of Macrophyllida Johnston, 1929, as given by Yamaguti (1963).

Hughes (1928) described a new genus and species, Macrophylla antarctica, from the gills of the Gummy Shark, Mustelus antarcticus [illegible] Macrophylla antarctica Bay, Victoria, Australia. She found this species on only two host specimens of about one hundred examined. As the generic name was found to be preoccupied, Macrophyllida was proposed in its place by Johnston (1929), who (Johnston, 1930a) redescribed and figured the species from specimens sent to him by Dr. C. [illegible]

Macrophyllida antarctica

Macrophyllida antarctica (Hughes, 1928) Johnston, 1929

(PLATE III, Figs. 11-15)

Synonym: Macrophylla antarctica Hughes, 1928

HOST: Mustelus antarcticus Gunther, Gummy Shark; family Galeorhinidae.

LOCALITY: Dunalley, Tasmania; 30 statute miles ENE of Hobart (15 fathoms, weed/mud).

PREVIOUSLY REPORTED HOST AND LOCALITY: Mustelus antarcticus Gunther; Port Phillip Bay, Victoria, Australia.

GEAR USED: Danish seine.

LOCATION: Gills.

NUMBER STUDIED: 2.

NUMBER MEASURED: 1.

Homeotype: USNM Holm. Coll. No.

VIMS Coll. No. H-615-2.

REDESCRIPTION: Body elongate, flattened dorsoventrally, 5.51 long by 1.25 wide. Cuticle fairly thin and smooth. Anterior end broadly rounded, separated from rest of body by constrictions on each side at level of midpoint of pharynx, bearing a pair of extensive glandular areas almost meeting in front, extending backwards around pharynx to near its posterior margin, containing numerous ducts; greatest width of prohaptoral region 1.22. Posthaptor a subsessile, concavo-convex, nearly circular sucker, opening ventrally, 0.962 in diameter, divided by five weakly developed septa into one central and five peripheral loculi; margin of posthaptor a weak muscular rim, surrounded by a marginal membrane up to 0.111 wide; armed with three pairs of dissimilar anchors, the first pair located at junction of posterolateral septa with that surrounding central loculus, and the second and third pairs of anchors located in the large posterior loculus; and 16 marginal hooks. Anteriormost anchors very small, left

one 0.0095? long, with blunt external tips and bifid internal tips; second pair of anchors elongate, slender, left one 0.0020 long and right one 0.0794 long, with slightly recurved blunt tips; third pair of anchors elongate, wider than second pair, right one 0.0618 long, with recurved sharp tips. (Large coil between second and third anchors on posthaptor.) Posthaptoral hooks 0.0103 long, each with a domus.

Pharynx muscular, 0.329 long by 0.403 wide, with a partially constricted margin and containing long, slender cells internally. Mouth subterminal, ventral, immediately anterior to pharynx. Esophagus short; gut bifurcated, crura with lateral but no medial dendritic branching, not confluent posteriorly. Two testes, oval, entire, obliquely tandem, left one smaller, 0.210 long by 0.214 wide, diagonally anterior to right one, 0.210 long by 0.223 wide, pre-equatorial in position. Vasa efferentia emerging from anteromedial margin of right testis and posterior margin of left testis fusing to right of left testis at its posteromedial margin, to form vas deferens. Vas deferens running to left of ovary, dorsal to vagina, dorsal to distal end of oötype, then turning right to pass dorsally and then ventrally to cirrus (entrance of vas deferens on cirrus not observed). Cirrus somewhat obliquely situated between right crus of intestine and oötype. Cirrus complex consisting of a sclerotized cirrus, and a prostate reservoir at the proximal end of cirrus, in cirrus pouch. Four large prostatic cells outside cirrus pouch, connected by small ducts to prostate reservoir. Uterus connecting to

cirrus pouch very near to left margin forming a genital atrium opening outside via the common marginal genital pore on left at level of posterior margin of pharynx. Glands of Goto, oval, large, containing cellular material, immediately to left and posterior of right testis and partially dorsal to those parts of right testis.

Ovary protesticular, entire, nearly circular except for anterior extension, 0.309 long by 0.287 wide, having internal chamber (=seminal receptacle of Maservo, 1938) containing mature ova; convoluted oviduct passing from internal chamber to proximal end of oötype. Oötype obliquely situated between cirrus and vagina, surrounded by Mehlis' gland cells; uterus thick-walled, tapering distally, opening into genital atrium. Vagina long, slender, looped immediately anterolateral to ovary, containing small duct with constriction at level of distal end of oötype, opening separate from, but close to, genital pore into a common ventral marginal depression having a muscular vaginal lip.

Vitellaria follicular, extending from near posterior level of pharynx to almost end of body proper, being smaller in intercecal field than in extracecal field. Vitelline reservoir(s) not observed. Egg not observed.

"Brain" anterior to pharynx. Four granular eyespots located dorsal to brain, the first pair smaller and closer together than the posterior pair. Excretory pores opening dorsolaterally near margin at posterior level of pharynx.

DISCUSSION: The present study reveals that the worms in this collection are probably conspecific with Macrophyllida antarctica (Hughes, 1928) Johnston, 1929.

Though smaller than those in the original description (Table 3), the worm used for the redescription measurements is considered mature due to the presence of mature ova in the ovary. The worms in the present collection differ from Hughes' (1928) description in the following: (1) presence of large Glands of Goto; (2) possession of a small anterior pair of anchors on the postheptor; (3) vas efferens from left testis coming from the posterior margin instead of the anterior margin; and, (4) the presence of 14 marginal hooks, each having a dentus (Llewellyn, 1963). Hughes (1928) also illustrated Laurer's canals near the posterior end of the body proper in her figure. These, in reality, are lateral branches of the gut and not Laurer's canals, which are found in digenetic trematodes. Johnston (1930a) mentioned the obvious mistake by Hughes (1928), who called the uterus the vagina and vice versa. In his redescription, Johnston (1930a) also failed to mention the following: (1) the Glands of Goto; (2) the occurrence of a small anterior pair of anchors on the postheptor; and, (3) the presence of 14 marginal hooks, each with a dentus. Both Hughes (1928) and Johnston (1930a) mentioned that the vas efferens emerges from the anterior margin of the left testis. In our specimens it comes from the posterior margin. The connection of the vas efferens to the left testis in this fashion can best be explained by a rotation of this testis

100 degrees to the right, which results in the tandem arrangement of the testes. This is further evidenced by the left gland of Goto moving forward to lie next to the right testis and posterior to the left testis.

The nature of the genital openings as described by Johnston (1930a) and Yamaguti (1936) is not clear. According to Johnston (1930a) there are three sex apertures. Yamaguti (1963) wrote that "cirrus, uterus and vagina opening close together into muscular common genital atrium which in turn opens on the left margin." In the two worms of the present collection the genital atrium is formed by the junction of the cirrus pouch and the uterus close to the left margin. The vagina opens close to, but posterior to, the genital pore in the depression. In other words, both sex apertures open separately, the common genital pore being directed somewhat posteriorly and the vaginal pore directed anteriorly. A single vaginal lip (Johnston, 1930a stated that two such lips occurred in his sample) is situated on the anterolateral edge of this depression.

The presence of the large cell between the posterior two pairs of anchors as mentioned by Johnston (1930a) is verified in this study. Johnston (1930a) stated that this cell was probably a multipolar nerve cell. Its actual function is unknown. The long gland cells of the pharynx, mentioned by Johnston (1930a) as resembling those described by Heath (1902) as occurring in Entobdella soummis (Heath, 1902) Johnston,

1929, were also observed. They have a large nucleus and protoplasm which is granular and stains well.

Sproston (1946) mentioned "the two posterior radii of typical Capsalids being virtually suppressed" in referring to those radii on which the posterior two pairs of anchors are located. Johnston (1930a) wrote that the disc of M. antarctica (Hughes, 1928) Johnston, 1929, has five peripheral depressions and that the "posterior depression is large and is bisected by two atrophied rays deprived of special musculature." Dychowsky (1957) considered these rays to represent the disappearing posterior septa of the rest of Monaloocotyle which is substantiated by the presence of middle anchors in them. The writer accepts Dychowsky's theory.

A total of two parasites were recovered from 17 host specimens (Table 8). The only known species of Merocotylidae, M. antarctica (Hughes, 1928) Johnston, 1929, occurs on Dissostichus antarcticus of the family Caloorhinidae.

Subfamily Benedeniinae Johnston, 1931

Synonym: Entobdellinae Dychowsky, 1957

DISCUSSION: Benedeniinae was defined as a subfamily in Capsalidae Baird, 1853 by Johnston (1931), who included the genera Entobdella Blainville in Lamarck, 1818, Benedenia Diesing, 1858, Pseudobenedenia Johnston, 1931, and several subgenera. Johnston (1929) had previously given an analysis of the benedeniid genera and their taxonomy, although the subfamily

TABLE 3.

Comparison of measurements of Haemonchillide anterotica

(Hughes, 1928) Johnston, 1929

		Hughes (1928)	Johnston (1930a)	Present sample
Ratico body	(l)	13.15	14.8	5.51
	(w)	1.3-2.5	2.8	1.25
Posthaptor		------	2.0	0.062 (dia)
Marginal membrane	(w)	------	------	0.111
Anchor 1	(l)	------	------	L 0.00059
Anchor 2	(l)	------	0.095	L 0.0820 R 0.0794
Anchor 3	(l)	------	------	R 0.0010
Hooks	(l)	------	------	0.0108
Prohaptoral region	(w)	------	------	1.22
Pharynx	(l)	------	0.7	0.329
	(w)	------	0.05	0.403
Testes L	(l)	------	0.6	0.210
	(w)	------	0.36	0.214
R	(l)	------	0.6	0.210
	(w)	------	0.45	0.223
Ovary	(l)	------	0.6 (dia)	0.209
	(w)	------	------	0.207
Egg	(l)	0.220	------	------
	(w)	0.107	------	------

(l) = length
(w) = width

L = left
R = right

(dia) = diameter

was not then defined. Earlier, Monticelli (1902) had placed Entobdella Blainville in Lamarck, 1818, and Ancyrocotyle Parona and Monticelli, 1903, under a new subfamily Ancyrocotylinae. Johnston (1931) wrote that "the subfamily, Ancyrocotylinae, should be restricted to contain forms like Ancyrocotyle." Price (1934b), however, placed Ancyrocotyle in the subfamily Benedeniinae, and Meserve (1938) retained Ancyrocotyle in the subfamily and ignored the subgenera of Johnston (1931). Price (1939a) gave a redefinition of Benedeniinae and included Encotyllabe Diesing, 1850, and Ancyrocotyle Parona and Monticelli, 1903.

Bychowsky (1957) proposed the following: (1) Benedeniinae Johnston, 1931 (part) in the subfamily Trochopodinae (Price, 1936) Sproston, 1946, including the genera Trochopus Diesing, 1850, Benedenia Diesing, 1858, and Pseudobenedenia Johnston, 1931; (2) Benedeniinae Johnston, 1931 (part) in the new subfamily Entobdellinae Bychowsky, 1957, including the genus Entobdella Blainville in Lamarck, 1818; (3) genus Encotyllabe Diesing, 1850 in the subfamily Encotyllabinae Monticelli, 1892; and, (4) Ancyrocotyle Parona and Monticelli, 1903 in the subfamily Mitzschiinae Johnston, 1931.

In his rearrangement, Yamaguti (1963) included Entobdellinae Bychowsky, 1957 as a synonym of Benedeniinae Johnston, 1931, and included the genera Benedenia Diesing, 1858, Ancyrocotyle Parona and Monticelli, 1903, Entobdella Blainville in Lamarck, 1818, Pseudobenedenia Johnston, 1931,

and Metabenedeniella Yamaguti, 1958. He further raised the Metabenedeniella subgenus Benedeniella Johnston, 1931 to generic rank, and added the new genera Neobenedenia, Allobenedenia, Neobenedeniella, and Pseudocentrocotyla.

In the beginning the author was somewhat skeptical of Yamaguti's (1963) rearrangement of the subfamily Benedeniinae Johnston, 1931. However, upon considering those characters which may be of taxonomic significance (Table 4) it has been concluded that such an arrangement is justifiable. The shape and arrangement of the prohaptoral region, the status of the gut, the shape and size of the cirrus, the presence or absence of a vagina, and the presence of the prostate reservoir inside or outside of the cirrus pouch are all regarded as taxonomically significant characters.

The detailed shape of the pharynx is a questionable character taxonomically because it may vary within a species due to: (1) the physiological state of the worm at the time of killing; (2) the state of relaxation that the parasite exhibits (contracted or expanded); and, (3) the method of mounting, e.g., pressure-fixation and pressure-mounting may distort the pharynx. It is further noted that both the type genus, Benedenia Diesing, 1858, and Neobenedenia Yamaguti, 1963, as they are now understood, contain members in which the pharynx is lobulate or globular (Table 4).

Certain problems exist with the long-curved versus the short-straight cirrus as a criterion. For example, the genus Pseudobenedenia Johnston, 1931, which has only two species, contains one (P. notothenicae Johnston, 1931) that has a short-straight cirrus and one (P. noblei (Menzies, 1946) Yamaguti, 1963) that has a long-curved cirrus. Since the size and shape of the cirrus were used in Table 4 in order to examine Yamaguti's (1963) taxonomic rearrangement of the genus, it appears likely that some change should be made in order to follow the same scheme of separating the genera. It should be further noted that Pseudobenedenia noblei (Menzies, 1946) Yamaguti, 1963 has a different arrangement of the proheptoral region than Pseudobenedenia notothenicae Johnston, 1931, a distinct preoral lobe being lacking in P. noblei.

The author accepts Yamaguti's (1963) rearrangement of the subfamily Benedeniinae Johnston, 1931 and provisionally accepts his addition of Pseudobenedenia noblei (Menzies, 1946) Yamaguti, 1963 to the genus Pseudobenedenia Johnston, 1931, on the reasoning that without careful examination of the species of this genus a change is not justifiable at this time.

Genus Neobenedenia Yamaguti, 1963

DISCUSSION: Johnston (1929) grouped the species of Benedenia Diesing, 1858 into three subgenera: Benedenia, Benedeniella, and Parabenedenia. In Parabenedenia he included Neobenedenia melleni (MacCallum, 1927) Yamaguti, 1963 (=Benedenia (Parabenedenia) melleni). Price (1939a) stated that in addition

TABLE 4.

Comparison of the major taxonomic characters separating the genera of the subfamily Benedeniinae

	Prohaptor type	Gut	Pharynx	Cirrus	Vagina	Position of the prostate reservoir
Benedenia (TYPE GENUS)	cup-like, not on a lobe	branched, not joined	lobulate or globular	short-straight	present	outside cirrus pouch
Allobenedenia	membr. hood	"	globular	long-curved	"	"
Pseudobenedenia	"	"	lobulate	short-straight & long curved	"	inside cirrus pouch
Neobenedenia	cup-like, not on a lobe	"	lobulate or globular	short-straight	absent	"
Benedeniella	cup-like, not on a lobe; anterior part glandular	"	lobulate	long-curved	present	"

Table 4 continued

	Prohaptor type	Gut	Pharynx	Cirrus	Vagina	Position of the prostate reservoir
Neobenedenidella	cup-like, not on a lobe	"	lobulate	short-straight	"	"
Metabenedenidella	"	"	lobulate	long-curved	"	"
Entobdella	glandular areas	branched, joined	globular	short-straight	"	"
Paraxenentobdella	glandular areas	branched, not joined	globular	short-straight	"	outside cirrus pouch
Anoxyacetyle	cup-like, on a lobe	not branched, not joined	globular	short-straight	"	inside ? cirrus

to the absence of vaginae, the haptoral hooks of four species (_nolleni_, _adamsa_, _koaballae_, _mulleri_) are so similar that these two characters considered together might be adequate for the erection of a separate genus. Margis (1955), in his discussion of _Neobenedenia girellae_ (Margis, 1955) Yamaguti, 1963, agreed that some taxonomic separation of those evaginate species from the other species of the genus _Benedenia_ Diesing, 1858 was justifiable. Margis (1955) also stated that if a subgenus were named after them, then Johnston's (1929) subgenera should be considered and interpreted. Yamaguti (1963) proposed a new genus, _Neobenedenia_, for the five species of evaginate benedeniids, with _Neobenedenia nolleni_ (MacCallum, 1927) Yamaguti, 1963 as the type species.

Neobenedenia nilsoni n. sp.

(PLATE IV, Figs. 16-20)

HOST: _Rhyncobatus armatus_ (Bloch and Schneider); family Rhynchobatidae.

LOCALITY: Carnarvon, Western Australia; 6 statute miles NE of Cape Boreas (9 fathoms, sand/shell).

GEAR USED: Trawl.

LOCATION: Gills.

NUMBER STUDIED: 5.

NUMBER MEASURED: 4.

Holotype: USNM Helm. Coll. No.
VIMS Coll. No. V-683-4.

Paratype: USNM Helm. Coll. No.
VIMS Coll. No. V-683-1.

DESCRIPTION: Body elliptical, flattened dorsoventrally, somewhat rounded anteriorly and posteriorly, (4) 1.61 (1.40 - 1.96) long by (4) 0.521 (0.420 - 0.698) wide. Cuticle fairly thin and smooth. Prohaptor a pair of ventrolateral suckers; left sucker (4) 0.149 (0.132 - 0.154) long by (4) 0.142 (0.133 - 0.162) wide, and right sucker (3) 0.145 (0.131 - 0.156) long by (3) 0.147 (0.136 - 0.160) wide. Posthaptor a subsessile, acetate, concavo-convex, circular sucker, opening ventrally, (3) 0.329 (0.297 - 0.380) long by (4) 0.332 (0.303 - 0.390) wide; margin of posthaptor surrounded by a marginal membrane (4) 0.0234 (0.0204 - 0.0251) wide; armed with three pairs of dissimilar anchors and 14 marginal hooks. Anteriormost anchors stout, left one (3) 0.0500 (0.0518 - 0.0590) long and right one (3) 0.0532 (0.0486 - 0.0569) long, with small pointed knobs on external tips and blunt internal tips; second pair of anchors elongate, robust, left one (2) 0.0761 (0.0649 - 0.0873) long and right one (3) 0.0767 (0.0659 - 0.0867) long, with thick recurved sharp tips; third pair of anchors elongate, left one (2) 0.0455 (0.0408 - 0.0569) long and right one (3) 0.0496 (0.0396 - 0.0592) long, with thin recurved sharp tips. Posthaptoral hooks (4) 0.00740 (0.00653 - 0.00816) long.

Pharynx muscular, (4) 0.179 (0.161 - 0.236) long by (4) 0.152 (0.129 - 0.192) wide, with more or less indented outline. Mouth subterminal, immediately anteroventral to pharynx. Esophagus short; gut bifurcated, crura with lateral and medial dendritic branching, not confluent posteriorly.

Two small testes, side by side but not touching, entire, oval in outline, left one (4) 0.0729 (0.0700 - 0.0795) long by (4) 0.0660 (0.0551 - 0.0745) wide and right one (4) 0.0740 (0.0712 - 0.0775) long by (4) 0.0638 (0.0575 - 0.0765) wide, equatorial in position. Vasa efferentia and vas deferens not observed. Cirrus obliquely situated immediately posterior to pharynx, contained in cirrus pouch. Prostate reservoir apparently enclosed in cirrus pouch. Uterus connecting to cirrus pouch at level of posterior margin of pharynx to form genital atrium opening outside via the common submarginal genital pore on left at level of anterior end of pharynx. Glands of Lang almost as large as testes, on each side of the midline posterior to testes.

Ovary immediately pretesticular, nearly circular, entire, median, (4) 0.121 (0.107 - 0.153) long by (4) 0.117 (0.106 - 0.147) wide, having internal chamber (seminal receptacle of Reisner, 1930) containing mature ova; oviduct convoluted, passing from internal chamber dorsal to vitelline reservoir, entering dorsally on oötype. Oötype large, obliquely situated, surrounded by Mehlis' gland cells at its proximal end; uterus short, opening into genital atrium. Vagina absent.

Vitellaria follicular, extending from anterior level of pharynx to very close to the end of body proper. Transverse vitelloducts fusing medially to form large vitelline reservoir immediately anterior to ovary. Eggs not observed.

"Brain" anterodorsal to anterior part of pharynx. Four granular eyespots located dorsal to brain, the first pair smaller and closer together than the posterior pair. Excretory pores on same level as oötype, opening dorsolaterally.

DISCUSSION: The present species is apparently closely related to Neobenedenia mulleri (Meserve, 1938) Yamaguti, 1963 from the gills of Cratinus agassizii Steindachner in that it has: (1) testes entire, equatorial; (2) glands of Goto; (3) nearly circular prehaptoral suckers; and, (4) a somewhat globular pharynx. However, it differs from N. mulleri (Meserve, 1938) Yamaguti, 1963 in the following respects (Table 5): (1) smaller body size; (2) smaller anchors; (3) smaller testes which are more widely separated; and, (4) host.

This description increases the number of species in the genus Neobenedenia Yamaguti, 1963 to six. These are: N. melleni (MacCallum, 1927) Yamaguti, 1963 (type species); N. adenen (Meserve, 1938) Yamaguti, 1963; N. girellae (Hargis, 1955) Yamaguti, 1963; N. kuhliae (Meserve, 1938) Yamaguti, 1963; N. mulleri (Meserve, 1938) Yamaguti, 1963; and N. wilsoni n. sp.

N. wilsoni n. sp. is named after Mr. William Stanley Wilson of the Virginia Institute of Marine Science, who made the collections from Australia.

A total of five parasites were found on 12 host specimens (Table 3).

TABLE 5.

Comparison of measurements of *Neobenedenia mellori* (Meserve, 1938) Yamaguti, 1963 and *Neobenedenia villani* n. sp.

		N. mellori Meserve (1938)	*N. villani* n.sp.
Entire body	(l.)	4.116	1.40-1.96
	(w.)	1.603	0.629-0.698
Posthaptor		1.089 (dia)	(l.)0.297-0.380 (w.)0.303-0.390
Marginal membrane	(w.)	-----	0.0206-0.0251
Anchor 1	(l.)	0.176	L 0.0518-0.0590 R 0.0406-0.0560
Anchor 2	(l.)	0.50	L 0.0649-0.0873 R 0.0659-0.0867
Anchor 3	(l.)	0.109	L 0.0603-0.0509 R 0.0396-0.0592
Hooks	(l.)	0.020	0.00659-0.00816
Prehaptoral nucleus		(l.)0.508 (w.)0.440	L(l.) 0.132-0.154 (w.) 0.133-0.162 R(l.) 0.131-0.156 (w.) 0.136-0.163
Pharynx		-----	(l.) 0.141-0.236 (w.) 0.120-0.192
Testes		(l.)0.339 (w.)0.235	L(l.) 0.0700-0.0796 (w.) 0.0551-0.0745 R(l.) 0.0712-0.0775 (w.) 0.0575-0.0765
Ovary	(l.)	0.305	0.107-0.153
	(w.)	0.339	0.106-0.167

(l.) = length
(w.) = width
L = left
R = right
(dia) = diameter

Genus Benedeniella (Johnston, 1929) Yamaguti, 1963

DISCUSSION: Johnston (1929) proposed a new subgenus Benedeniella with Benedenia (Benedeniella) macrocolna (Lühe, 1906) as the type species. Spencton (1940) included Benedeniella as a subgenus along with the other subgenera of Johnston (1929) in her key to the genera and subgenera of Benedeniinae Johnston, 1931. Yamaguti (1963) raised Benedeniella from subgeneric rank to generic rank, with B. macrocolna (Lühe, 1906) Johnston, 1929 as the type species.

Benedeniella cystovarina n. sp.

(PLATE V, Figs. 21-27)

HOST: Lethrinus chrysostomus Richardson; Sweet-lip Emperor; family Lethrinidae.

LOCALITY: Gladstone, Queensland; 36 statute miles NNE of Gladstone (9 fathoms, coral).

GILL USED: Hand 1ino.

LOCATION: Gills.

NUMBER STUDIED: 4.

NUMBER INFECTED: 3.

Holotype: USNM Helm. Coll. No.

USNM Coll. No. V-526-1.

Paratypes: USNM Helm. Coll. Nos.

USNM Coll. Nos. V-546-2, V-546-4.

DESCRIPTION: Body elliptical, flattened dorsoventrally, somewhat rounded anteriorly and posteriorly, (3) 1.76 (1.29 - 2.46) long by (3) 0.759 (0.454 - 1.10) wide. Cuticle fairly

thin and smooth. Prehaptor a pair of anterolateral suckers, having a glandular area anteriorly and a small sucker posteriorly, left prehaptor (3) 0.133 (0.0987 - 0.163) long by (3) 0.196 (0.150 - 0.252) wide and right prehaptor (3) 0.129 (0.102 - 0.176) long by (3) 0.196 (0.161 - 0.256) wide. Posthaptor a subcentral, acetabular, concave-convex sucker, opening ventrally, (3) 0.391 (0.254 - 0.506) long by (3) 0.402 (0.279 - 0.590) wide; margin of posthaptor surrounded by a marginal membrane (3) 0.0297 (0.0214 - 0.0403) wide; armed with three pairs of dissimilar anchors and 14 marginal hooks. Anteriormost anchors stout, left one (2) 0.0514 (0.0502 - 0.0526) long and right one (2) 0.0630 (0.0557 - 0.0704) long, with rounded, slightly pointed external tips and blunt internal tips; second pair of anchors elongate, left one (2) 0.0392 (0.0361 - 0.0422) long and right one (2) 0.0395 (0.0361 - 0.0428) long, with thick recurved sharp tips; third pair of anchors elongate, left one (3) 0.0350 (0.0314 - 0.0393) long and right one (2) 0.0321 (0.0310 - 0.0334) long, with thin recurved sharp tips. Posthaptoral hooks (3) 0.00616 (0.00612 - 0.00918) long.

Pharynx muscular, (3) 0.161 (0.114 - 0.247) long by (3) 0.181 (0.130 - 0.264) wide, with more or less indented outline. Mouth subterminal, ventral to pharynx. Esophagus short; gut bifurcated, crura with lateral and medial dendritic branching, not confluent posteriorly.

Two testes, juxtaposed, concentrated, entire, oval in outline, left one (3) 0.199 (0.165 - 0.247) long by (3) 0.169 (0.127 - 0.239) wide and right one (3) 0.195 (0.173 - 0.232) long by (3) 0.166 (0.131 - 0.200) wide, equatorial in position. Vasa efferentia and vas deferens not observed posterior to bulbous swelling of vas deferens just posterior to ovary. Vas deferens passing ventral to left margin of ovary, dorsal to left arm of vitelline reservoir, proximal end of vagina, distal end of oötype, and cirrus, forming a dilation dorsal to cirrus. Cirrus long, sclerotized, with base on right side of median line, contained in cirrus pouch. Prostate reservoir apparently enclosed in cirrus pouch. Uterus connecting to cirrus pouch at level of posterior margin of pharynx to form genital atrium opening outside via the common marginal genital pore on genital pad on left just posterior to left prehepatic. Glands of Goto small, oval, on each side of midline posterior to testes.

Ovary pretesticular, nearly circular, entire, median, (3) 0.118 (0.0887 - 0.173) long by (3) 0.123 (0.0889 - 0.163) wide, having internal chamber (=seminal receptacle of Meserve, 1938) containing mature ova; oviduct passing from internal chamber dorsal to right arm of vitelline reservoir, entering proximal end of oötype. Oötype obliquely situated between cirrus and vagina, surrounded by Mehlis' gland cells; uterus short, opening into genital atrium. Vagina long, with bulbous swelling at proximal end, passing forward to left and turning slightly posteriorly to open on left margin posterior to genital pore.

Vitellaria folliculer, extending from anterior end of pharynx to near posterior end of body proper. Transverse vitelloducts fusing medially to form vitelline reservoir immediately anterolateral and partly ventral to ovary. Egg in utero polyhedral, (2) 0.121 (0.120 - 0.122) long by (2) 0.109 (0.102 - 0.113) wide.

"Brain" anterodorsal to pharynx. Four granular eyespots located dorsal to brain, the first pair smaller and closer together than the posterior pair. Excretory pore on same level as uterus, opening dorsolaterally.

DISCUSSION: The present species is apparently related to Lonchoptilla macrocolpa (Lühe, 1906) Johnston, 1929 in that it has: (1) prohaptoral area with the anterior part glandular and the posterior part bearing suckers; (2) a vitelline reservoir that is transversely elongated; (3) a vaginal duct that is long and opens on the margin; (4) a long, thin cirrus; and, (5) the vitelline reservoir enclosed in the cirrus pouch. However, it differs from L. macrocolpa (Lühe, 1906) Johnston, 1929 in the following respects (Table 6): (1) much smaller body size; (2) much smaller suckers; (3) vagina, without posterior loop, opening on margin at greater distance from genital pore; (4) vas deferens passing forward to uterus and turning posteriorly to enter dorsal to cirrus pouch; and, (5) host class.

This description increases the number of species in the genus Lonchoptilla (Johnston, 1929) to three. These are:

TABLE 6.

Comparison of measurements of *Benedeniella* species

		B. macrocolpa Lühe (1906)	*B. posterocolpa* Harris (1955)	*B. cystovagina* n. sp.
Entire body	(l)	9.0-10.0	7.4-13.9	1.29-2.46
	(w)	5.0-7.0	6.4-8.7	0.454-1.18
Post-haptor	(l)	2.3-2.6	1.9-3.2	0.254-0.506
	(w)	2.1-2.4	2.0-2.7	0.279-0.596
Marginal membrane	(w)	-------	-------	0.0214-0.0463
Anchor 1	(l)	-------	0.471-0.701	L 0.0502-0.0526 R 0.0557-0.0704
Anchor 2	(l)	-------	0.675-1.070	L 0.0361-0.0422 R 0.0361-0.0428
Anchor 3	(l)	-------	0.057-0.089	L 0.0314-0.0392 R 0.0318-0.0324
Hooks	(l)	-------	0.011-0.016	0.00612-0.00918
Pro-haptoral suckers		1.0 (dia)	1.3-1.8 (dia)	L(l)0.0987-0.183 (w)0.158-0.252 R(l)0.102-0.176 (w)0.161-0.256
Pharynx		-------	(l)0.552-1.334 (w)0.446-0.764	(l)0.114-0.247 (w)0.130-0.264
Testes		-------	0.783-1.229 (dia)	L(l)0.165-0.247 (w)0.127-0.239 R(l)0.173-0.232 (w)0.131-0.230
Ovary		-------	-------	(l)0.0807-0.173 (w)0.0889-0.168
Egg		-------	(l)0.166-0.185 (w)0.166-0.185	(l)0.120-0.122 (w)0.102-0.113

(l) = length
(w) = width
L = left
R = right
(dia) = diameter

B. macrocolpa (Lühe, 1906) Johnston, 1929 from Rhinoptera javanica (Ceylon); B. postorecolpa (Margolis, 1955) Yamaguti, 1963 from Rhinoptera quadriloba (Florida); and B. cyatovagina n. sp. from Lethrinus chrysostomus (Australia). This non-rigid host-specificity (Margolis, 1957) of Benedeniella (Johnston, 1929) Yamaguti, 1963 could possibly represent paleoecological or neo-ecological relationships between the hosts.

A total of four parasites were recovered from 28 host individuals (Table 8).

Genus Benedenia Diesing, 1850

Synonyms: Epibdella Beneden, 1856, part
Khylline Oken, 1815, not Abildgaard, 1790, part
Trigtoma Cuvier, 1817, part

DISCUSSION: Since Sproston's (1946) excellent account of the genus Benedenia Diesing, 1850, the species B. jaliscana Bravo-Hollis, 1951 from Epinephelus labriformis and B. synarris Yamaguti, 1953 from Synarris sp. have been added to the genus.

Benedenia anteropulvi n. sp.

(PLATE VI, Figs. 20-24)

HOSTS: (1) Lethrinus chrysostomus Richardson, Sweet-lip Emperor; family Lethrinidae, and (2) Lutjanus sebae (Cuvier), Red Emperor; family Lutianidae.

LOCALITIES: (1) Cladstone, Queensland; 27 statute miles NE of Cladstone (9-12 fathoms, coral/weed) and Cladstone,

Queensland; 36 statute miles ENE of Gladstone (9 fathoms, coral). (2) Gladstone, Queensland; 27 statute miles NE of Gladstone (9-12 fathoms, coral/weed).

GEAR USED: Hand line.

LOCATION: Gills.

NUMBER STUDIED AND MEASURED: 6.

Holotype: USNM Helm. Coll. No.

VIMS Coll. No. V-509-1

Paratype: USNM Helm. Coll. No.

VIMS Coll. No. V-517-1.

DESCRIPTION: Body elliptical, flattened dorsoventrally, (4) 2.54 (1.79 - 3.49) long by (4) 0.774 (0.592 - 0.983) wide. Cuticle fairly thin and smooth. Prohaptor a pair of ventrolateral suckers; left sucker (4) 0.183 (0.155 - 0.223) long by (4) 0.213 (0.188 - 0.252) wide and right sucker (3) 0.170 (0.144 - 0.211) long by (3) 0.229 (0.201 - 0.255) wide. Prehaptoral region containing glandular areas. Posthaptor a subsessile, acetabo, concave-convex, circular sucker, opening ventrally, (4) 0.463 (0.379 - 0.572) long by (3) 0.462 (0.407 - 0.546) wide; surrounded by a marginal membrane (3) 0.0313 (0.0269 - 0.0359) wide; armed with three pairs of dissimilar anchors and 14 marginal hooks. Anteriormost anchors robust, left one (3) 0.121 (0.0989 - 0.137) long and right one (3) 0.118 (0.0798 - 0.139) long, with slightly curved pointed external tips and broad bifid internal tips; second pair of anchors elongate, robust, left one (2) 0.101 (0.0755 - 0.126) long and right one (3) 0.109 (0.0939 - 0.127) long, with thick recurved sharp tips; third pair of

anchors elongate, left one (2) 0.0901 (0.0875 - 0.0926) long and right one (3) 0.0811 (0.0530 - 0.102) long, with thin recurved sharp tips. Posthaptoral hooks (2) 0.00736 (0.00673 - 0.00796) long.

Pharynx muscular, lobulate, (4) 0.178 (0.126 - 0.268) long by (4) 0.208 (0.137 - 0.309) wide. Mouth subterminal, anteroventral to pharynx. Esophagus short; gut bifurcated, ceura with lateral and medial dendritic branching, not confluent posteriorly.

Two testes, juxtaposed, entire, oval in outline, left one (4) 0.201 (0.165 - 0.272) long by (4) 0.173 (0.135 - 0.233) wide and right one (4) 0.206 (0.163 - 0.294) long by (4) 0.185 (0.161 - 0.234) wide, pre-equatorial in position. Posterior end of vas deferens, including the vasa efferentia, not observed posterior to bulbous swelling of vas deferens immediately behind ovary. Vas deferens winding forward on left, forming three large dilations: (1) dorsal to proximal end of uterus; (2) to right of cirrus; and, (3) dorsal to proximal end of cirrus pouch. Third dilation opening into large seminal vesicle, which in turn continues forward and joins ejaculatory duct at proximal end of cirrus. Cirrus obliquely situated posterior to pharynx, contained in cirrus pouch. Prostate reservoir outside cirrus pouch, connected by small duct passing ventral to cirrus pouch and to ejaculatory duct of cirrus. Prostatic cells to left, anterior, and posterior to prostate reservoir. Uterus connecting to cirrus pouch at level of posterior margin of

pharynx to form genital atrium opening outside via the common submarginal genital pore on left just posterior to left anterior ocelli. Muscular and sclerotized genital pad, which is connected by muscular fibers to two cuticularized cocotte-shaped structures on dorsal side of left prohepton, present around genital pore.

Ovary protostigular, nearly circular, entire, median, (4) 0.159 (0.109 - 0.224) long by (4) 0.157 (0.107 - 0.220) wide, having internal chamber (seminal receptacle of Reisero, 1980) containing mature ova; oviduct passing from internal chamber dorsal to vitelline reservoir, entering dorsally on oötype. Oötype large, obliquely situated between cirrus and vagina, surrounded by 'shell' gland cells; uterus short, opening into genital atrium. Vagina long, with bulbous swelling at proximal end, opening submarginally on left posterolateral to common genital pore.

Vitellaria folliculer, extending from level of brain to near posterior end of body proper. Transverse vitelloducts fusing medially to form vitelline reservoir immediately anterolateral to ovary. Sac in uterus with convoluted basal filament (1) 0.116 long by (1) 0.0069 wide.

"Brain" anterodorsal to pharynx, having three pairs of nerves passing forward to prehepteral region. Four granular eyespots located dorsal to brain, the first pair smaller and closer together than the posterior pair. Excretory pores at level of posterior margin of pharynx, opening dorsolaterally.

DISCUSSION: The present species is apparently related to Benedenia serialae (Yamaguti, 1934) Price, 1939 from Seriola aureovittata and S. quinqueradiata in that it has: (1) submarginal genital openings; (2) bulbous swelling of vas deferens posterior to ovary; (3) similarly shaped pharynx; (4) anteriormost pair of anchors with bifid internal tips. However, it differs from B. serialae (Yamaguti, 1934) Price, 1939 in the following respects (Table 7): (1) smaller body size; (2) vas deferens with three large dilations; (3) smaller anchors; (4) genital pad around common genital pore, pad connected to two rosette-shaped structures (function unknown) on the dorsal surface of the left perhaptor; (5) proximal end of vagina bulbous; and, (6) host.

This description increases the number of species in the genus Benedenia Diesing, 1858 to 14. A summary of the other 13 species is given by Yamaguti (1963).

A single specimen of B. anteroovulvi n. sp. was recovered from 15 specimens of Lutianus sebae and three parasites were found on 20 specimens of Lutianus chrysotaenia (Table 8).

TABLE 7.

Comparison of measurements of Benedenia scriolae (Yamaguti, 1934) Price, 1939 and Benedenia antorenulvi n. sp.

		B. scriolae Yamaguti (1934)	B. antorenulvi n. sp.	
Basire body	(l)	5.5-6.6		1.79-3.49
	(w)	3.1-3.9		0.592-0.883
Posthaptor	(l)	1.56-1.8		0.373-0.572
	(w)	1.4-1.63		0.407-0.566
Marginal membrane	(w)	----------		0.0269-0.0359
Anchor 1	(l)	0.36-0.48	L	0.0889-0.137
			R	0.0793-0.139
Anchor 2	(l)	0.47-0.55	L	0.0755-0.126
			R	0.0808-0.127
Anchor 3	(l)	0.08-0.1	L	0.0375-0.0826
			R	0.0530-0.102
Hooks	(l)	----------		0.00673-0.00706
Prehaptoral cuticora		(l)0.625-0.8 (w)0.45-0.62	L(l)0.155-0.223 (w)0.188-0.252 R(l)0.166-0.211 (w)0.201-0.255	
Rhoptries		----------	(l)0.126-0.260 (w)0.137-0.339	
Testes		(l)0.56-0.73 (w)0.5-0.71	L(l)0.163-0.272 (w)0.135-0.230 R(l)0.163-0.294 (w)0.161-0.224	
Ovary		(l)0.4-0.61 (w)0.55-0.72	(l)0.185-0.284 (w)0.137-0.220	
Egg		----------	(l)0.116 (w)0.0989	

(l) = length
(w) = width
L = left
R = right
(dia) = diameter

SUMMARY

Collections comprising 93 species of common marine fishes from Australian waters yielded ten species of capsalids (Monogenea:Capsalidae) and two species of monocotylids (Monogenea: Monocotylidae). Nearly all are new to science.

Six species of capsalids from five host species are discussed herein. Five, *Sprostonia longiphallus* n. sp., *Allosprostonia tauvinae* n. gen., n. sp., *Neobenedenia wilsoni* n. sp., *Benedeniella cyanoruscina* n. sp., and *Benedenia anterovulvi* n. sp., are described for the first time. One species, *Macrophyllida antarctica* (Hughes, 1928) Johnston, 1929, is redescribed.

Most of the species were satisfactorily placed in suitable existing genera; however, it has been necessary to erect a new genus for one, *Allosprostonia tauvinae* n. gen., n. sp. The subfamily Trochopodinae (Price, 1936) Sproston, 1946 is emended to accommodate this new genus, *Allosprostonia*. The genus *Sprostonia* Bychowsky, 1957 is emended to accommodate the new species *Sprostonia longiphallus* n. sp. and the genus *Macrophyllida* Johnston, 1929 is emended in order to correct Yamaguti's (1963) diagnosis of the genus.

In addition, a historical review and discussion of each taxonomic group is presented along with a discussion of those characters considered taxonomically significant. After a study of the diagnoses by Yamaguti (1963) of the subfamilies Trochopodinae (Price, 1936) Sproston, 1946 and Benedeniinae Johnston, 1931, the author accepts his rearrangements, with the emendations presented herein.

TABLE 8.

Occurrence of Capsalids reported in this paper on their hosts

Name	HOSTS No. Spec.	Field No.	Nearest Town	Sta.	PARASITES Trochopodinae	Benedeniinae				
					Sprostonia longiphallus	Allospros-tonia tauvinae	Macrophyll-ida antarctica	Neobenedenia wilsoni	Benedeniella cystovagina	Benedenia anteropulvi
Epinephelus tauvina	2	[illegible]-534	Gladstone	B	16	-----	-----	-----	-----	-----
	2	535	"	B	33	2	-----	-----	-----	-----
	1	536	"	B	9	-----	-----	-----	-----	-----
	2	543	"	B	26	-----	-----	-----	-----	-----
Mustelus antarcticus	6	615	Dunalley	E	-----	-----	2	-----	-----	-----
	11	663	Port Romney	U	-----	-----	-----	-----	-----	-----
Siganus oramin	12	603	Carnarvon	Z	-----	-----	-----	5	-----	-----
Lethrinus chrysostomus	6	503	Gladstone	A	-----	-----	-----	-----	-----	-----
	8	509	"	A	-----	-----	-----	-----	-----	1
	8	524	"	B	-----	-----	-----	-----	1	-----
	6	566	"	B	-----	-----	-----	-----	3	2
Lutjanus ochae	1	514	Gladstone	A	-----	-----	-----	-----	-----	-----
	1	516	"	A	-----	-----	-----	-----	-----	-----
	1	517	"	A	-----	-----	-----	-----	-----	1
	2	519	"	A	-----	-----	-----	-----	-----	-----
	3	520	"	A	-----	-----	-----	-----	-----	-----
	6	537	"	B	-----	-----	-----	-----	-----	-----
	1	540	"	B	-----	-----	-----	-----	-----	-----
					93	2	2	5	4	4

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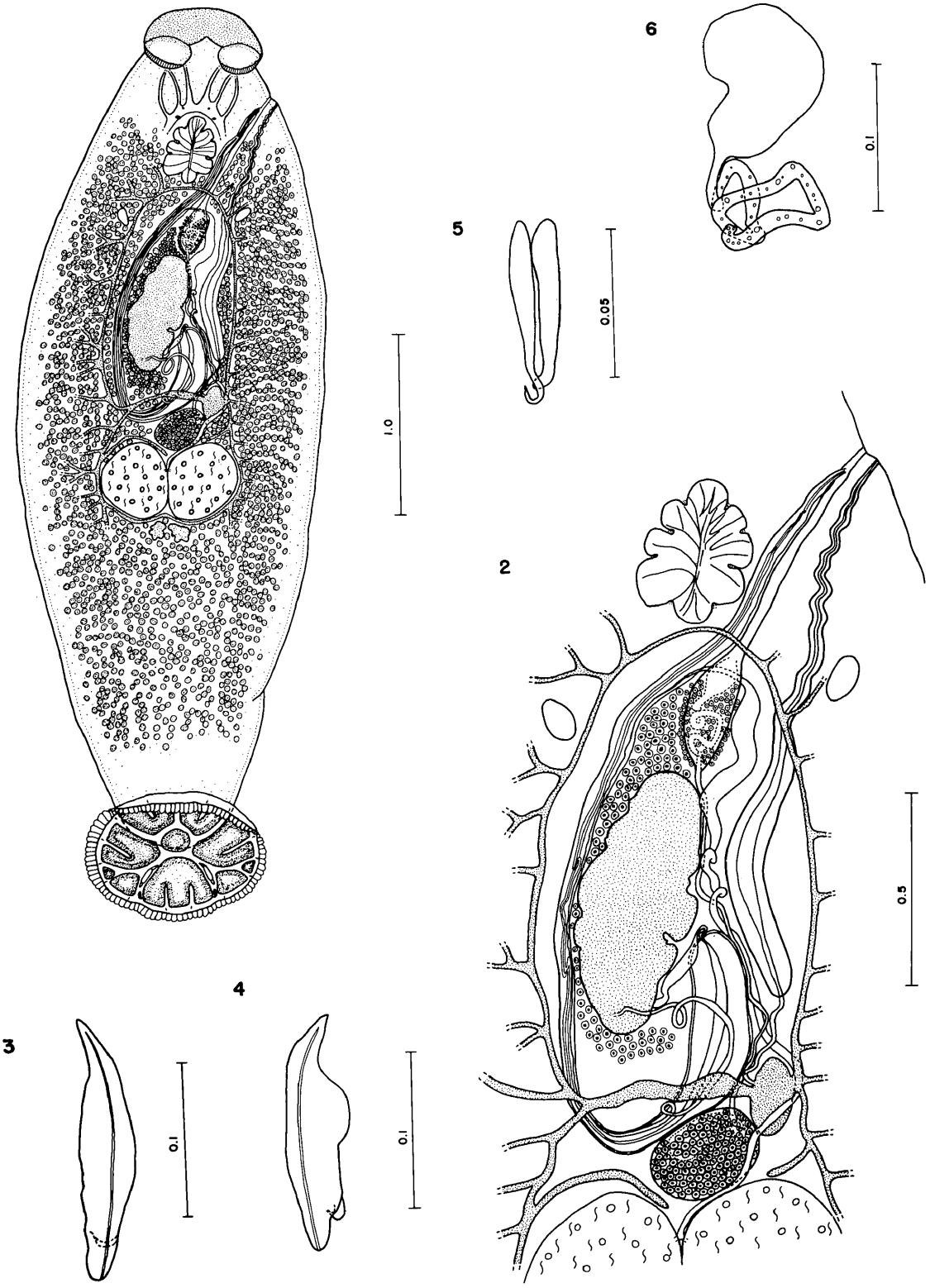
EXPLANATION OF PLATE I

Sprostonia longiphallus n. sp.

Figs.

1. Whole mount, ventral view.
2. Reproductive organs and terminal genitalia, ventral view.
3. Left anteriormost anchor.
4. Right anteriormost anchor.
5. Right middle and posteriormost anchors.
6. Egg *in utero*, ventral view.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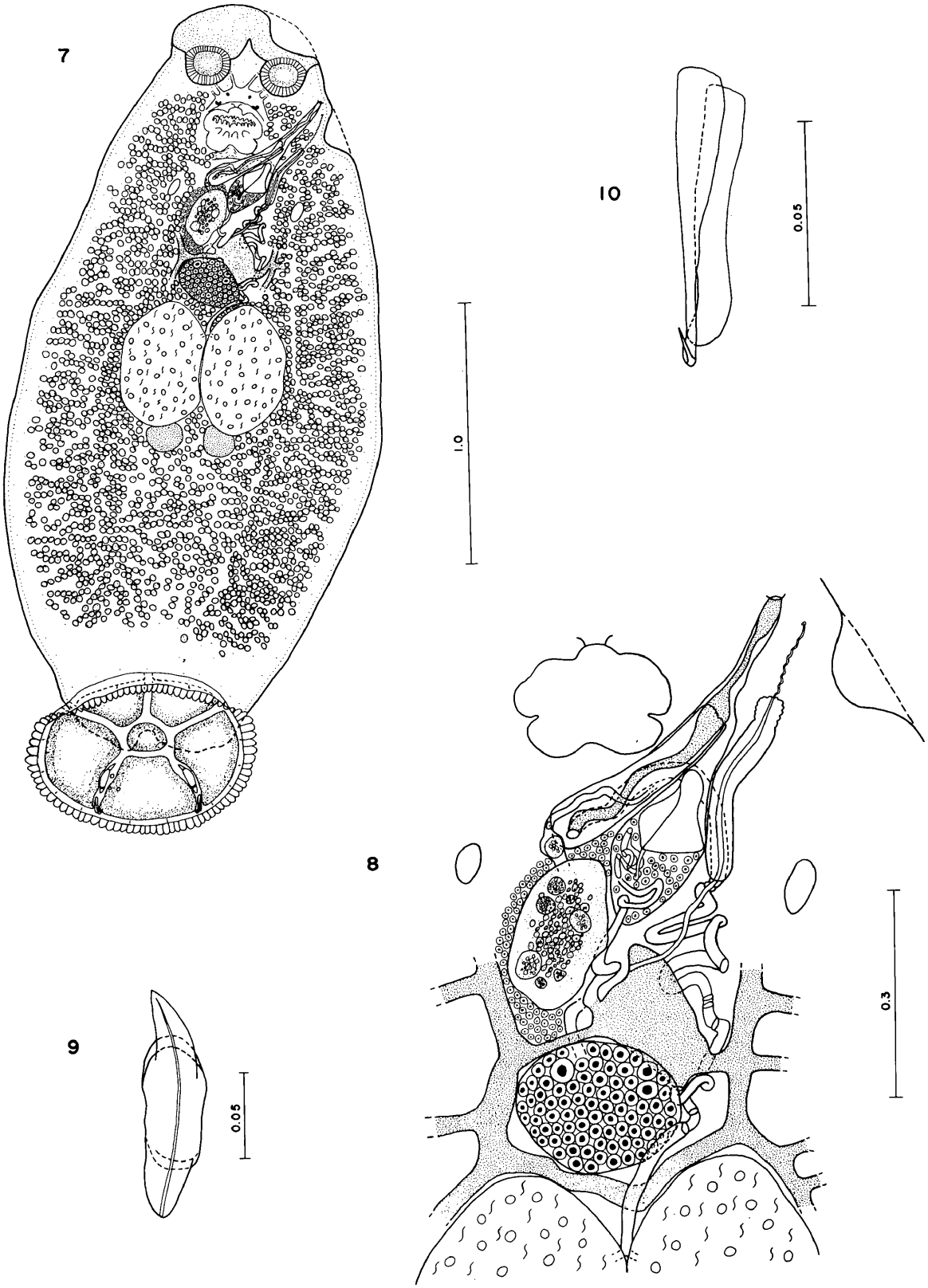
EXPLANATION OF PLATE IX

Allosprostonia tauvinae n. gen., n. sp.

Figs.

7. Whole mount, ventral view.
8. Reproductive organs and terminal genitalia, ventral view.
9. Left anteriormost anchor.
10. Left middle and posteriormost anchors.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EXPLANATION OF PLATE XIX

Macrophyllida antarctica (Hughes, 1928) Johnston, 1929

Figs.

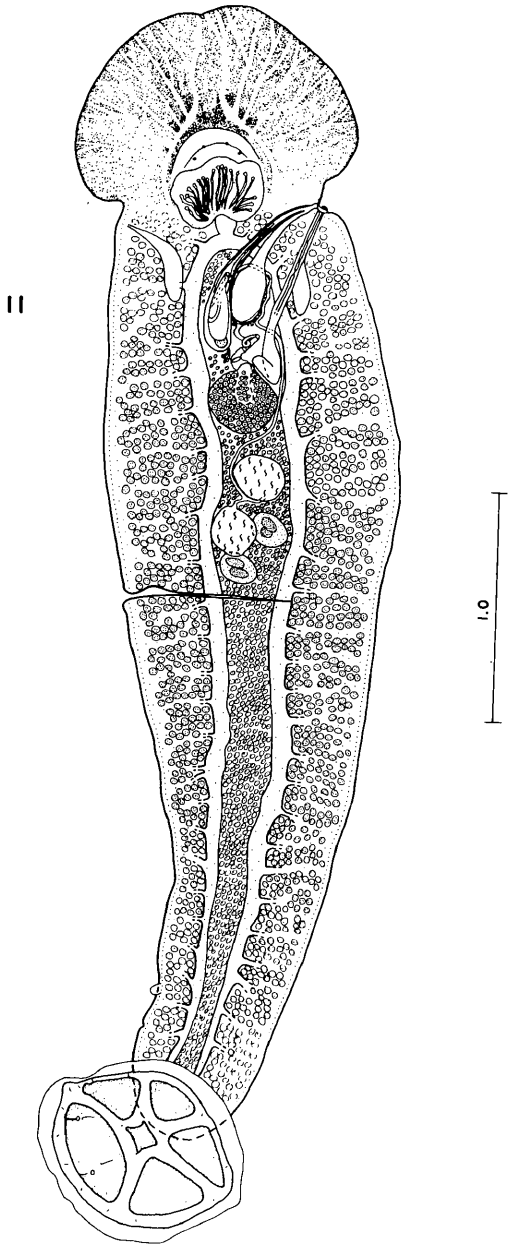
11. Whole mount, ventral view.

12. Reproductive organs and terminal genitalia, ventral view.

13. Left anteriormost anchor.

14. Right middle anchor.

15. Right posteriormost anchor.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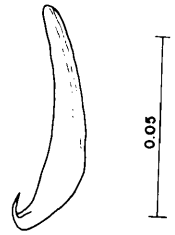
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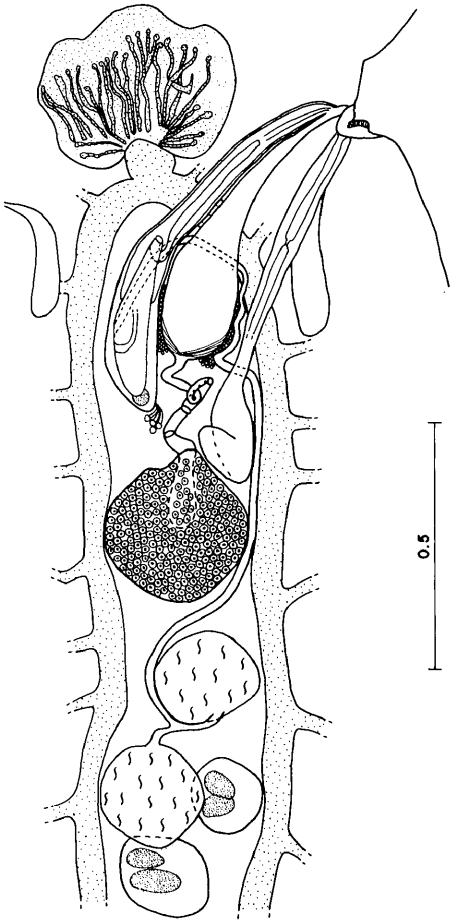
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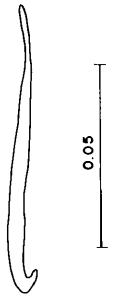
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EXPLANATION OF PLATE IV

Neobenedenia wilsoni n. sp.

Figs.

16. Whole mount, ventral view.

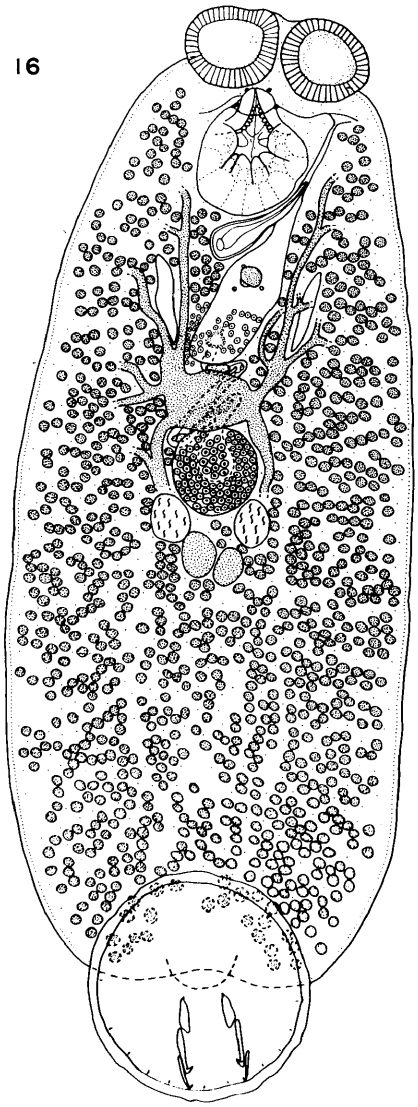
17. Reproductive organs and terminal genitalia, ventral view.

18. Left anteriormost anchor.

19. Left middle anchor.

20. Left posteriormost anchor.

16



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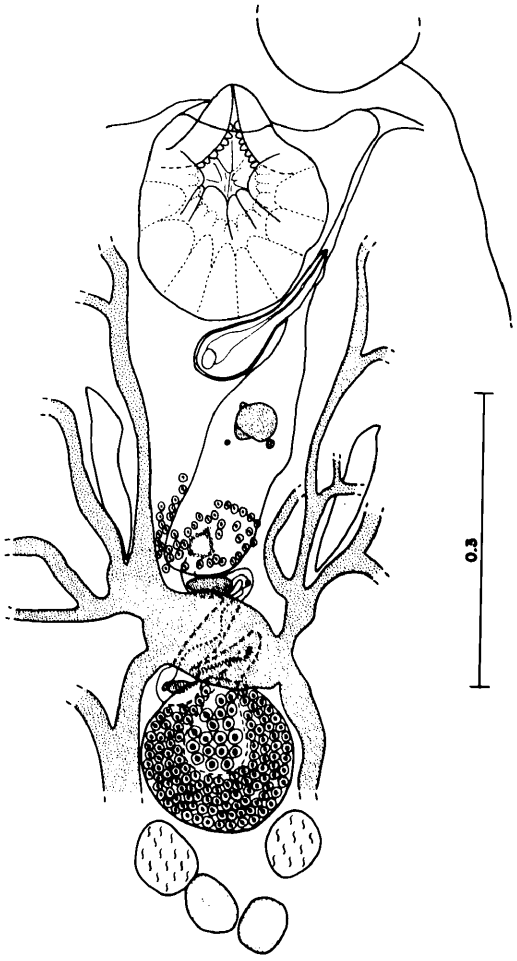

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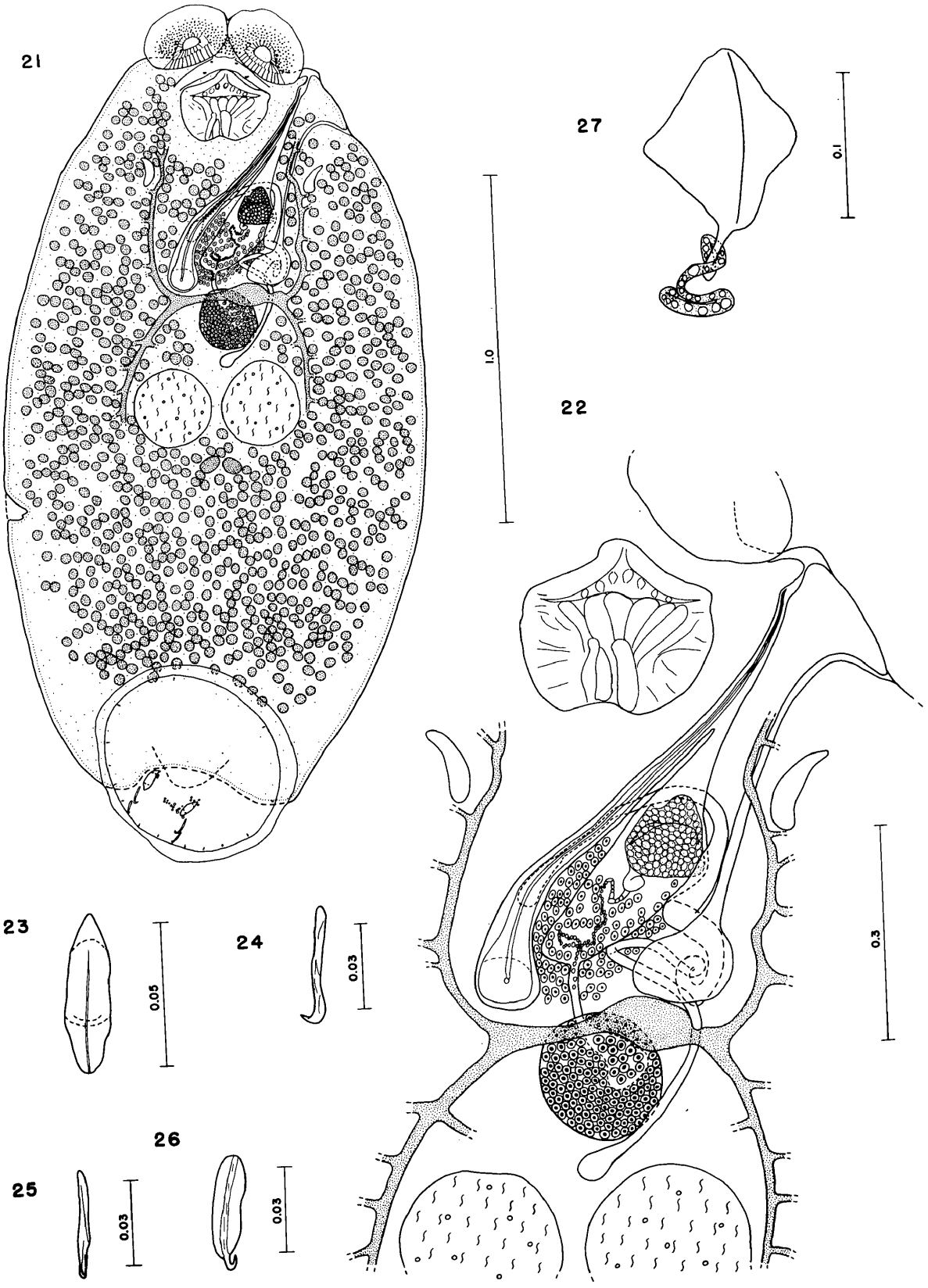
EXPLANATION OF PLATE V

Benedeniella cystovagina n. sp.

Figs.

21. Whole mount, ventral view.
22. Reproductive organs and terminal genitalia, ventral view.
23. Right anteriormost anchor.
24. Left middle anchor.
25. Left posteriormost anchor.
26. Left posteriormost anchor.
27. Egg *in utero*, ventral view.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EXPLANATION OF PLATE VI

Benedenia anteropulvi n. sp.

Figs.

28. Whole mount, ventral view.

29. Reproductive organs and terminal genitalia, ventral view.

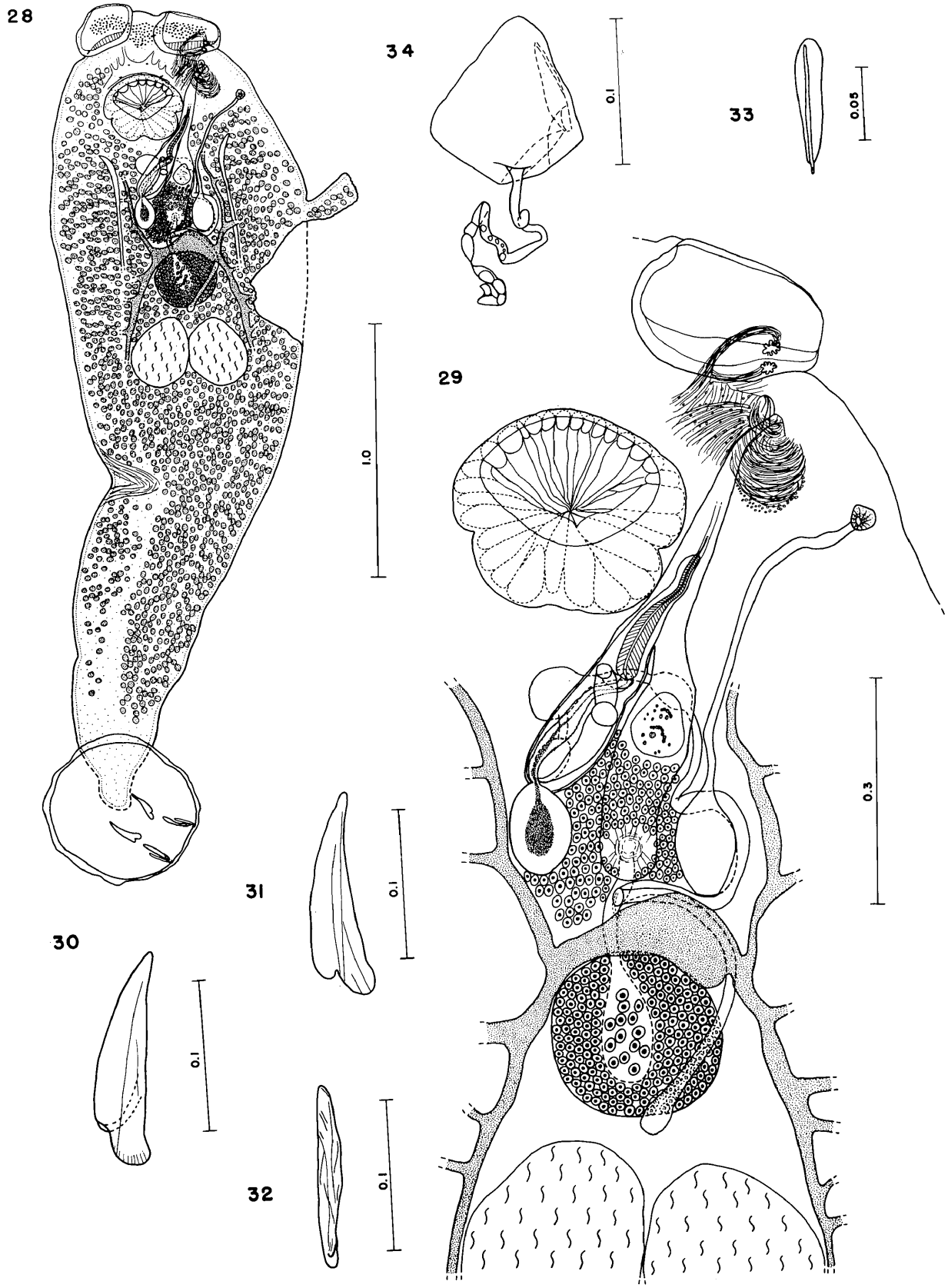
30. Right anteriormost anchor.

31. Right anteriormost anchor.

32. Right middle anchor.

33. Left posteriormost anchor.

34. Egg *in utero*, ventral view.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