

- REEVE, L. 1855. Monograph of the genus *Nerita*. *Conchologia Iconica*, 9, pls. 1-9.
- SATYAMURTI, S. T. 1952. The Mollusca of Krusadai Island (in the Gulf of Mannar) 1. Amphineura and Gastropoda. *Bull. Madras Govt. Mus., N. S. Nat. Hist. Sec. 1 (2)*, pt. 6 : 1-266, pls. 1-33.
- TRYON, G. W. 1888. Monograph of the family Neritidae. *Man. Conch.*, 10 : 3-11, 18-82, pls. 1-29.

# DIGENETIC TREMATODES OF MARINE FISHES OF ANDAMAN

By

M. HAFEEZULLAH AND I. B. DUTTA  
*Zoological Survey of India, Calcutta*

(With 3 Text-figures)

## INTRODUCTION

The digenetic trematode fauna of marine fishes of Andaman and Nicobar Islands has been negligibly explored and studied. The same is true with other helminth groups also. Soota *et al.* (1970), and Gupta and Miglani (1974) have described some digenetic trematodes of marine fishes from these groups of islands. The small number of specimens which forms the basis of the present study were collected by Dr. A. K. Mandal and Party in July, 1972. Unfortunately the host fishes were not identified. All the drawings have been made with the aid of a camera lucida. The measurements have been given in microns unless otherwise stated.

## SYSTEMATIC ACCOUNT

### Family HEMIURIDAE

#### 1. *Hysterolecithoides frontilatus* (Manter, 1969)

(Text-fig. 1)

1969. *Theletrum frontilatum* Manter, *Proc. helminth. Soc. Wash.*, 36 (2) : 194-204.

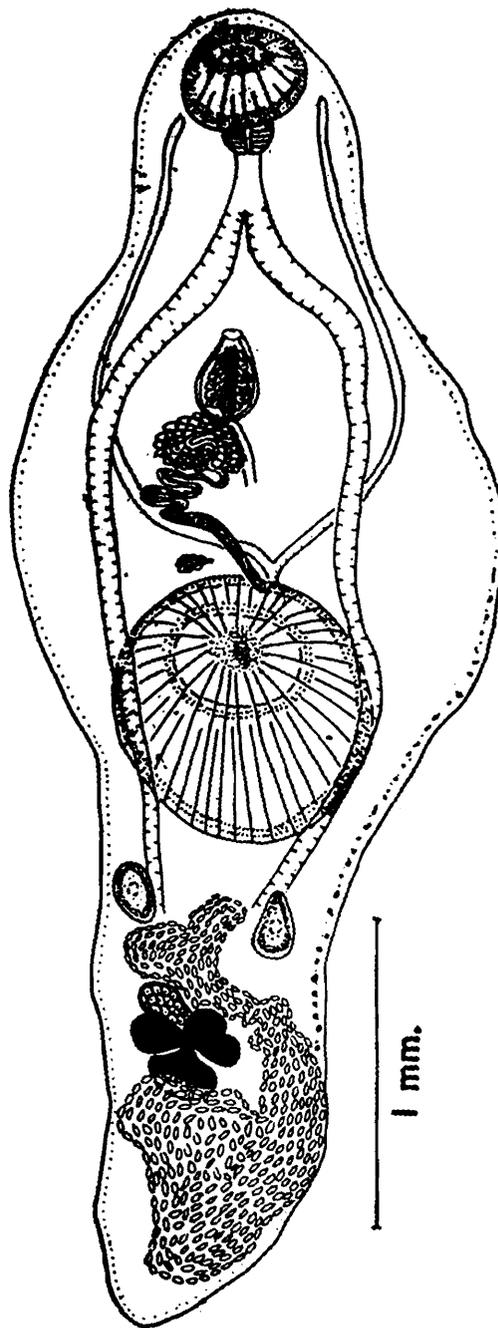
1971. *Hysterolecithoides frontilatus* Yamaguti, *Synog. Dig. Trem. Verteb.*, I. p. 303.

*Material*.—4 ex., host—unidentified marine fish, location—stomach, locality—Chiria Tapu (Andaman), specimens—Z. S. I. Reg. Nos. W7272/1 to W7274/1.

*Description*.—Body 4.211-6.077 mm long, 1.278-1.938 mm wide, wider in the preace—tabular region, hindbody tapering posteriorly. Acetabulum 825-1, 045 long, 728-866 wide, at 1.444 to 2.15 mm from anterior end of body. Oral sucker 357-440 long, 343-398 wide. Suckers' width ratio 1 : 1.8—2.28 taking width of oral sucker as one. Prepharynx absent pharynx 114-171 in diameter; oesophagus short, followed by cecal bifurcation; ceca simple reaching posterior end of body.

Testes two, ovoid, right testis 192-275 long, 137-165 wide; left

testis 178-247 long, 96-165 wide, symmetrical, immediately behind acetabulum. Seminal vesicle tubular, long, coiled, posteriorly reaching or slightly overlapping acetabulum. Pars prostatica wide, long, winding, surrounded by well developed prostate cells throughout. Sinus sac muscular pear-shaped, enclosing straight tube of genital sinus or hermaphroditic duct, and filled with gland cells between wall of sinus sac and genital sinus. Genital pore median, much behind cecal bifurcation midway between the two suckers. Genital atrium short.



Text-fig. 1. *Hysterolecithoides frontilatus* (Manter, 1969) Yamaguti, 1971. Dorsal View.

Ovary 165-233 long, 137-151 wide, longer than wide, posttesticular, separated from testes by coils of uterus, adjacent to vitelline lobes. Vitelline lobes three, in some specimens left lobe may be slightly indented, situated between posterior end of body and acetabulum. Uterus much coiled, descending upto in front of posterior end of body, largely postacetabular. Eggs minute, 21-28 by 10-14.

Excretory pore terminal. Excretory vesicle I-shaped, dividing into two near anterior border of acetabulum, branches running side ways, not uniting behind oral sucker.

*Remarks.*—Manter (1969) described his specimens from *Siganus rivulatus* (Forsk.) as *Theletrum frontilatum* whereas Yamaguti (1971) considered Manter's species in the genus *Hysterolecithoides* Yamaguti, 1934. According to Yamaguti (1971 : p. 303) *Theletrum* Linton, 1910 has postacetabular circular ridge, positions of acetabulum and female gonads are different, and the excretory crura unite dorsal to oral sucker or pharynx. In *Hysterolecithoides* Yamaguti, 1934 the postacetabular circular ridge is absent, the acetabulum is more posterior in position, female gonads are removed anteriorly from posterior end of body, and the excretory arms do not unite dorsal to oral sucker or pharynx. This combination of characters indicates that our specimens should belong to *Hysterolecithoides* rather than *Theletrum*. The only difference is that other species of *Hysterolecithoides* have seven vitelline lobes whereas in the present specimens there are three. As a matter of fact the difference in the number of vitelline lobes is of great taxonomic importance but in view of other strong similarities, Yamaguti's placement of Manter's species in the genus *Hysterolecithoides* seems to be correct.

We have collected specimens also from the marine fish *Siganus oramin* from the Gulf of Mannar as well as Coromandel Coast.

#### Family OPECOELIDAE

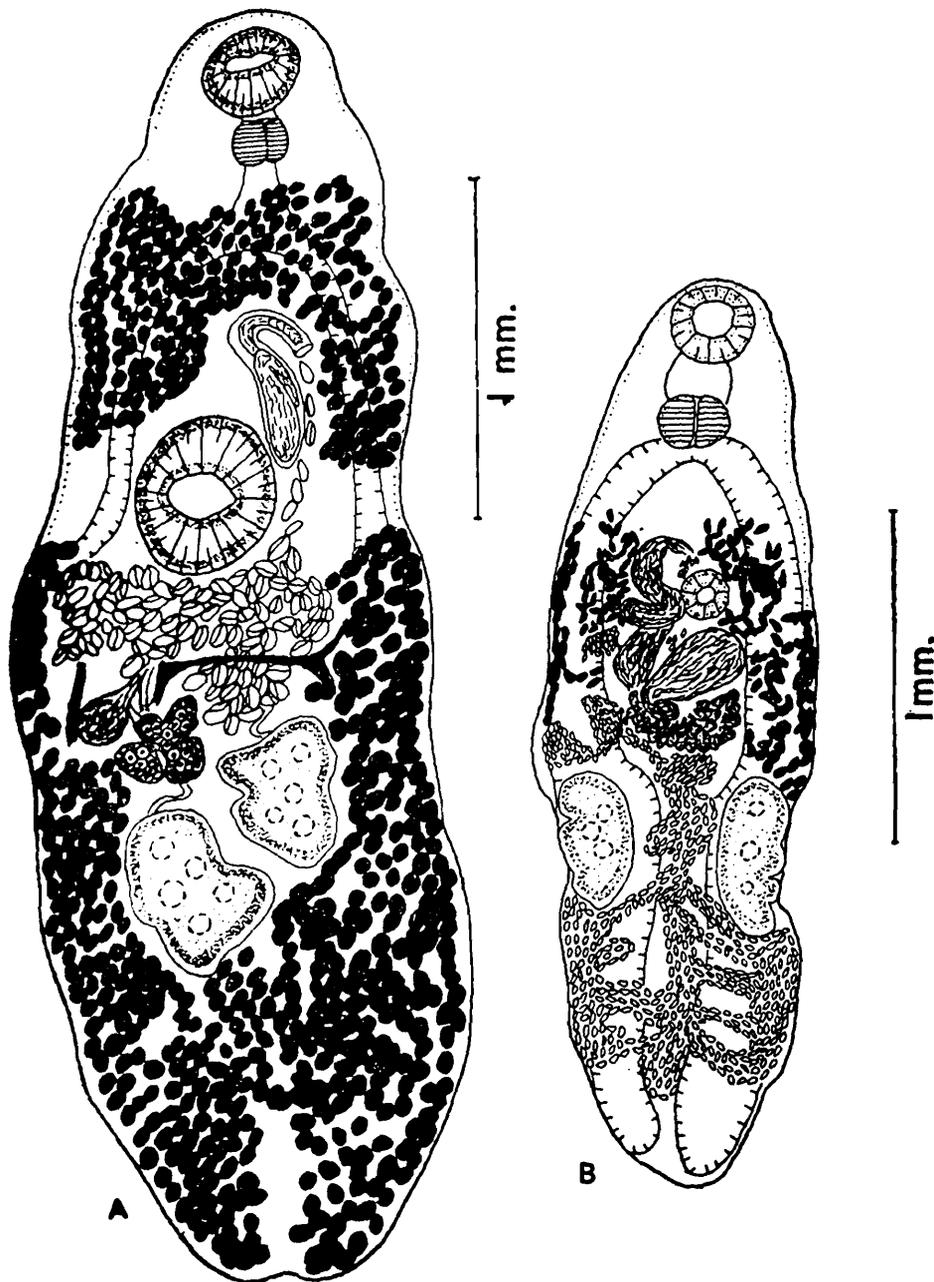
#### 2. *Hamacreadium interruptus* Nagaty, 1941

(Text-fig. 2A)

1941. *Hamacreadium interruptus* Nagaty, *J. Roy. Egypt. Med. Assoc.* **24** : 300-310.
1952. *Plagioporus (Plagioporus) longivesicula* Yamaguti, *Acta Med. Okayama* **8** : 146-198.
1962. *Hamacreadium lethrini* Nagaty and Abdel Aal, *J. Parasit.* **48** : 384-386.
1962. *Hamacreadium nagatyi* Lamothe, *An. Inst. Biol. Mexico.* **33** : 97-111.
1963. *Hamacreadium lenthrium* Manter, *J. Parasit.* **49** : 99-113.

*Material.*—1 ex., host-unidentified marine fish, location—intestine, locality—Chiria Tapu (Andaman), specimen—Z.S.I. Reg. No. W7275/1.

*Description.*—Body 3.781 mm long, 1.141 mm. wide. Cuticle unarmed. Non-occulate. Forebody 1.152 mm. Acetabulum cup-shaped, 454 long, 413 wide, preequatorial. Oral sucker 220 long, 261 wide, spherical ventroterminal smaller than acetabulum. Sucker's width ratio 1 : 1.5 taking width of oral sucker as one ; suckers' length ratio 1 : 2.05 taking length of oral sucker as one. Prepharynx short ; pharynx 124 long, 138 wide ; oesophagus present ; ceca reaching posterior end of body.



Text-fig. 2 A—*Hamacreadium interruptus* Nagaty, 1941. Ventral View ;  
B—*Mehracola ovocaudatum* Srivastava, 1937. Ventral View.

Testes two, diagonal, margin indented, 447-516 long 327-404 wide, postequatorial. Cirrus sac club-shaped, lying vertically on left side between acetabulum and left cecum, anterior narrower part recurved,

opening inward of left cecum (probably the original diagonal disposition of cirrus sac from right border of acetabulum to genital pore on left side has been disturbed during processing), enclosing seminal vesicle having one loop, pars prostatica surrounded by prostate cells, and ejaculatory duct.

Ovary 4—lobed, between anterior testis and uterus, submedian or right, Seminal receptacle flask-shaped, dorsodextral to ovary. Vitelline follicles interrupted at acetabular level on both sides. Coils of uterus between acetabulum anteriorly, and anterior testis and ovary posteriorly. Metraterm indiscernible. Eggs 70-74 x 35-49.

Excretory vesicle undetermined. Excretory pore terminal.

*Remarks.*—*Hamacreadium* Linton, 1910 is sometimes confused with *Plagioporus* Stafford, 1904 and *Podocotyle* (Dujardin, 1845) because of great anatomical similarities among themselves. However, according to Manter (1947), *Hamacreadium* is distinguished from *Plagioporus* "by diagonal testes together with a lobed ovary. In species of *Plagioporus* with a lobed ovary, the testes are tandem. Again, "*Hamacreadium* seems to differ from *Podocotyle* chiefly in that the testes are diagonal rather than tandem".

The present specimens appears to be *Hamacreadium interruptus* Nagaty, 1941 by all probabilities. We concur with Fischthal and Kuntz (1965) for synonymising *Plagioporus* (*Plagioporus*) *longivesicula* Yamaguti, 1952 to *Hamacreadium interruptus*.

The type and paratype specimens of *Maculifer spiralis* Soota, Srivastava, C. B. and Ghosh, 1969 have been examined. Postoral muscular collar, characteristic of the family Opistholebetidae, is not present in these specimens. Apparently its authors mistook the contracted prepharynx as a collar. These specimens definitely belong to the genus *Hamacreadium* of the family Opecoelidae and not to *Maculifer* of the family Opistholebetidae. They seem to be the young adults of *H. mutabile* Linton, 1910.

#### Family CRYPTOGONIMIDAE

### 3. *Mehracola ovocaudatum* Srivastava, 1937

(Text-fig. 2B)

1937. *Mehracola ovocaudatum* Srivastava, *Proc. 24th Indian Sci. Cong.*, p. 401.

1939. *Mehrailla ovocaudatum* Srivastava, *Indian J. vet. Sc. & Anim. Husb.* 9 : 209-212.

1971. *Mehracola ovocaudatum* : Yamaguti, *Synop. Dig. Trem. Vereb.*, p. 237.

*Material.*—3 ex., host—unidentified fish, location—intestine,

locality—Wright Myo (Andaman) specimens—Z.S.I. Reg. Nos. W7276/1 to W7278/1.

*Remarks.*—*Mehracola* is so far a monotypic genus reported from India only. This is the second record of the genus from the Indian region, of course, this time from the Bay of Bengal rather than the Arabian Sea.

#### Family BIVESICULIDAE

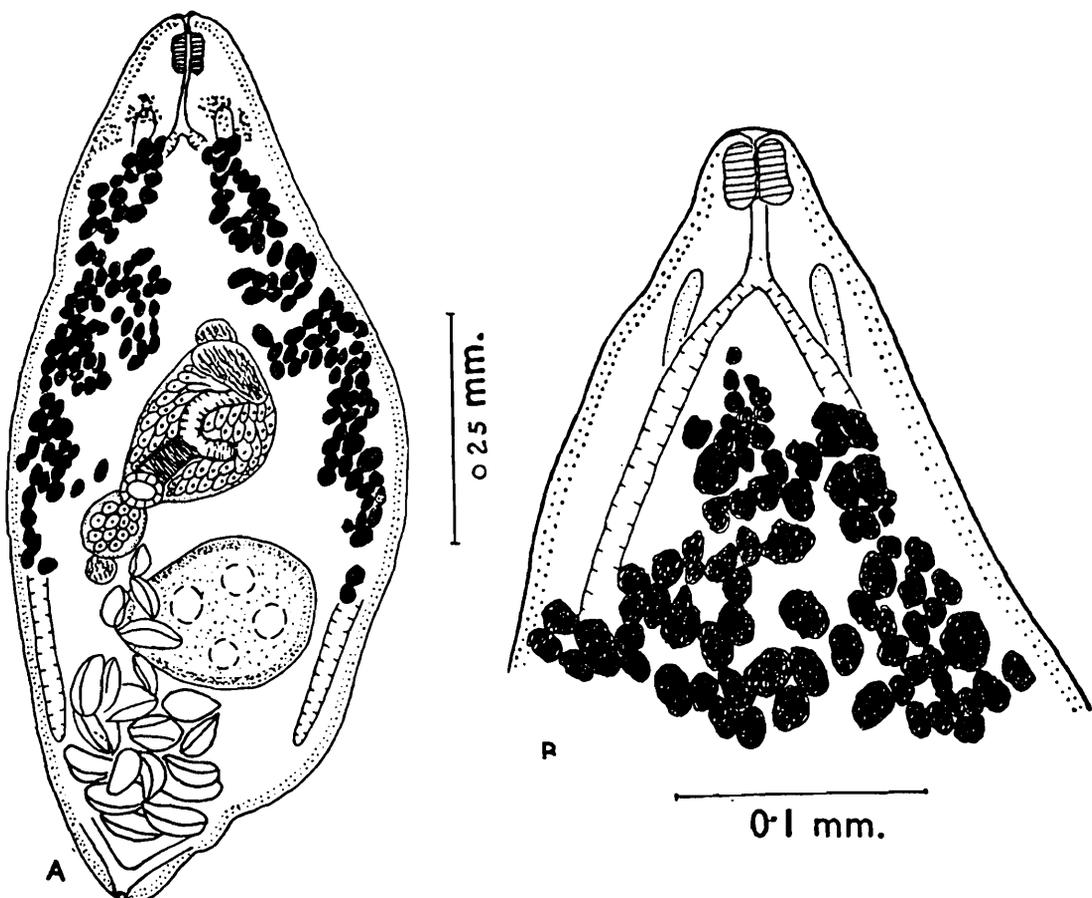
#### 4. *Bivesicula australis* Crowcroft, 1947

(Text-fig. 3)

1947. *Bivesicula australis* Crowcroft, *Pap. Proc. R. Soc. Tasmania*, 5-25, Figs. 13 & 14.

1970. *Bivesicula congeri* Yamaguti, *Dig. Trem. Hawaiian Fishes*, p. 87, fig. 121.

*Material.*—8 ex. (in addition to the broken ones), host—unidentified marine fish, location—intestine, locality—Chiria Tapu (Andaman), specimens—Z. S. I. Reg. Nos. W7279/1 to W7280/1.



Text-fig. 3. *Bivesicula australis* Crowcroft, 1947; A—Ventral View, B—Anterior part of another specimen.

**Description.**—(With measurement on 3 specimens): Body 0.99-1.072 mm long, 0.385-0.453 mm wide, fusiform when fully relaxed. Cuticle smooth, probably fine spines lost during processing. Eye-spot pigment present, dissociated. Acetabulum absent. Oral sucker 35-42 in diameter, squarish, width smaller than that of anterior end of body, sometimes withdrawn inside body. Oesophagus of medium length. Muscular oesophageal swelling in front of cecal bifurcation absent. Ceca simple, reaching middle of space between testis and posterior end of body.

Testis single, 165-228 in diameter, postequatorial. External seminal vesicle attached to anterior end of cirrus sac. Cirrus sac 190-210 long, 171-180 wide, enclosing internal seminal vesicle, thick-walled pars prostatica and highly muscular cirrus. Well developed prostate cells completely filling cirrus sac. Genital atrium shallow. Genital pore equatorial or postequatorial.

Ovary 68-82 in diameter, lying near genital pore, submedian. Vitellaria consisting of vitelline follicles extending between oesophageal level to level of anterior margin of testis, tending to coalesce mesially. Uterus descending far beyond posterior to testis, then ascending. Eggs collapsed, 70-87 by 42-45.

Excretory vesicle V-shaped, arms reaching oesophageal level. Excretory pore terminal.

**Remarks.**—Leaving aside the controversy whether oral sucker is actually the sucker or pharynx, there seem to be two sets of species in the genus *Bivesicula* Yamaguti, 1934—one with muscular oesophageal swelling in front of cecal bifurcation, and the other without it. The present specimens belong to the latter category. Again, three species so far have been described in the genus *Bivesicula* Yamaguti, 1934 in which the intestinal ceca extend posterior to testis. They are *B. australis* Crowcroft, 1947, *B. tarponis* Sogandares-Bernal and Hutton, 1959, and *B. congeri* Yamaguti, 1970. In the present specimens also intestinal ceca extend posterior to testis. Comparing them with these three species they have obvious important differences with *B. tarponis*. Further, they come very close to *Bivesicula australis* but differ mainly in shape and size of the oral sucker and in the posterior extent of vitelline follicles. In *B. australis* oral sucker has been described to be funnel-shaped and its maximum width at the top is equal to the width at anterior end of body, whereas in the present specimens the oral sucker is squarish and much less in width than that of the anterior end of the body (Text-fig. 3B). Moreover, in Crowcroft's species the vitelline follicles do not reach level of testis, whereas in the present specimens they do reach. Judging from Fig. 13 (Crowcroft, 1947 p. 21) and keeping in view these two characters we are inclined to consider them variations only. Such discrepancies creep in some specimens of a population during processing depending upon the conditions of contraction and relaxation. Yamaguti (1970) did not compare his species, *B. congeri* with *B. australis*, and we consider the slight