

BIRD CESTODES OF CUBA I: CESTODES OF BIRDS OF THE ORDERS PODICIPEDIFORMES, PELECANIFORMES AND CICONIIFORMES

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ABSTRACT

Twenty species of cestodes, parasitic in Cuban birds, are described and discussed. These belong to 5 different families. They were collected between 1964 and 1968 by personnel of the Czechoslovakian and Cuban Academies of Sciences. Three of them are new to Science: *Paradilepis caballeroi*, parasitic in the cormorant *Phalacrocorax auritus floridanus*; *Parvitaenia caribaensis*, parasitic in the heron *Ardea herodias herodias*; and *Parvitaenia eudocimi*, parasitic in the ibis *Endocimus albus*.

RESUMEN

Se describen y discuten 20 especies pertenecientes a cinco familias diferentes de céstodos parásitos de aves de Cuba, recolectados entre los años 1964 y 1968, por personal de las Academias de Ciencias de Checoslovaquia y Cuba. Tres de ellas son nuevas para la Ciencia: *Paradilepis caballeroi*, parásita de *Phalacrocorax auritus floridanus*; *Parvitaenia caribaensis* parásita de *Ardea herodias herodias* y *Parvitaenia eudocimi* parásita de *Eudocimus albus*.

INTRODUCTION

During investigations into the parasite fauna of Cuba, undertaken as part of the agreement on the collaboration of the Czechoslovak and Cuban Academy of Sciences, we collected a large material of bird cestodes in the years 1964-1968. Our team consisting of several Czechoslovak and some Cuban research workers examined ca 1,500 birds. This is the first of a series on cestodes of birds from Cuba and deals with cestodes parasitic in 3 orders of birds. Descriptions of cestodes from other bird orders are in preparation.

In addition to the authors of this paper, Dr. V. Baruš, Dr V. Buša, Dr J. Groschaft, Dr J. Prokopič, N. Lorenzo Hernández, A. Coy Otero, J. de la Cruz and others assisted in collecting the cestode material. To all of them our sincerest thanks are due. We also wish to thank Ing. Héctor Sagué and Professor Dr. Abelardo Moreno, the former directors of the Biological Institute of the Cuban Academy of Sciences in Havana for their great help in organizing our expeditions throughout the whole territory of Cuba. The assistance of Mr.

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Family Tetrabothriidae Linton, 1891

1. *Tetrabothrius drygalskii* Szpotanska, 1929. Fig. 1

Host: *Phalacrocorax auritus floridanus* Audubon

Location: intestine

Locality: Ens. de Tío Pepe, province Camagüey, Cuba

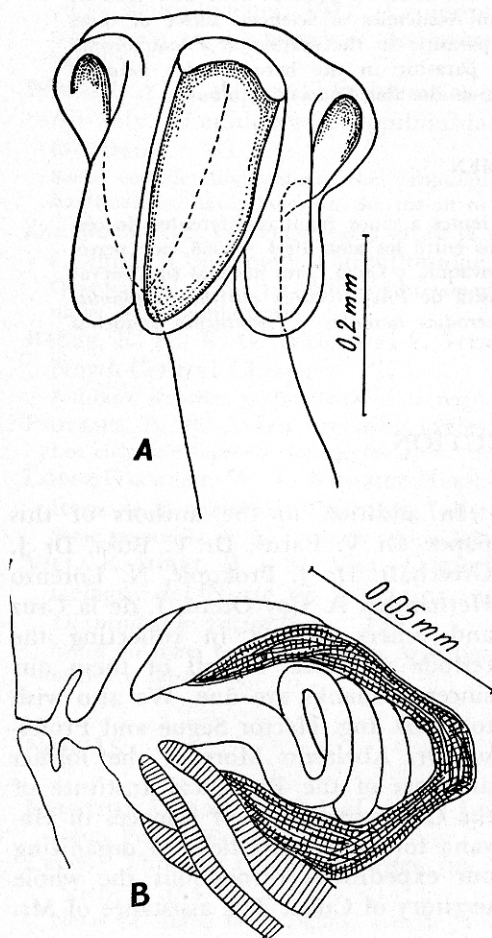


Fig. 1. *Tetrabothrius drygalskii* Szpotanska, 1929. A - scolex, B - genital atrium.

We found 4 immature specimens of this cestode in one of the two *Phalacrocorax auritus floridanus* examined. Overall length 10-48 mm, maximum width 0.520 mm. Scolex 0.360 to 0.390 mm in diameter, suckers elongate oval with typical auricular outgrowths.

The hermaphroditic segment contains 26-38 spherical testes surrounding the female sexual organs in the middle of the segment. Their diameter is 0.035-0.040 mm. The cirrus-sac measures 0.052-0.058 x 0.044-0.054 mm. The male atrium canal measures 0.054-0.060 mm. The walls of the vagina are thickened, the genital atrium relatively shallow. Because the cirrus-sac resembles in structure and size that of *T. drygalskii* Szpotanska, 1929, we have placed our specimens to this cestode species.

Family Dilepididae Railliet et Henry, 1909

2. *Cyclustera capito* (Rudolphi, 1819) Fuhrmann, 1904. Figs. 2, 3

Host: *Ajaia ajaia* Linnaeus

Location: intestine

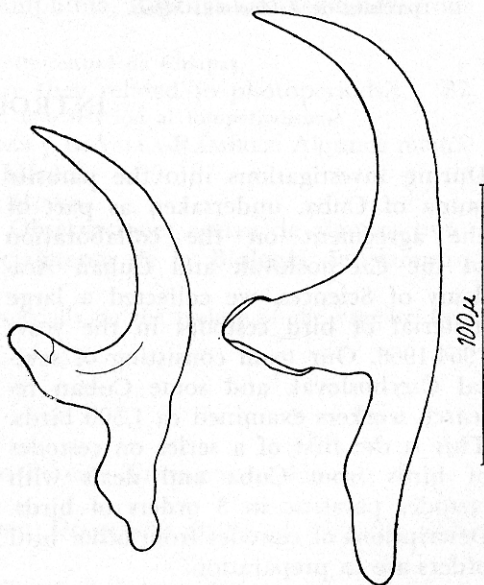


Fig. 2. *Cyclustera capito* (Rudolphi, 1819). Rostellar hooks.

Localities: Ciénaga de Zapata - Las Salinas, province Las Villas, Cuba
All 7 hosts examined were positive, the incidence was 14-283 specimens.

0.056 to 0.060 mm, the blade 0.04-0.096 mm.

The genital pores, although generally alternating regularly, have quite frequently been found to alternate irregularly. Therefore, we feel that this sign should not be included in the generic diagnosis. Cirrus-sac with thick walls, club-shaped, clearly divided into two parts, size 0.260 to 0.340 x 0.120-0.144 mm; it opens into the genital atrium. Depth of genital atrium, 0.078-0.104 mm. Cirrus 0.280 to 0.362 mm long, its whole surface is covered with fine spines. Testes spherical, 0.028-0.038 mm in diameter, numbering 36 to 44, surround the ovary and the vitelline gland.

Vagina opening into the genital atrium behind the cirrus-sac enlarges pouch-like behind the ventral poral excretory canal. Seminal receptacle situated in the center of the segment measures 0.164-0.186 mm in diameter, is surrounded by a very lobate ovary. This measures 0.190-0.264 mm in diameter. Vitelline gland lobate, 0.076-0.116 mm in diameter.

The tests disappear from segments in which the uterus is at a higher stage of development, the ovary is reduced to a small remnant and only the vitelline gland remains clearly visible. The uterus takes on the shape of a lobate ring situated in the center of the segment. Inside the ring are the remnants of the ovary, a clearly visible seminal receptacle and the vitelline gland. Later, the uterus enlarges until it occupies almost the whole of the segment, its shape resembles a rosette. All eggs in our material were still immature.

Overall length of body 5-16 mm, maximum width 0.8-1.3 mm. The conical scolex has a diameter of 0.920-1.064 mm. Suckers spherical or subspherical, size 0.328-0.408 mm in diameter. Rostellum 0.364-0.406 mm in diameter armed with 28 hooks arranged in two rows. The longer hooks measure 0.224-0.233 mm. Their guard measures 0.124-0.141 mm, the handle 0.087 to 0.093 mm, the blade 0.107-0.114 mm. The shorter hooks measure 0.167-0.180 mm, their guard 0.105-0.114 mm, the handle

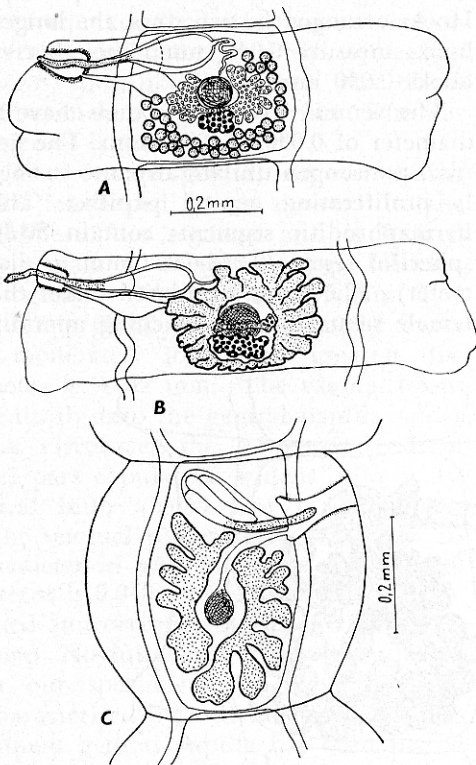


Fig. 3. *Cyclostera capito* (Rudolphi, 1819). A - sexually mature segment, B - segment with uterus, C - segment in expansion.

In this material we found two types of strobilae. A contracted strobila with almost parallel arranged lateral edges and segments broader than long (Fig. 3 A, B) and an expanded strobila with most irregular edges - the expansion of the segments is so irregular that some are almost spherical in shape (Fig. 3 C).

The latter modification seemed to have served as a basis for Fuhrmann's original description of this cestode species.

3. *Dendrouterina papillifera* (Fuhrmann, 1908). Fig. 4

Host: *Florida caerulea* Linnaeus

Location: intestine

Locality: La Jaula-Guanahacabibes, province Pinar del Río, Cuba

This cestode species was found only in a single specimen of *Florida caerulea* L. (7 cestodes).

Cestodes not fully mature with not fully mature eggs. The longest specimen with a preserved scolex measured 78.2

mm in length and 2 mm in width. Scolex 0.220 mm in diameter, suckers oval, measuring 0.132 mm in greater diameter. Only 14 hooks were preserved on the rostellum (Fuhrmann mentioned 20-22 in his original description of the species). Hooks arranged in two rows, the longer hooks measure 0.049 mm, the shorter hooks 0.030 mm.

The ventral excretory canals have a diameter of 0.030 to 0.040 mm. The genital pores open unilaterally into strongly proliferating genital papillae. The hermaphroditic segments contain 30-36 spherical testes (0.044-0.071 mm in diameter). The testes are placed under the female sexual organs, reaching aporally

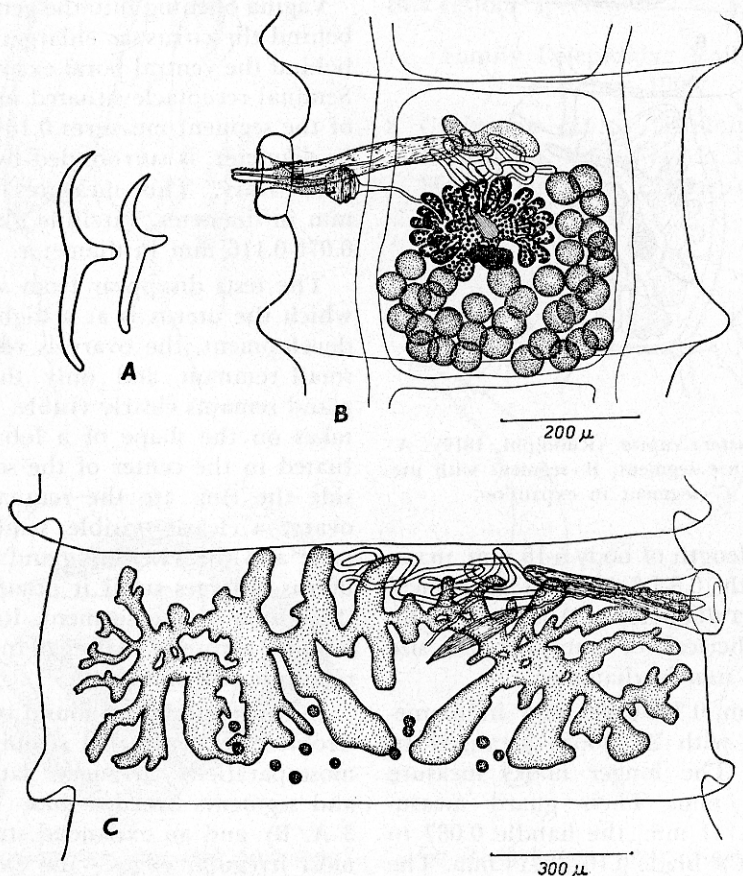


Fig. 4. *Dendrouterina papillifera* (Fuhrman, 1908). A - rostellar hooks, B - sexually mature segment, C - segment with developed uterus.

the upper half of the segments at the level of the upper edge of the ovary or beyond it. Size of cirrus-sac 0.246-0.281 x 0.048 mm. Cirrus conical, maximum width at the base 0.057 mm. Its surface is covered with fine spines which, however, are frequently shed (they were absent on several expanded cirri). In some segments, spine-like formations were observed even in the genital atrium. The vas deferens is much coiled.

The female genital organs consist of a fan-shaped ovary situated in the middle of the segment and is formed by a mass of relatively large follicles. Its greatest diameter is 0.492 mm. The vitelline gland placed under the ovary is moderately lobate, its greatest diameter is 0.132 mm. The vagina opens ventrally into the genital papilla under the cirrus-sac, the proximal end of the pars copulatrix widens into a typical bulb (0.055 mm in diameter). The seminal receptacle is fusiform its diameter in segments with a developed uterus is 0.040 mm. The uterus is branched and occupies the whole of the segment. No fully-formed eggs were found in our specimens. Our species being characterized by individuals with a prominent genital papilla has been placed to the species *Dendrouterina papillifera* Fuhrmann, 1908 in spite of the fact that they differ in some characters from the original description (slightly longer rostellar hooks or smaller measurements of the vitelline gland). In all other features our specimens are very similar to *D. papillifera*.

Baer and Bona (1960) tabulated a total of 8 species of the genus *Dendrouterina*: *D. herodiae* Fuhrmann, 1912, *D. macrosphincter* (Fuhrmann, 1901) Baer et Bona, 1960, *D. fuhrmanni* (Clerc, 1906) Baer et Bona, 1960, *D. babillifera* (Fuhrmann, 1908) Baer et Bona, 1960, *D. crassirostrata* (Fuhrman, 1908) Baer et Bona, 1960, *D. ardeae* (Rausch, 1955) Mahon, 1956, *D. philherodiae* Mahon,

1956 and *D. australensis* Baer et Bona, 1960.

Mathevossian (1963) not knowing Baer and Bona's paper, placed only 7 species to the genus *Dendrouterina*. These are: *D. herodiae* Fuhrmann, 1912, *D. ardeae* (Rausch, 1955), *D. botauri* Rausch, 1948, *D. fuhrmanni* (Clerc, 1906), *D. fovea* Meggitt, 1933, *D. mackoi* Mathevossian, 1963 and *D. philherodiae* Mahon, 1956. She listed the species *D. papillifera* (Fuhrmann, 1908) and also *D. macrosphincter* (Fuhrmann, 1908) to the genus *Dilepis* Weinland, 1858. On the other hand, this author left the species *D. botauri* Rausch, 1948 within the genus *Dendrouterina* which Baer and Bona, had placed in synonymy with *D. fuhrmanni* (Clerc, 1906) and also the species *D. fovea* Meggitt, 1933, which had been rejected by Rausch (1948) as not being species belonging to this genus, this was confirmed by Baer and Bona (1960). Doubtful remains only the species *D. mackoi* Mathevossian, 1963. Its basic characteristics are the same as those given in the generic diagnosis of the genus *Dendrouterina* Fuhrmann, 1912 by Baer and Bona, 1960. In our opinion it belongs to this genus and, therefore, another species must be added to the list given by Baer and Bona (1960).

4. *Paradilepis caballeroi* sp.nov. Fig. 5

Host: *Phalacrocorax auritus floridanus* Audubon

Location: intestine

Locality: Salinas de Zapata — province Las Villas, Cuba

This species was found only in one out of the 8 *Phalacrocorax auritus floridanus* examined; of the 4 specimens recovered 3 were immature. The most developed specimen has been described as the holotype.

Holotype: Length of strobila 3.8 mm, maximum width 0.445 mm. Scolex con-

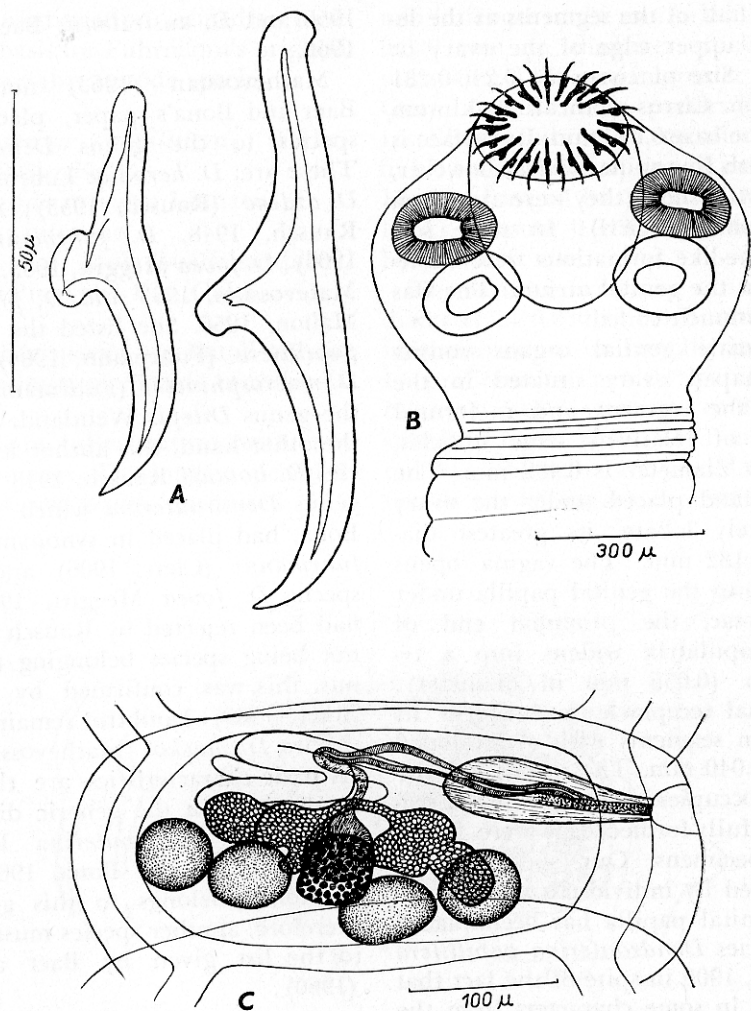


Fig. 5. *Paradilepis caballeroi* sp. nov. A - rostellar hooks, B - scolex, C - sexually mature segment.

siderably broader than the widest segment of the strobila, measuring 0.742 mm in diameter. Suckers oval, 0.176 to 0.184 mm in diameter. Rostellum 0.233 mm in diameter with 24 hooks arranged in two rows. Length of longer hooks 0.105 mm, their root measures 0.058-0.061 mm, their blade 0.051-0.052 mm. Length of shorter hooks 0.081-0.082 mm, their root measures 0.044 mm, their blade 0.037-0.038 mm.

The strobila consists of 35 segments, in the last segments we found the anlage of a developing uterus. The genital pores in the segments are unilateral and always open on the left side of the strobila. Size of the cirrus-sac in the hermaphroditic segments 0.156 x 0.039 mm. In none of the specimens did we find a fully expanded cirrus but judging from the outlines of the spines shining through it seems to be cylindrical and

about 0.120 mm long. The longest spines were observed on the base of the cirrus (0.007 mm) towards the top of the cirrus they reduce in length. The cirrus-sac opens in to the genital atrium which is ca 0.040 mm deep. The vas deferens forms instead of an outer seminal sac several loops in the upper half of the segment.

The segments contain generally 4 spherical or oval testes, size 0.048-0.071 x 0.040-0.048 mm situated in the lower half of the segment. Because, in younger segments, the testes change their position, 2-3 overlaying testes are found on the aporal side of the segment. The ovary consists of two strongly lobate parts joined by a narrow commisure, its greatest diameter is 0.198 mm. The vitelline gland is compact and measures ca 0.050 mm in diameter.

The vagina opens ventrally under the opening of the cirrus-sac. The pars copulatrix vaginae is 0.136 mm long, its walls are considerably more muscular than those of the other parts of the vagina. The slightly expanded proximal pars copulatrix passes into the narrow pars intermedia vaginae. This widens above the vitelline gland into an oval seminal receptacle (0.051-0.061 mm). No fully developed uterus or eggs were found in our specimens. Paratypes: These consist of 3 specimens which are smaller and less developed than the holotype. Length 1.912-2.625 mm, maximum width 0.450-0.525 mm. Scolex always broader than strobila. Diameter of scolices 0.675-0.706 mm. Suckers spherical or oval, their greatest diameter is 0.173-0.227 mm. Greatest diameter of rostellum is 0.238 mm. We found 24 hooks in two specimens, 23 in one specimen. In the latter a distinct groove in the rostellum indicates the presence of the 24th hook which must have fallen off. Length of shorter hooks 0.079-0.081 mm, of longer hooks 0.108-0.112 mm. Strobila with 15-24 seg-

ments. Genital pores unilateral. The topography of the other inner organs is in accord with that of the holotype.

Differential diagnosis

Our specimens differ in several signs from the species of the genus *Paradilepis* Hsü, 1935 hitherto described from birds; their scolex is longer than that of *P. scolecina* (Rudolphi, 1819); according to Mahon, 1956, the scolex of *P. scolecina* measures 0.170-0.387 mm in diameter while the scolex of our specimens is twice as big. In view of the larger scolex also the rostellum and the suckers are larger. All these signs, however, are present in *P. delachauxi* Fuhrmann, 1909, in which the measurements of the scolex (0.500-0.915 mm) of the suckers and the rostellum are similar to those of our species. Different, however, is the number of rostellar hooks, which is 24 in our specimens, but only 20-22 in *P. scolecina* and *P. delachauxi*. While the number of hooks of our species resembles that of *P. kempi* Southwell, 1921 (20-26 hooks), these are longer in the latter (the longer hooks measures 0.153-0.190 mm, the shorter 0.108-0.135 mm). The cirrus-sac of our species is similar to that of *P. scolicina*, but is considerably shorter than the cirrus-sac of *P. dalachauxi*. Our species differs from the remaining species of the genus *Paradilepis* in the following characters.

The species *P. simoni* Rausch, 1949 has 36 rostellar hooks and 5 testes. The species *P. longivaginosus* Mayhew, 1925, transferred by Mathevossian (1963) from the genus *Oligorchis* to the genus *Paradilepis*, has 20 rostellar hooks measuring only 0.088-0.092 mm in length. The species *P. macracantha* Joyeux et Baer, 1935 differs in the more than three times longer hooks, the species *P. ruivaginosus* Freeman, 1954 has 32 rostellar hooks and the species *P. yorkei* Kotlán, 1923,

also transferred by Mathevossian (1963) to the genus *Paradilepis* from the genus *Oligorchis*, has considerably longer hooks (the longer hooks are 0.148-0.151 mm, the shorter hooks 0.135 mm). The hithert known hosts and their geographical distribution are tabulated in Table 1.

5. *Parvitaenia aurita* (Rudolphi, 1819).
Fig. 6

Syn.: *Taenia aurita* Rudolphi, 1819,
Anomotaenia aurita Fuhrmann,
1908

Host: *Hydranassa tricolor ruficollis*
Gosse

Location: intestine

Locality: Santo Tomás, Ciénaga de Zapata, province Las Villas, Cuba

These cestodes were found in two of the hosts examined (one and two specimens). Since none of the specimens were fully mature we are describing only the most developed one.

Overall length 42.2 mm, maximum width 1.259 mm. Scolex 0.899 mm in diameter (these sizes are smaller in the other specimens —0.599, 0.634 mm). Sucker spherical, 0.190 to 0.236 mm in diameter. Rostellum 0.327 mm in diameter with 20 hooks arranged in two rows. Length of longer hooks 0.237 to 0.242 mm, of shorter hooks 0.176–0.180 mm.

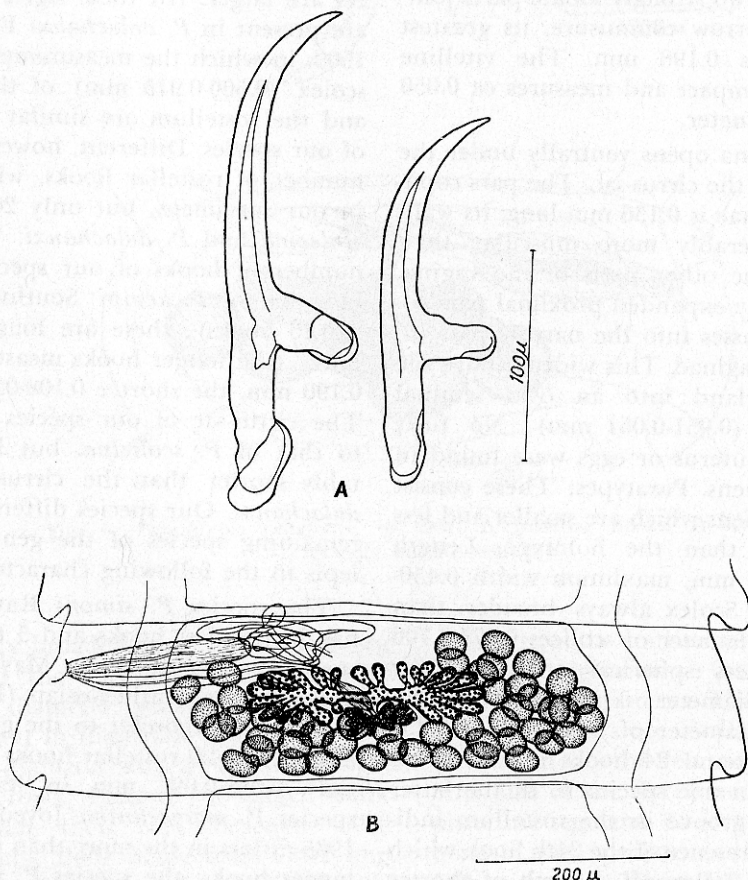


Fig. 6. *Parvitaenia aurita* (Rudolphi, 1819). A - rostellar hooks, B - sexually mature segment.

TABLE 1

SPECIES OF THE GENUS *PARADILEPIS* HSÜ, 1935 AND THEIR GEOGRAPHICAL DISTRIBUTION[illegible]

The ventral excretory canals in the hermaphroditic segments measure 0.060-0.068 mm in diameter. The genital pores alternate irregularly in the segments, their openings are situated in the upper half of the lateral edge of the segments. The oval testes number 45-58. Their greatest diameter is 0.058-0.64 mm. They are situated in the lower half of the segment and at both sides of the ovaries. On the aporal side the testes rise beyond the ovary. Cirrus-sac elongate fusiform, size $0.176-0.202 \times 0.044$ mm. The vas deferens forms large elongate loops and occupies almost the entire poral part of the upper half of the segment.

The ovary, formed by numerous follicles, is very lobate. It lies in the middle of the segment, its transverse diameter is about 0.300 mm. Also the vitelline gland is lobate, situated behind the ovary, its size is about 0.100 mm in its greatest diameter. In older segments the pyriform seminal receptacle lying exactly in the middle of the segment is clearly visible. The uterus originally a slightly backwards bent arched tube

ultimetal, widens and forms lobes. No eggs were found in our specimens.

Our species differs from the original description of *P. aurita* in the moderately smaller rostellar hooks (the longer hooks of the original material measure 0.260-0.264 mm, the shorter hooks 0.202-0.215 mm). In the original description the number of testes for *P. aurita* is 33-36 we found, however, 45-58 testes in our specimens. Because all other signs are in accord with the original description, we have placed it to the species *Parvitaenia aurita* (Rudolphi, 1819), Baer et Bona, 1960.

6. *Parvitaenia caribaensis* sp. nov. Fig. 7

Host: *Ardea herodias herodias* Linnaeus

Location: intestine

Locality: Salinas de Ciénaga de Zapata, province Las Villas, Cuba

We recovered 53 specimens of this cestode from the intestine of a single specimen of *A. herodias*.

Holotype: Not fully mature cestodes, overall length 4.88 mm, maximum width 0.700 mm. Scolex spherical, 0.805 mm

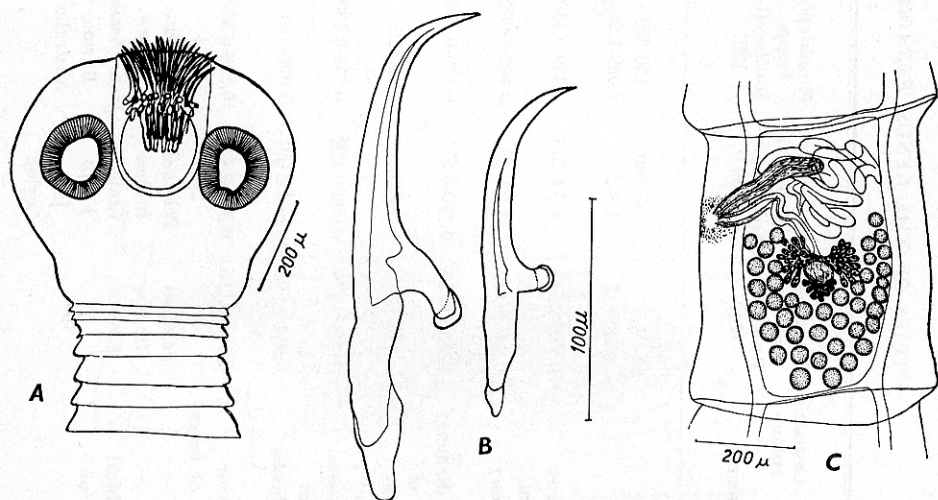


Fig. 7. *Parvitaenia caribaensis* sp. nov. A - scolex, B - rostellar hooks, C - sexually mature segment.

in diameter, broader than the strobila. Suckers moderately oval, $0.264-0.281 \times 0.220$ mm. Rostellum 0.254 mm in diameter, on it 20 hooks arranged in two rows. Size of longer hooks 0.215 mm; their handle measures $0.086-0.091$ mm, the guard curving towards the handle measures 0.029 mm. Length of blade 0.101 mm, distance between the peak of the guard and the peak of the blade 0.130 mm. The shorter hook measures $0.143-0.151$ mm, the handle 0.052 to 0.058 mm, the blade $0.074-0.078$ mm.

The strobila consists of 18 segments which, at first, are broader than long; ultimately the hermaphroditic segments become considerably longer than broad.

The genital pores alternate irregularly and open in the upper third of the lateral margins of the segments. The anlage of the reproductive organs occurs in the 8th-13th segment. The testes in the hermaphroditic segments number 32 to 41, they are spherical in shape and have a diameter of 0.052 mm. The testes are situated in the lower half of the segments, laterally they reach or project slightly beyond the upper edge of the ovary. The cirrus-sac measures 0.237×0.044 mm and reaches the median line of the segment. The vas deferens is much coiled.

The vagina, a curving tube, opens behind the opening of the cirrus-sac. Ovary two-winged, very lobate, formed by numerous follicles, is situated in the middle of the segment and measures up to 0.185 mm in diameter. The lobate vitelline gland lies at the level of the posterior edge of the ovary behind the small seminal receptacle. Its diameter is 0.062 mm. No eggs were observed in this not fully mature specimen.

Paratypes: The longest specimens measure $5.2-5.9$ mm, maximum width 0.615 mm. The number of segments is 20-23. All specimens recovered were not

fully mature having reached only the stage in which the sexual organs have completed development. In some specimens the hermaphroditic segments are broader than wide. The greatest diameter of the scolex is $0.369-0.614$ mm, the suckers measure $0.158-0.220 \times 0.140$ to 0.220 mm and are slightly oval or sub-spherical in shape. The rostellar pouch is spherical, 0.200 mm in diameter. The rostellum bears 20 hooks in two rows, the longer hooks measure $0.206-0.228$ mm, the shorter $0.149-0.158$ mm. The morphology and structure of the sexual organs in the same as that of the holotype. The cirrus-sac measures 0.299 by 0.048 mm; the greatest diameter of the ovary is $0.132-0.220$ mm, of the vitelline gland $0.049-0.088$ mm, of the seminal receptacle 0.123 mm.

Differential diagnosis

Of the hitherto described species of the genus *Parvitaenia* Burt, 1940 sensu Baer and Bona 1960 the following species resemble our species with regard to the shape and size of the hooks:

- 1) *Parvitaenia magna* Baer, 1959 — differs from our species in the considerably smaller number of testes; 8 testes against 32-41 testes in our species
- 2) *Parvitaenia aurita* (Rudolphi, 1819) — our species differs in the slightly different shape of the hooks and in the smaller length of the shorter rostellar hooks. The shorter hooks of our material are $0.143-0.151$ mm long, those of *P. aurita* $0.176-0.180$ mm. Also the number of testes is smaller in *P. aurita* (33-36) and the cirrus-sac is shorter than that of our species.

From the species of the genus *Parvitaenia*, in which no scolex was found yet, our species differs in the following characters:

The species *Parvitaenia ardeae* (Johnston, 1911) has testes arranged into two distinct groups, one placed above, the other below the female sexual glands.

The holotype and paratypes are deposited in the Helminthological Institute of the Slovak Academy of Sciences in Košice under the no. 1673c - Cuba.

7. *Parvitaenia eudocimi* sp. nov. Figs 8-11

Host: *Eudocimus albus* Linnaeus

Academy of Sciences in Košice under the no. 1607x - Cuba, the paratypes are deposited in the same Institute and in the Institute of Parasitology of the Czechoslovak Academy of Sciences, in Prague.

Holotype: The length is 3.180 mm, the maximum width in about the middle part of the strobila is 0.636 mm; the strobila becomes attenuated in caudal direction. The scolex has a diameter of 0.704 mm, the oval suckers measure 0.202-0.211 x 0.154-0.167 mm. The rostellum has a diameter of 0.299 mm and bears 22 hooks in two rows. The shorter hooks measure 0.184 to 0.189 mm, their guard attains a length of 0.070 mm, the

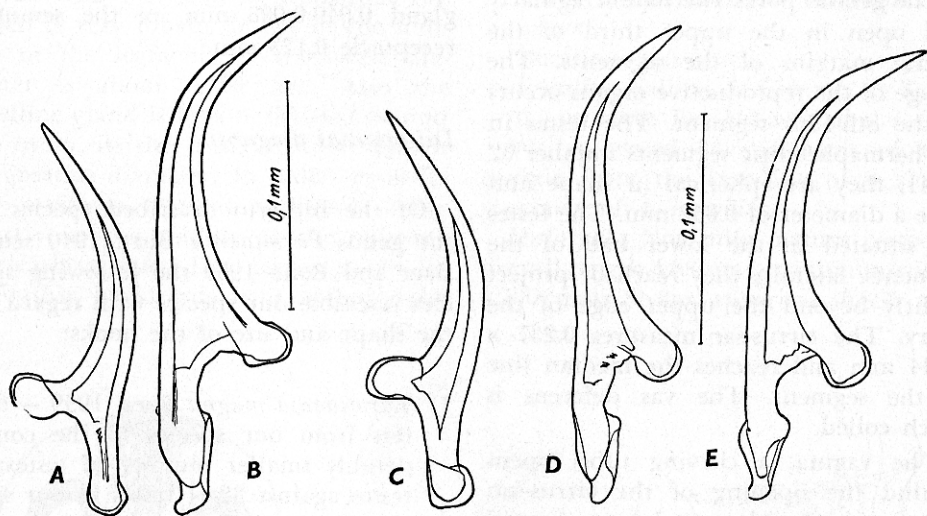


Fig. 8. *Parvitaenia eudocimi* sp. nov. A, B - rostellar hooks of specimens from *Eudocimus albus*, C, D, E - rostellar hooks of specimens from *Casmerodius albus*.

Location: intestine

Locality: Salinas de Ciénaga de Zapata, Santo Tomás de Zapata, province Las Villas, Cuba.

Of the 5 specimens of *Eudocimus albus* examined this cestode species was recovered from 4 of them (3-47 cestodes).

The holotype is deposited in the Helminthological Institute of the Slovak

Academy of Sciences in Košice under the no. 1607x - Cuba, the paratypes are deposited in the same Institute and in the Institute of Parasitology of the Czechoslovak Academy of Sciences, in Prague.

The number of segments in the strobila are 16, the last segments are not yet completely mature. The ducts of the genital organs are alternating irregularly and open in the anterior half of the

segment. Sexual organs begin to appear in the 5th segment already. The testes form 2 groups, one situated porally, the other apporally. Each group contains 10-14 testes, the overall number of testes is 21-26. The testes are spherical till oval and measure $0.058-0.068 \times 0.064$ to 0.076 mm. The cirrus-sac with its muscular wall reaches almost the mid-line of the segment; it measures $0.168-0.211 \times 0.060-0.079$ mm. Inside it lies a clearly visible coiled cirrus covered with fine spines which, when fully extruded measures 0.620 mm in length. The vas deferens is much coiled.

The female genital organs begin to appear in the 8th segment. Sexually mature segments contain a much lobate ovary divided into to parts which measures $0.288-0.322$ mm in greatest diameter. In the more mature segments the ovary overlays almost completely the testes, while in the younger segments it covers it only partly. The vitelline gland lies on the mid-line of the segment behind the ovary and is moderately lobate, compact, its diameter is 0.084 mm. The tube-shaped vagina opens under the opening of the cirrus-sac. The seminal receptacle is oval, its diameter is 0.058 mm; it is placed in about the middle of the segment. The uterus starts to develop in the hermaphroditic segments; its shape resembles a moderately backwards bent tube which, in the older segments, thickens, becomes lobate and, ultimately takes on its horse-shoe shape. No fully mature eggs were found in the holotype.

Paratypes: Strobila length $2.480-4.876$ mm, maximum width $0.487-0.848$ mm. The scolex has a diameter of $0.487-0.672$ mm, the suckers are oval, their greatest diameter is 0.228 mm. The rostellum carries 22 hooks (in one of the specimens we found only 20 hooks) arranged

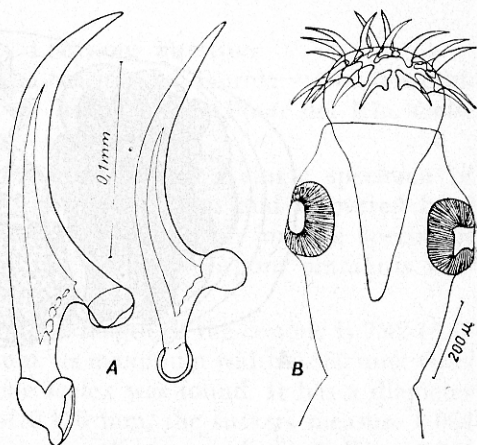


Fig. 9. *Parvitaenia eudocimi* sp. nov. A - rostellar hooks of specimens from *Phalacrocorax auritus floridanus*, B - scolex.

in two rows. The longer hooks measure $0.221-0.237$ mm, the shorter hooks 0.193 mm. The structure of the genital organs is similar to that of the holotype except for a certain variability in the alternation of the genital pores. This alternation was regular in some of the specimens. In several strobilae the testes form a single group.

The species *Parvitaenia eudocimi* sp. nov. was obtained also from other host species such as *Pelecanus occidentalis*, *Casmerodius albus*, *Phalacrocorax auritus* and *Phalacrocorax mexicanus*. The cestodes collected from these birds differed in some details from the holotype but never so much as to place them to another species.

The most mature specimen collected from *Pelecanus occidentalis* from the locality Cabo Francés, province Pinar del Río, measured 5.800×0.636 mm. The scolex of these specimens from this hosts has a diameter of $0.475-0.492$ mm, the suckers measure $0.176-0.220 \times 0.180-0.193$ mm. The rostellum has a diameter of $0.225-0.277$ mm. It carries 20 hooks in two rows. The longer hooks measure

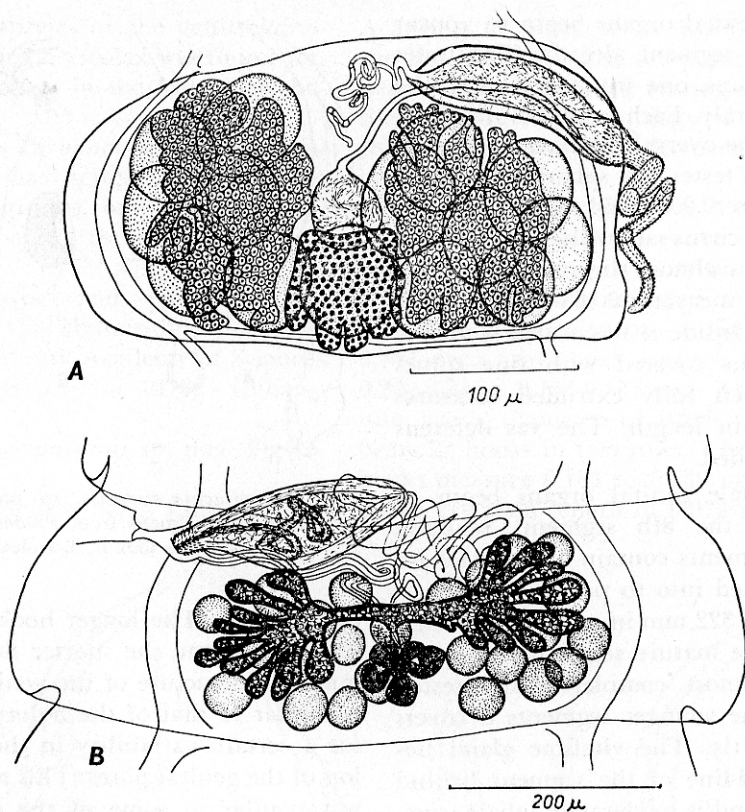


Fig. 10. *Parvitaenia eudocimi* sp. nov. A, B - sexually mature segments with variously shaped ovary and vitelline gland.

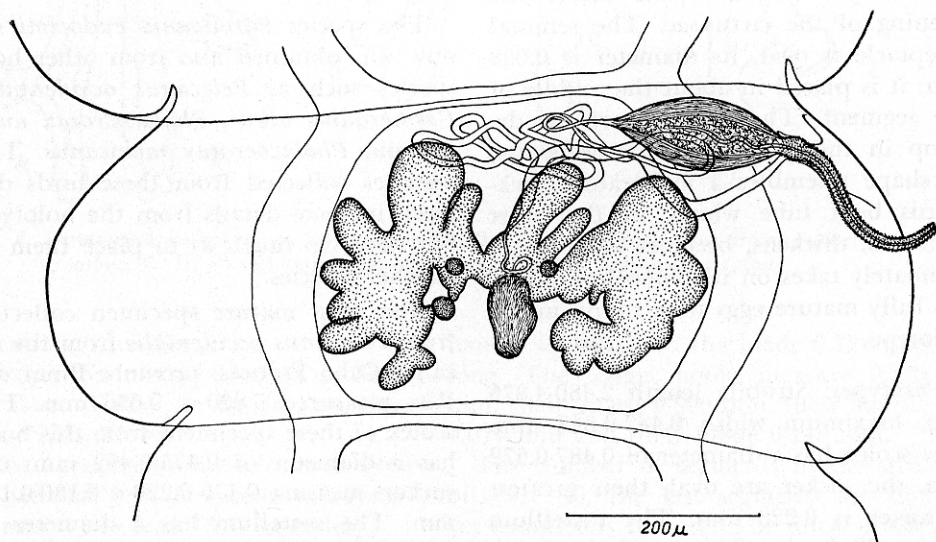


Fig. 11. *Parvitaenia eudocimi* sp. nov. Segment with developed uterus.

0.228 mm, the shorter hooks 0.171 to 0.181 mm. The difference is in the number of hooks (20); in specimens from *Eudocimus albus* the hooks number generally 22.

Also in specimens from *Casmerodius albus* from the locality Laguna Grande La Gloria, province Pinar del Río and from Santo Tomás de Zapata, province Las Villas did we find only 20 rostellar hooks, the longer hooks measured 0.222-0.228, the shorter 0.176 to 0.184 mm. In immature specimens of *Phalacrocorax auritus* the hooks on the rostellum numbered 20, the longer measured 0.228-0.238 mm, the shorter 0.188-0.193 mm.

Differential diagnosis

The species hitherto described from the genus *Parvitaenia*, which have rostellar hooks longer than 0.150 mm differ from the species *Parvitaenia eudocimi* sp. nov. in the length of the cirrus which, when fully extruded, measures 0.620 mm. Our species can be distinguished from the species *P. magna* Baer, 1959 in the higher number of testes, from the species *P. caribaensis* sp. nov. in the shape of the hooks and the length of the shorter hooks. Another differentiating sign is the strong, muscular cover of the cirrus-sac and the lesser number of testes.

Our species differs from *P. aurita* (Rudolphi, 1819) in the completely different shape of the hooks, in the structure of the cirrus-sac and the lesser number of testes; from the species *P. ardeae* (Johnston, 1911) it differs in the arrangement of the testes in two lateral groups, while the testes of *P. ardeae* are situated in two groups above and under the female genital organs.

8. *Valipora mutabilis* Linton, 1927.

Fig. 12

Host: *Butorides virescens maculatus*
Boddaert

Location: intestine

Locality: La Florida - Guanahacabibes, province Pinar del Río, Cuba

We examined a single specimen of *Butorides virescens* and recovered from it 14 not completely mature specimens of the cestode *Valipora mutabilis* Linton, 1927.

The length of the cestode is 7.42-15.20 mm, its maximum width 0.360 mm. Only one scolex was found. It has a diameter of 0.136 mm, the suckers measure 0.064 mm in diameter, the rostellum 0.044

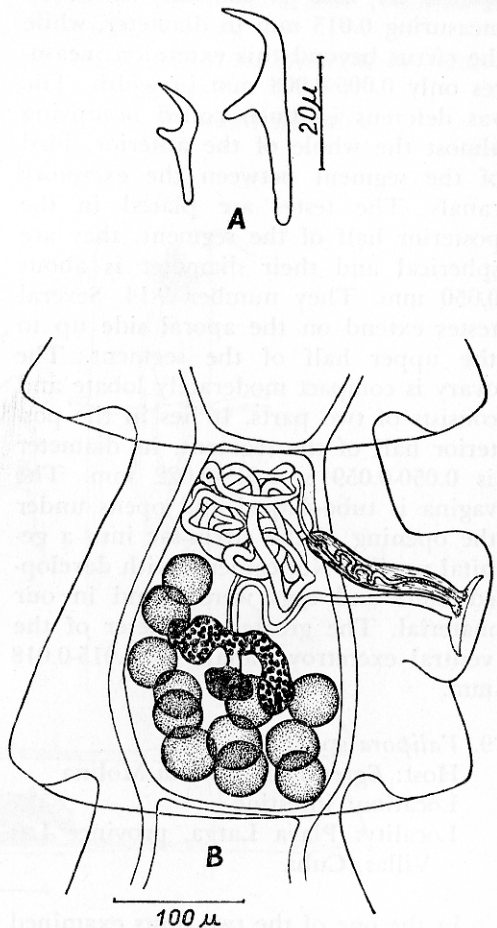


Fig. 12. *Valipora mutabilis* Linton, 1927. A - rostellar hooks, B - sexually mature segment.

mm. The hooks on the rostellum are arranged in two rows, the longer measure 0.039 mm, the shorter 0.016-0.018 mm. The guard of the longer hooks measures 0.023 mm, the handle 0.021 mm, the blade 0.013 mm. The guard of the shorter hooks measures 0.010 mm, the blade 0.008 mm.

In the sexually mature segments the genital apertures are unilateral and open into the extremely developed genital papilla, which measures 0.123 mm in its greatest diameter. The cirrus-sac measures 0.146-0.158 x 0.030-0.033 mm. The apical end of the cirrus is covered with spines, its base is conically extended measuring 0.015 mm in diameter, while the cirrus beyond this extension measures only 0.006-0.008 mm in width. The vas deferens is much coiled occupying almost the whole of the anterior third of the segment between the excretory canals. The testes are placed in the posterior half of the segment, they are spherical and their diameter is about 0.050 mm. They number 9-14. Several testes extend on the aporal side up to the upper half of the segment. The ovary is compact moderately lobate and consists of two parts. It lies in the posterior half of the segment, its diameter is 0.050-0.059 x 0.019-0.022 mm. The vagina is tube-shaped and opens under the opening of the cirrus-sac into a genital papilla. No segments with developed uteri and eggs were found in our material. The greatest diameter of the ventral excretory canals is 0.015-0.018 mm.

9. *Valipora* sp. I. Fig. 13

Host: *Egretta thula thula* Molina

Location: intestine

Locality: Playa Larga, province Las Villas, Cuba

In the one of the two hosts examined we found 3 immature strobilae without scolices.

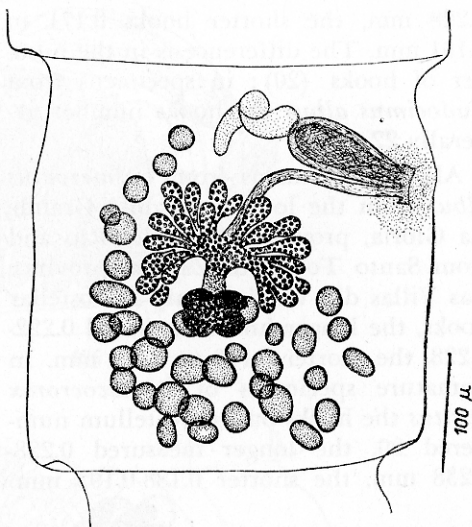


Fig. 13. *Valipora* sp. I. Sexually mature segment.

The fragments of the strobilae measure 21.2-22.3 by 0.466 mm. Genital pores unilateral, testes in the hermaphroditic segments spherical till oval, number of testes in the segment 30-36. These are placed mainly in the posterior half of the segment, some of them reach the aporal side beyond the ovary level. They have a diameter of 0.017-0.044 mm. The cirrus-sac is about 0.150 mm long and opens in the first third of the lateral edge of the segment. The vas deferens has a diameter of 0.020 mm and forms several coils. The fan-shaped ovary is much lobate and formed by numerous follicles. It lies in the center of the segments and has a diameter of 0.176 mm. The vitelline gland is compact, forms small lobes, its diameter is 0.074 mm.

10. *Valipora* sp. II. Fig. 14

Host: *Casmerodius albus egretta* Gmelin

Location: intestine

Locality: Laguna Grande La Gloria, province Pinar del Río, Cuba

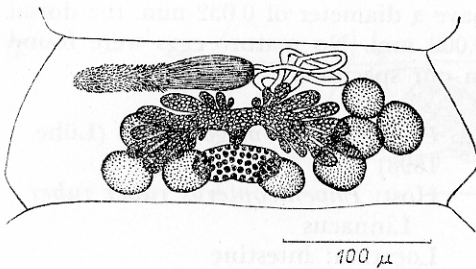


Fig. 14. *Valipora* sp. II. Sexually mature segment.

Of the 6 hosts examined fragments of the strobila were found only in one host. These are 1.314 mm long and 0.290 mm wide. No scolex was found. Genital pores unilateral, the spherical till oval testes in the segments number 6-8 and have a diameter of 0.039 mm. They are placed under the ovary and

on the aporal side of the segment. The cirrus-sac is not clearly visible, it reaches the center of the segment and measures 0.146×0.26 mm. The cirrus spinose. The vas deferens is much coiled. The ovary is much lobate, transversely elongated, its greatest diameter is 0.126-0.180 mm. The vitelline gland is compact, size 0.052-0.068 mm and lies under the ovary on the median line of the segment.

Family Hymenolepididae Railliet
et Henry, 1909

11. *Drepanidotaenia ardeae* (Fuhrmann, 1906). Fig. 15

Host: *Butorides virescens maculatus*
Boddaert

Location: small intestine

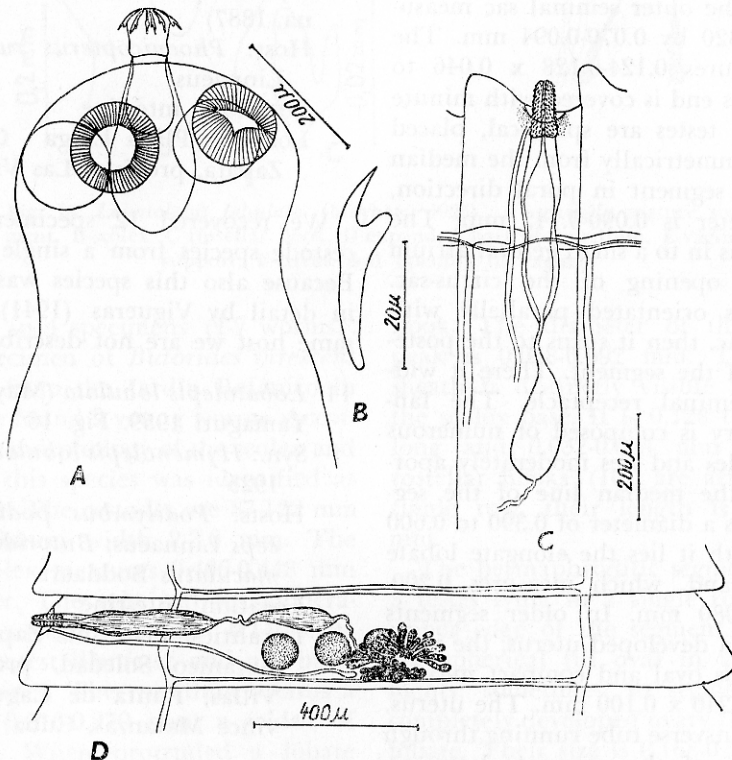


Fig. 15. *Drepanidotaenia ardeae* (Fuhrmann, 1906). A - scolex, B - rostellar hook, C - cirrus pouch and cirrus, D - sexually mature segment.

Localities: Península Zapata - St. Tomás, province Las Villas; Punta de Hicacos, province Matanzas, Cuba

Of the 11 *Butorides virescens* examined this cestode species was recovered from 5 specimens, the number of cestodes in these hosts was 1-6.

The cestode is 121-183 mm long and 3 mm wide. The spherical scolex has a diameter of 0.400-0.440 mm. The spherical suckers measure 0.144-0.172 mm in diameter, the rostellum 0.200-0.220 x 0.088-0.110 mm. The rostellum is armed with 10 hooks which are 0.036 mm long. The neck is 0.960-1.6 mm long. The cirrus-sac in the sexually mature segments attains a size of 0.360-0.472 x 0.076-0.102 mm. The inner seminal sac is present, the outer seminal sac measures 0.190-0.320 by 0.070-0.094 mm. The cirrus measures 0.124-0.128 x 0.046 to 0.048 mm its end is covered with minute spines. The testes are spherical, placed slightly asymmetrically from the median line of the segment in poral direction, their diameter is 0.090-0.142 mm. The vagina opens in to a small genital atrium under the opening of the cirrus-sac. Firstly it is orientated parallelly with the cirrus-sac, then it turns to the posterior edge of the segment. There it widens in a seminal receptacle. The fan-shaped ovary is composed of numerous small follicles and lies moderately aporally from the median line of the segment. It has a diameter of 0.390 to 0.600 mm. Beneath it lies the elongate lobate vitelline gland, which measures 0.200-0.310 x 0.080 mm. In older segments containing a developed uterus, the vitelline gland is oval and compact measuring 0.100-0.240 x 0.100 mm. The uterus, at first a transverse tube running through the middle of the segment, later occupies almost the complete space of the segment. The ventral excretory canals

have a diameter of 0.032 mm, the dorsal 0.008 mm. No mature eggs were found in our specimens.

12. *Flamingolepis megalorchis* (Lühe, 1898)

Host: *Phoenicopterus ruber ruber* Linnaeus

Location: intestine

Locality: Playa Larga - Ciénaga de Zapata, province Las Villas, Cuba

Nineteen specimens of this cestode species were found in a single *Phoenicopterus ruber ruber*. We are not adding a description of these cestodes because this was given by Vigueras (1941) from the same host in Cuba. Our specimens are in complete morphological accord with those described by Vigueras.

13. *Hymenosphenacanthus caroli* (Parona, 1887)

Host: *Phoenicopterus ruber ruber* Linnaeus

Location: intestine

Locality: Playa Larga - Ciénaga de Zapata, province Las Villas, Cuba

We recovered 12 specimens of this cestode species from a single flamenco. Because also this species was described in detail by Vigueras (1941) from the same host we are not describing it.

14. *Lobatolepis lobulata* (Mayhew, 1925) Yamaguti 1959. Fig. 16

Syn.: *Hymenolepis lobulata* Mayhew, 1925

Hosts: *Podilymbus podiceps podiceps* Linnaeus; *Butorides virescens maculatus* Boddaert

Location: intestine

Localities: Península Zapata, Jardín Botánico Soledad, province Las Villas; Punta de Caguenas, province Matanzas, Cuba

Of the total of 7 *Podilymbus podiceps podiceps* examined this cestode species

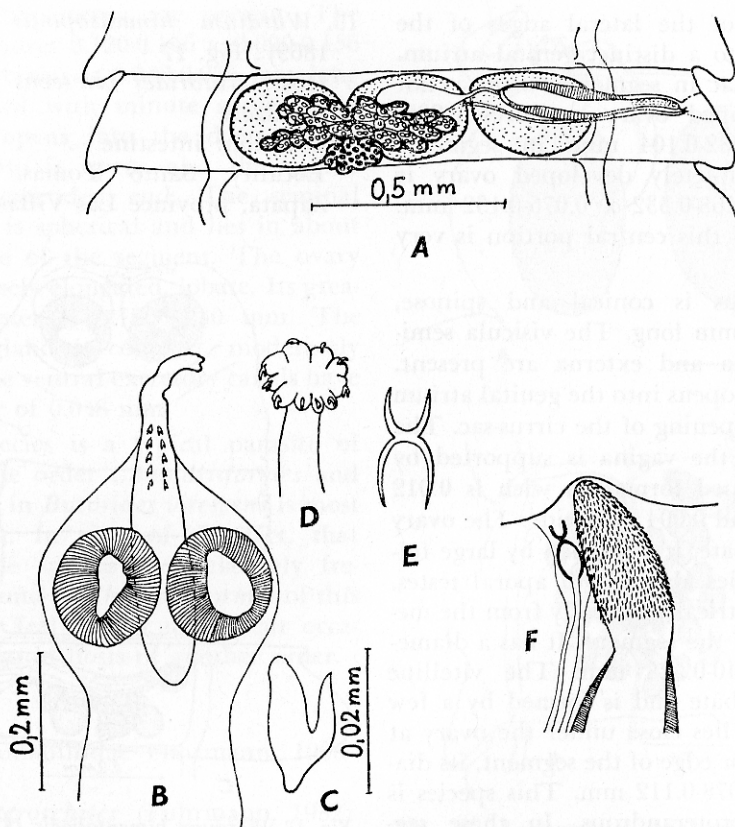


Fig. 16. *Lobatolepis lobulata* (Mayhew, 1925). A - sexually mature segment, B - scolex, C - rostellar hook, D - expanded part of rostellum, E - vagina support, F - cirrus and opening of vagina.

was found in 4 specimens (1-7 worms). In one specimen of *Butorides virescens maculatus* from the Jardín Botánico in Soledad we found 9 young worms. According to the morphology of the scolex and the hooks this species was identified as *L. lobulata*. The cestodes are 87-122 mm long, maximum width 2-2.6 mm. The conical scolex measures 0.406-0.448 mm in diameter. The spherical till moderately oval suckers measure 0.146-0.204 mm in greatest diameter and are bare, without spines. The rostellum attains a length of 0.210-0.270 mm, a width of 0.024 mm. When protruded a lobate rosette is formed on its peak and each lobe of this rosette bears one rostellar

hook. The diameter of this extended peak is 0.078-0.092 mm. The rostellar sheath is distinctly visible and reaches the scolex base. It is 0.128 to 0.172 mm long and 0.032-0.044 mm wide. The rostellar hooks (10) are arranged in a single row, their length is 0.018-0.022 mm.

The hermaphroditic segments contain 3 testes lying in a single row near the upper edge of the segment. The testes are spherical till oval in younger segments; sometimes, in segments with a completely developed ovary they are even lobate. Their size is 0.168-0.256 x 0.140-0.186 mm. The genital pores are unilateral and open at a little distance above

the center of the lateral adges of the segments into a distinct genital atrium. The cirrus-sac in segments with a not fully developed ovary measures $0.200-0.286 \times 0.082-0.104$ mm; in segments with a completely developed ovary it measures $0.468-0.532 \times 0.076-0.132$ mm. The wall of this central portion is very muscular.

The cirrus is conical and spinose, $0.148-0.172$ mm long. The visicula seminalis interna and externa are present. The vagina opens into the genital atrium under the opening of the cirrus-sac. The opening of the vagina is supported by an "X"-shaped formation wich is 0.012 mm long and 0.004 mm wide. The ovary is much lobate, it is formed by large follicles and lies above both aporal testes, i.e. asymmetrically aporally from the median line of the segment. It has a diameter of $0.440-0.528$ mm. The vitelline gland is lobate and is formed by a few follicles. It lies close under the ovary at the posterior edge of the segment, its diameter is $0.078-0.112$ mm. This species is distinctly proterandrous. In these segments with clearly visible testes the ovary and the vitelline gland form only minute rudiments. In segments with developed female genital glands the testes are indistinct or their outlines disappear. The uterus develops from the transversely tubular anlage; later it widens and becomes lobate. In these segments the strongly developed seminal receptacle is well-visible. The eggs are spherical, their diameter is $0.136-0.196$ mm.

The scolex of this species resembles in shape, size and structure mainly that of the species *Laterorchites bilateralis* Fuhrmann, 1908. Also the number of rostellar hooks is the same and their shape is almost identical. A most reliable differentiating sign are the suckers which in *Laterorchites bilateralis* Fuhrmann, 1908 are spinose, but bare in *Lobulatolepis lobulata* (Mayhew, 1925).

15. *Wardium himantopodis* (Krabbe, 1869). Fig. 17

Host: *Butorides virescens maculatus* Boddaert

Location: intestine

Locality: Santo Tomás, península Zapata, province Las Villas, Cuba

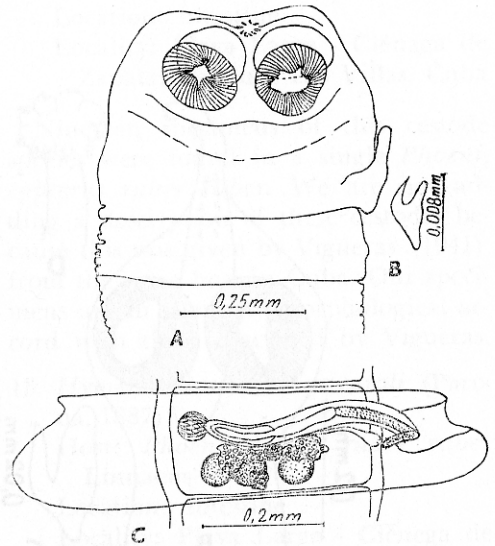


Fig. 17. *Wardium himantopodis* (Krabbe, 1869). A - scolex, B - rostellar hook, C - sexually mature segment.

We found only a solitary specimen without gravid segments in *Butorides virescens maculatus*. The cestode is 64 mm long, maximum width 0.780 mm. The spherical scolex measure 0.516 mm, the circular suckers $0.140-0.148$ mm in diameter. The rostellum has a diameter of 0.024 mm and bear 10 hooks of $0.007-0.008$ mm in length, arranged in a single row.

The hermaphroditic segments contain 3 testes placed in a row at the posterior edge of the segment. Their diameter is $0.086-0.098$ mm. The cirrus-sac is $0.336-0.372$ mm long and $0.044-0.048$ mm wide and reaches the center of the segment without extending beyond the aporal excretory canals. The vesicula seminalis

interna and externa are present. The latter measures $0.120-0.146 \times 0.090-0.136$ mm. The cirrus is $0.048-0.056$ mm long and covered with minute spines. The cirrus-sac opens into the deep genital atrium, into it opens also the vagina with its extended end. The seminal receptacle is spherical and lies in about the middle of the segment. The ovary is transversely elongated, lobate. Its greatest diameter is $0.180-0.230$ mm. The vitelline gland is compact, moderately lobate. The ventral excretory canals have a diameter of 0.048 mm.

This species is a typical parasite of hosts of the order *Charadriiformes* and its finding in *Butorides virescens* is most uncommon. In view of the fact, that this cestode species was relatively frequently found in *Charadriiformes* of this region, we feel that it may occur occasionally also in hosts of another order.

Family Amabiliidae Fuhrmann, 1908

Genus *Laterorchites* (Fuhrmann, 1932)
emend.

16. *Laterorchites bilateralis* Fuhrmann, 1908. Figs. 18, 19

Syn.: *Choanotaenia bilateralis* Fuhrmann, 1908

Host: *Podiceps dominicus dominicus* Linnaeus

Location: intestine

Locality: Laguna Jagüey - La Gloria, Guanahacabibes, province Pinar del Río, Cuba

These cestodes were found in 3 out of the 4 hosts examined; their incidence was 1-8 specimens per host.

The cestode measures 8.5-19 mm in length, maximum width $0.460-0.848$ mm. The body of most specimens widens from the scolex down wards but the body of several of the worms (Fig. 19b),

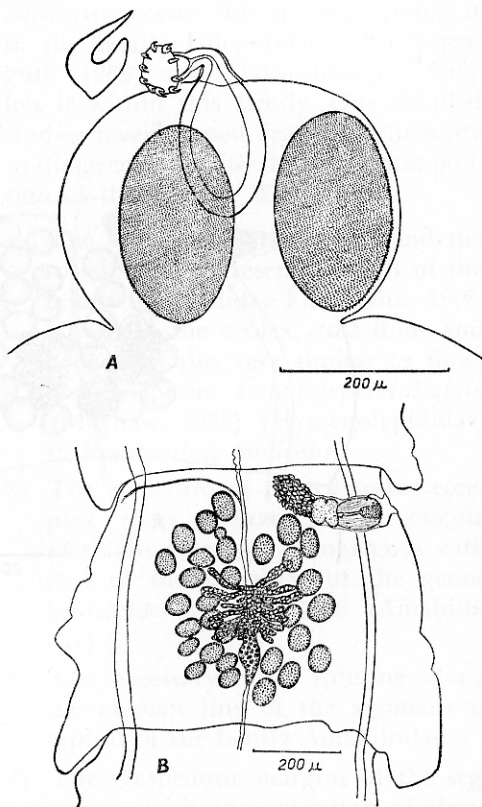


Fig. 18. *Laterorchites bilateralis* Fuhrmann, 1908. A - scolex, B - sexually mature segment.

which at first widened normally, suddenly started to attenuate. In these specimens the segments are acraspedotic while the normal specimens are always distinctly craspedotic. Apart from these differences the other basic criteria are analogous in both types. It seems probable that these are teratological specimens.

The spherical scolex has a diameter of $0.368-0.530$ mm, the oval suckers measure $0.206-0.312 \times 0.132-0.178$ mm. They are completely covered with minute fine spines even in the center. The rostellum when expanded is $0.142-0.184$ mm long, its width 0.020 to 0.025 mm. Its peak is disk-like extended and measures 0.078 mm in width. This extended rostellar disk bears 10 hooks in a single

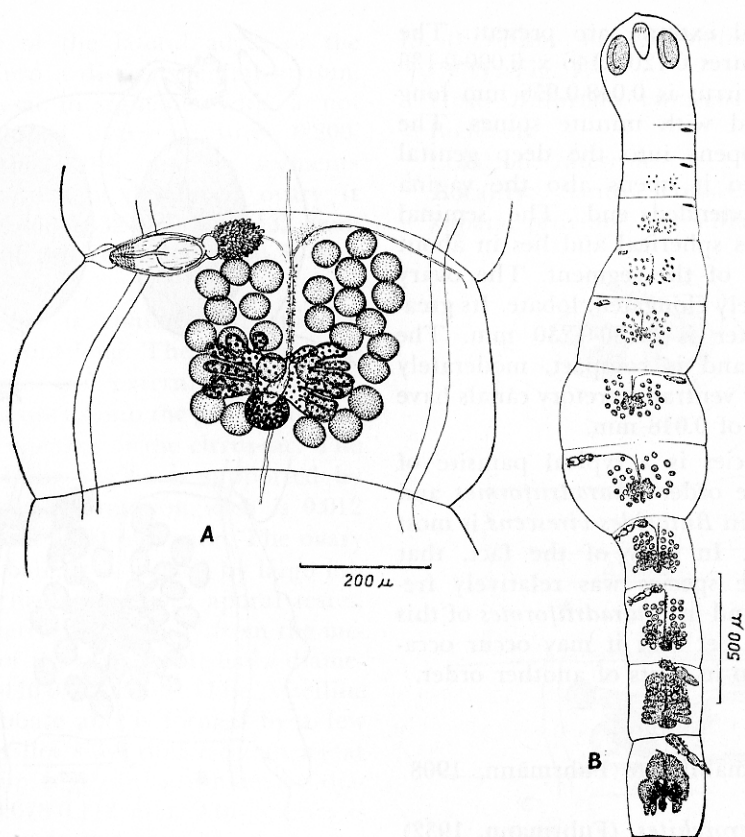


Fig. 19. *Laterorchites bilateralis* Fuhrmann, 1908. A - acraspedote segment, B - acraspedote strobilum.

row, which are 0.018-0.021 mm long. The rostellum is enclosed in an oval or ovoid rostellar sheath (0.140-0.172 x 0.068-0.088 mm). The scolex is joined to the strobila by an attenuated neck which is 0.090-0.134 mm long.

In hermaphroditic segments the diameter of the ventral excretory canals is 0.008-0.011 mm. The genital pores are irregularly alternate and open in the upper half of the segment length close under the posterior edge of the preceding segment. They start to occur in the first young segments under the scolex. The number of testes in the segments is 26-36, most frequently 32-33. They are placed in the middle of the segment and sur-

round the ovary and the vitelline gland from all sides.

They are spherical or oval and their diameter is 0.024-0.036 mm. The cirrus-sac measure 0.060-0.110 x 0.028 to 0.064 mm. The fully expanded cirrus is 0.097-0.128 mm long. The bulbus cirri has a diameter of 0.029-0.032 mm, distally from the bulbus cirri the diameter of the cirrus is 0.011-0.014 mm. It is covered with fine spines which are thickest on its extended base (bulbus cirri), distally they reduce in numbers until, finally, they disappear leaving the end of the cirrus bare. An organ situated proximally of the bulbus cirri seems to be identical with the pars prostatica of *Schistotaenia scolopendra*

Diesing, 1850 (see Baer 1940). This organ measure 0.048-0.060 x 0.48-0.088 mm in our specimens. The developed hermaphroditic segments contain a vesicula seminalis externa, which is completely surrounded by oval or conical cells resembling gland cells. Similar cells are described by Yamaguti (1940) from *Tatria acanthorhyncha* (Wedl, 1855) Kowalewski, 1904. In older segments the number of these cells reduces. The vesicula seminalis externa measure 0.092-0.168 x 0.040-0.80 mm. The structure of the whole complex of the cirrus-sac is very similar to that of the members of the family Amabiliidae. The whole complex lies in a muscular sac. The ovary is branched and lies in the center of the segment. Its greatest diameter is 0.108 to 0.260 mm. The compact vitelline gland is subspherical or oval and lies under the ovary; it measures 0.068 to 0.072 x 0.092-0.112 mm. The vagina extends in caudo-cranial direction through the center of the segment and then turns in aporal direction to the cranial end of the segment. Its opening becomes indistinct in front of the lateral edge of the segment. The developing uterus is horseshoe-shaped and of lobate structure. The eggs are oval; no structural details could be detected in the whole mounts. The embryonic hooks measure 0.009-0.010 mm.

In addition to the two pairs of excretory canal there is a 3rd accessory canal running through the median line of the segment. In several more mature segment, in the region of the vitelline gland we found an oval till spherical aperture its edges covered with spines.

The species *Laterorchites bilateralis* Fuhrmann, 1908 has been placed hitherto to the family Dilepididae Fuhrmann, 1907. Fuhrmann placed it in his original description to the genus *Choanotaenia* Railliet, 1896. In 1932, Fuhrmann erected the independent genus *Lateror-*

chites to receive this species, leaving it in the family Dilepididae. Also Yamaguti (1959) and Mathevossian (1963) left it within this family. Our detailed studies revealed new features, which are in disagreement with the systematic position of this species. These are:

- 1) The structure of the scolex and the rostellar hooks resembles that of the family Amabiliidae Fuhrmann, 1908. However, the scolex, rostellum and hooks are also very similar to those of the species *Lobatolepis lobulata* (Mayhew, 1925) (Hymenolepididae) in *Podilymbus podiceps*.
- 2) The structure of the cirrus-sac complex (pars prostatica and vesicula seminalis externa) is analogous with that of the members of the genus *Schistotaenia* Cohn, 1900 (Amabiliidae).
- 3) The accessory canal running along the median line of the segments is typical of the family Amabiliidae.
- 4) The craspedotic margins of the segments (with the exception of those mentioned in the foregoing text) are typical of the family Amabiliidae although the lateral marginal extensions are not so strongly developed as for instance in the genus *Tatria* Kowalewski, 1904 or in *Schistotaenia* Cohn, 1900.

On the grounds of these signs we believe that the genus *Laterorchites* Fuhrmann, 1932 belongs to the family Amabiliidae with the following generic diagnosis:

Amabiliidae. Scolex with a single row of rostellar hooks. Sucker spinose. Testes numerous, surrounding the female genital organs. Cirrus-sac, pars prostatica and vesicula seminalis externa form a complex and are covered with one muscular sac. Ovary branchlike lobed. Accessory canal running along the median line of the segment. Uterus sacciform.

17. *Schistotaenia scolopendra* (Diesing, 1856). Fig. 20

Host: *Podiceps dominicus* Linnaeus

Location: intestine

Localities: Guanahacabibes-Province
Pinar del Río; Playa Larga, province
Las Villas, Cuba

Of the 7 *Podiceps dominicus* examined
4 were found invaded by this helminth

conical spines of 0.008-0.011 mm in length.

The genital pores alternate irregularly in the segments. Hermaphroditic segments contain 20-37 spherical testes measuring 0.036-0.048 mm in diameter. The testes are placed in the lower half of the segments at both sides of the vitelline gland, which is lobate and measures 0.084-0.112 mm in diameter. The ovary is

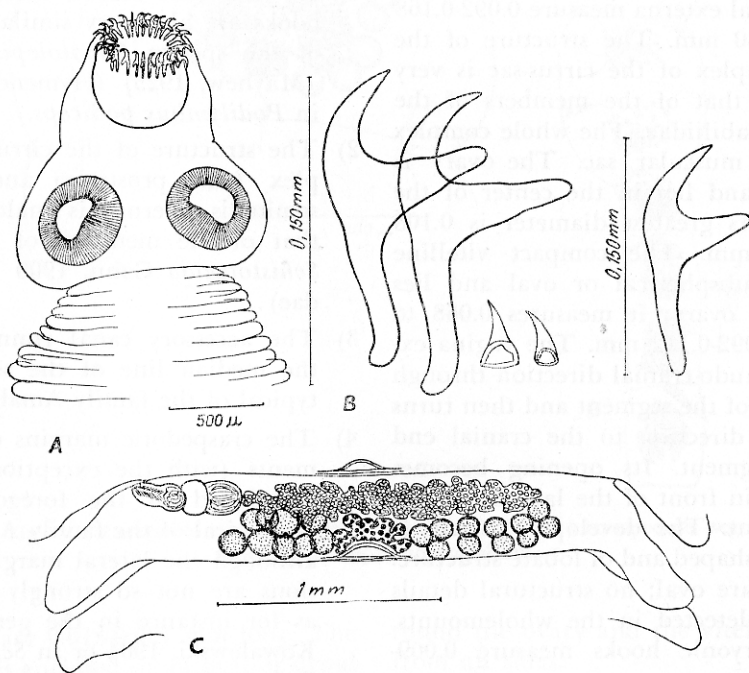


Fig. 20. *Schistotaenia scolopendra* (Diesing, 1856). A - scolex, B - rostellar hooks and spines from the surface of the rostellum, C - hermaphroditic segment.

species. The wormload was 3-16 specimens. The cestode is 11.8-21.5 mm long, maximum width 2.8-3.5 mm. The scolex is 1.017-1.123 mm in diameter, the greatest diameter of the suckers is 0.275-0.508 mm. The rostellum is 0.424-0.508 mm wide and armed with 24 hooks, length 0.140 to 0.156 mm. Their blade is 0.042-0.046 mm long, the guard 0.062-0.074 mm, the handle 0.064-0.072 mm. In addition the rostellum is covered with

transversely elongated, lobate and lies in the upper half of the segment. Its greatest diameter is 1.1-1.4 mm. A fusiform seminal receptacle with a diameter of 0.048-0.056 mm lies close under the vitelline gland. Cirrus-sac oval or pyriform, size 0.088-0.128 x 0.056 to 0.064 mm. The prostatic gland is almost spherical measuring 0.050-0.062 mm in diameter, the vesicula seminalis externa measures 0.072-0.080 x 0.048-0.064 mm. Cirrus,

0.176 to 0.202 mm long, with a distinct bulb at its base covered irregularly with large spines. No spines were found on the other parts of the cirrus.

Our specimens differ from the European forms of *Schistotaenia macrorhyncha* Wedl, 1856 mainly in the shape of the hooks, which is similar to that of the species *S. scolopendra* Diesing, 1856. Another differentiating sign is the smaller cirrus-sac. The cirrus of *S. macrorhyncha* is completely spinose while, in our material spines were found only on the bulb. Our species differs from *Schistotaenia colymba* Schell, 1955 described from *Colymbus auritus* L. in the U. S. A. (Idaho) (this host may also occur in Cuba) in the longer rostellar hooks (length of hooks of *S. colymba* 0.108 to 0.110 mm), in the smaller number of testes and in a cirrus which is longer in *S. colymba* and covered completely with spines. In view of its morphological structure we be-

lieve that our specimens belong to the species *Schistotaenia scolopendra* Diesing, 1856 and that by its geographical distribution, this species is typical for the American Continent and adjoining regions.

18. *Tatria appendiculata* Fuhrmann, 1908. Fig. 21

Host: *Podiceps dominicus dominicus* Linnaeus

Location: intestine

Locality: La Tumba — Guanahacabibes, province Pinar del Río, Cuba

Two of the 4 hosts examined were invaded by this helminth species. The wormload was 27 and 43 worms.

The cestode is 1.268-2.120 mm long. Its overall width including the lateral extension is 0.392-0.530 mm, without them 0.360 mm. The cuticle is covered

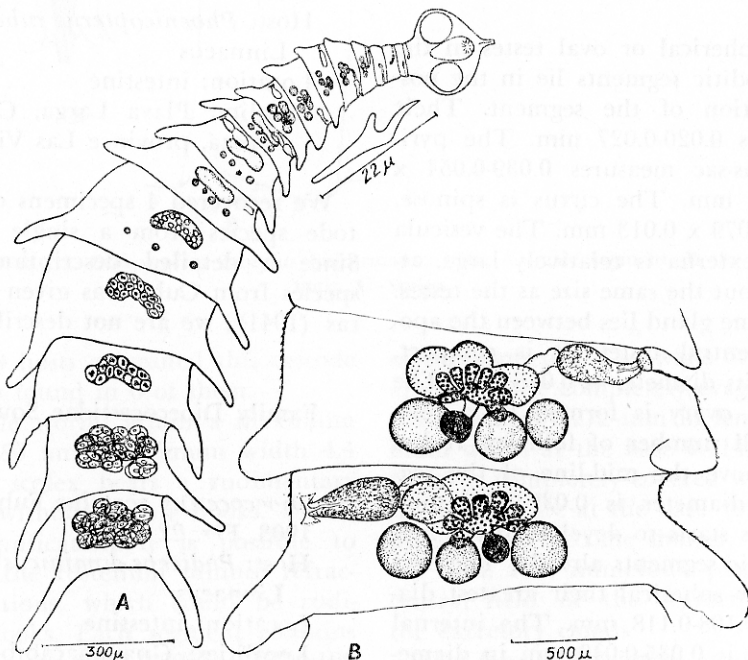


Fig. 21. *Tatria appendiculata* Fuhrmann, 1908. A-adult specimen, B-hermaphroditic segment.

with fine spines both on the scolex and on the first juvenile segments. These spines are absent at the level of the lateral extensions and, therefore, in fully developed hermaphroditic segments they cover only the anterior half of the segment. Cuticular spines are absent in older and gravid segments.

The widely conical scolex has a diameter of 0.193 to 0.237 mm (in fresh material), in permanent mounts up to 0.308 mm. The suckers are spherical or oval, their greatest diameter is 0.088-0.114 mm.

The diameter of the rostellum is 0.061-0.075 mm. It bears 10 hooks, length 0.022-0.024 mm, length of the root 0.015-0.016 mm, of the blade 0.010 mm.

The strobila consists of 14-19 segments which have lateral extensions orientated to the posterior end of the strobile. Their length is 0.176-0.220 mm. The genital pores are regularly alternate and lie in the anterior portion of the segment.

Three spherical or oval testes in the hermaphroditic segments lie in the posterior portion of the segment. Their diameter is 0.020-0.027 mm. The pyriform cirrus-sac measures 0.039-0.054 x 0.020-0.028 mm. The cirrus is spinose, big, size 0.079 x 0.013 mm. The vesicula seminalis externa is relatively large, attaining about the same size as the testes. The vitelline gland lies between the aporal and central testes. It is compact, spherical, its diameter is 0.015 mm. The fan-shaped ovary is formed by a relatively small number of follicles. It lies slightly above the mid-line of the segment, its diameter is 0.039-0.058 mm. The uterus starts to develop in the hermaphroditic segments already. The eggs are oval or spherical their greatest diameter is 0.108-0.118 mm. The internal membrane is 0.035-0.040 mm in diameter, the embryonic hooks are 0.01 mm long.

Our species differs slightly in the shape of the hooks from those of Fuhrmann's original description (from the same host); the blade of the hook in our species is bent moderately to the dorsal side, while Fuhrmann figured it as bent ventrally. The shape of the hooks resembles slightly that of *Tatria biremis* Kowalewski, 1904 or of *Tatria duodecacanthal* Olsen, 1939. In *Tatria biremis*, however, which has the same number of hooks as our species (10), these are twice as long; the rostellar hooks in *Tatria duodecacanthal* number 12, while none of our specimens has more than 10 hooks. In addition the species *Tatria duodecacanthal* has 6-9 testes, our species only 3. All other features in our material are very similar to those of *Tatria appendiculata* Fuhrmann, 1908 and, therefore, we have placed it to this species.

19. *Leptotaenia ischnorhyncha* (Lühe, 1898)

Host: *Phoenicopterus ruber ruber*
Linnaeus

Location: intestine

Locality: Playa Larga, Ciénaga de Zapata, province Las Villas, Cuba

We recovered 4 specimens of this cestode species from a single flamenco. Since a detailed description of this species from Cuba was given by Viguera (1941), we are not describing it.

Family Dioecocestidae Southwell,
1930

20. *Dioecocestus acotylus* Fuhrmann, 1903. Fig. 22

Host: *Podiceps dominicus dominicus*
Linnaeus

Location: intestine

Localities: Guanahacabibes, province Pinar del Río; Península Zapata, province Las Villas, Cuba

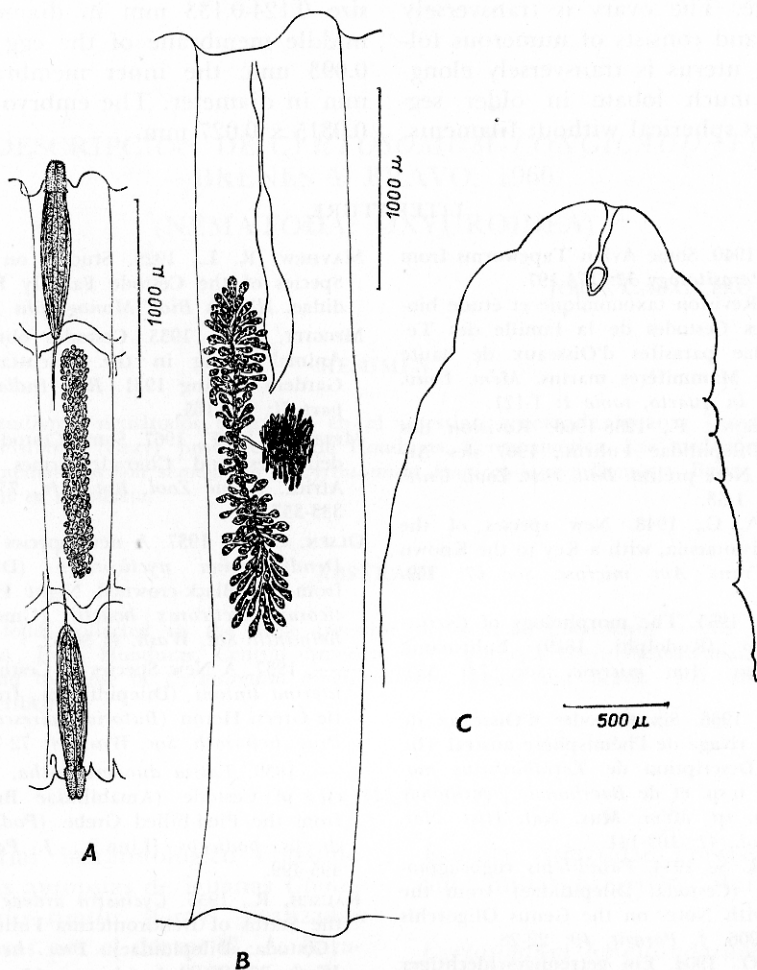


Fig. 22. *Dioecocestus acotylus* Fuhhrmann, 1904. A - male segment, B - female, C - scolex.

Of the 9 hosts examined this cestode species was found in 6 of them.

The male worms attain a maximum length of 56 mm, maximum width 4.4 mm. The scolex bears a rudimentary rostellum without visible hooks. Under great magnification it is possible to detect on the rostellum minute refractile formations, which could be rudimentary hooks. Each segment contains 2 cirrus-sacs, size 0.534-0.996 x 0.167-0.193 mm. The opening of these cirrus-sacs lies in the center of the lateral margins

of the segments. The walls of these sacs are thick, the completely evaginated cirrus measures 0.272 mm in length, maximum width at the base 0.114 mm. The cirrus is completely covered with spines, the longest are at the base (0.009 mm), distally they become shorter. The testes are oval, very numerous, placed in the central field of the segment between the excretory canals.

The female specimens attain a maximum length of 21 cm, maximum width 5 mm. Their genital pores are irregular-

ly alternate. The ovary is transversely elongated and consists of numerous follicles. The uterus is transversely elongated and much lobate in older segments. Eggs spherical without filaments,

size 0.124-0.133 mm in diameter. The middle membrane of the egg measures 0.093 mm, the inner membrane 0.036 mm in diameter. The embryo measures 0.0315 x 0.027 mm.

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