

REMARKS ON SOME KNOWN SPECIES OF DIGENETIC
TREMATODES (DIGenea : ACANTHOCOLPIDAE LUHE, 1909)
FROM MARINE FISHES OF INDIA

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INTRODUCTION

The acanthocolpid materials on the basis of which the present study has been made were collected from the fishes of the Arabian Sea and the Bay of Bengal. It includes the material on which the author (1971, 78) had made studies on the family Acanthocolpidae. It also includes the material of the family collected by Dr. T. D. Soota and Party during 1975 - 76. All the 45 slides have been deposited in the Helminthological Collections of the Zoological Survey of India, Calcutta. The drawings have been made with the aid of a camera lucida. All measurements are in micrometers unless otherwise stated.

SYSTEMATIC ACCOUNT

Family ACANTHOCOLPIDAE Luhe, 1909

Genus *Stephanostomoides* Mamaev and Oshmarin,
1966
Stephanostomoides tenuis (Manter, 1963)
Hafeezullah, 1978.

Syn. *Acanthocolpus tenuis* Manter, 1963
Stephanostomoides dorabi Mamaev and Oshmarin, 1966
S. indicus Karyakarte and Yadav, 1976 (n. syn.)
S. sharmai Gupta, S. P. and Gupta R. C. 1980 (n. syn.)
(Fig. 1)

Host : *Chirocentrus dorab*. wolfherring, (Pisces : Chirocentridae).

Location : Tuticorin, Mandapam (Gulf of Mannar); Gopalpur, Pondicherry (Bay of Bengal), Mangalore, Kozhikode (Arabian Sea)

Number of specimens : 2+4+2+1+2+4 respectively, total 15, on 8 slides.

Specimens deposited : Z.S.I. Reg. Nos. W7502/1 to W 7509/1.

Remarks : Hafeezullah (1978) showed that the spines of the five rings on the oral sucker of the specimens of the genus *Stephanostomoides* occurring in the fish *Chirocentrus dorab* may be partly or wholly shed off due to maceration or during processing after separating

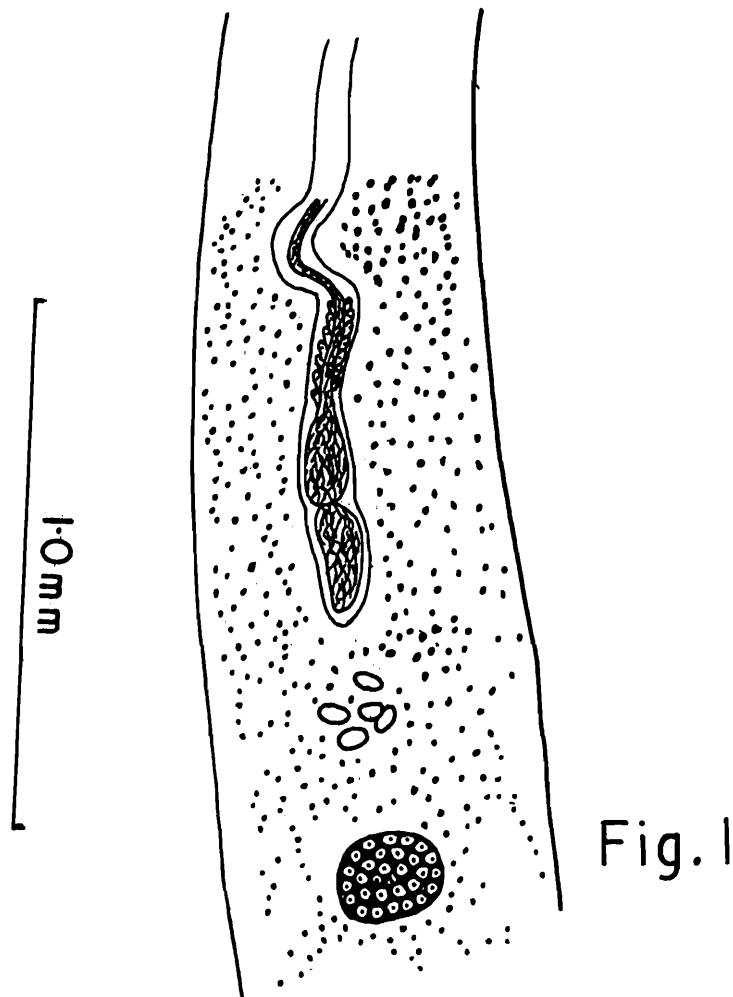


Fig. 1. *Stephanostomides tenuis* (Manter, 1963), showing bipartite internal seminal vesicle.

from the host and thus considered *Acanthocolpus tenuis* Manter, 1963 nothing but *Stephanostomoides tenuis* (Manter, 1963). *Stephanostomoides dorabi* Mamaev and Oshmarin, from North - Vietnam Bay, *S. indicus* Karyakarte and Yadav, 1976 from Arabian Sea, and *S. Sharmai* Gupta, S. P. and Gupta, R. C., 1980 from the Bay of Bengal, all from the fish, *Chirocentrus dorab*, vary insignificantly from *S. tenuis* in various body measurements and egg size. Therefore, they are considered as synonyms of *S. tenuis* (Manter, 1963). Manter (1963), Hafeezullah (1978) Madhavi (1976) and Radhakrishnan and Nair (1979) had specimens of the same species with the five rings of the spines completely lost, and therefore reported their specimens under the genus *Acanthocolpus* as *A. tenuis*. Gupta, V. and Ahmed, J. (1977), while reporting *Stephanostomoides dorabi* Mamaev and Oshmarin, 1966 from the Bay of Bengal in the fish, *Chirocentrus dorab*, state that in their specimens the seminal vesicle is unipartite as compared to the bipartite condition in the original description by Mamaev and Oshmarin (1966). In the present material some of the specimens look to possess unipartite seminal vesicle whereas others (Fig. 1) definitely have bipartite seminal vesicle, *Stephanostomoides tenuis* (Manter, 1963) Hafeezullah, 1978 is the type and the only species in the genus thus far.

Genus *Stephanostomum* Looss, 1899
Metacercaria of *Stephanostomum* sp.
(Figs. 2, 3)

Host : *Tetrodon reticularis*, puffer fish, (Pisces : Tetrodontidae)

Location : Intestine.

Locality : Pondicherry, collected on 8.12.1975.

Number of specimens : One, on slide.

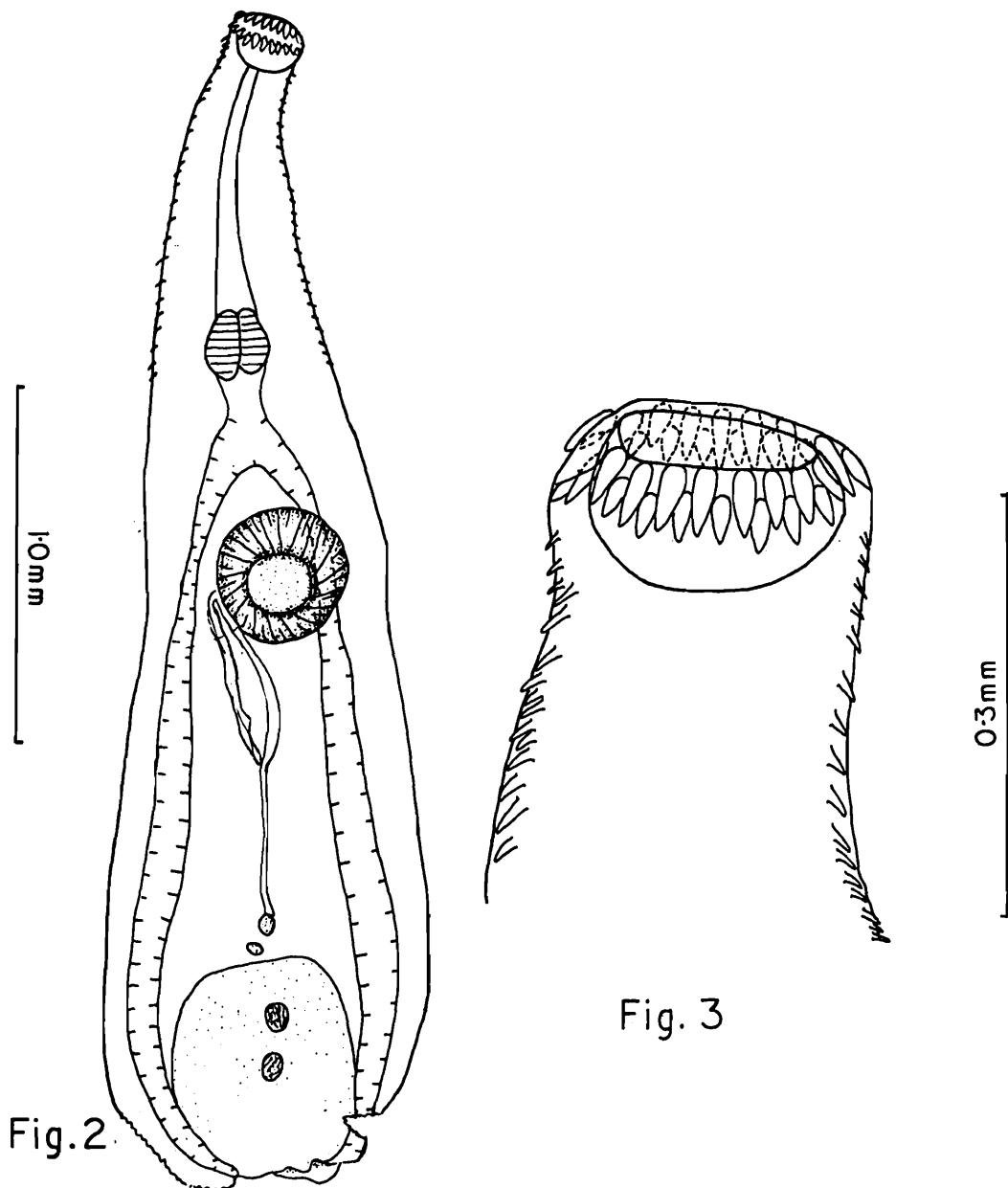


Fig. 2. Metacercaria of *Stephanostomum* sp., entire worm.

Fig. 3. Anterior part of metacercaria of *Stephanostomum* sp., showing two alternating rings of peribuccal spines.

Specimens deposited : Z.S.I. Reg. No. W 7510/1

Description : Body 3.457 mm long, 0.954 mm wide at testicular level, anterior part elongate, posterior part swollen, (at posterior end the material is a bit broken). Tegument armed with spines, closely set in cephalic region, becoming sparse posteriorly. Eye-spot pigment present. Acetabulum 378 in diameter, situated at 1376 from anterior end of the body. Oral sucker 129 long, 189 wide, wider than long, terminal. Mouth terminal. Peribuccal spines 36 in two alternating rings each with 18 spines. Prepharynx 645 long. Pharynx pear-shaped, 224 long, 189 wide; oesophagus present, 155 long; intestine triclad, caecal bifurcation between pharynx and acetabulum; caeca simple extending up to posterior end of body.

Testes 395-430 long, 284-301 wide, entire, situated in swollen part of body, separated from each other. Cirrus sac, long, reaching posteriorly midway between acetabulum and ovary, spines not yet developed on cirrus.

Ovary 258 in diameter, globular, entire, pretesticular, separated from anterior testis, shell gland complex behind ovary. Uterus preovarian, Metraterm long, narrow, as long as cirrus, spines not yet developed on it. Genital atrium long. Genital pore pretesticular.

Excretory pore terminal; excretory vesicle sacciform. Uroproct present.

The number and arrangement of peribuccal spines, wider than long oral sucker, very long prepharynx, presence of a short oesophagus, long and equal cirrus sac and metraterm point to its relationship with *Stephanostomum casum* as reported by Durio and Manter (1969) from New Caledonia.

Genus *Tormopsolus* Poche, 1926

Tormopsolus filiformis Sogandores - Bernal and Hutton, 1959.

Syn. *Tormopsolus rhachicentri* Parukhin, 1965

Tormopsolus spatulatum Bilqeas, 1972

(Figs. 4, 5)

Host : *Rachycentron canadus* (Linn.), Cobia, (Pisces : Rachycentridae).

Location : Intestine.

Localities : Kakinada (Bay of Bengal), Vasco-da-Gama (Arabian Sea).

Number of specimens : 7 + 11, total 18, on 3 slides.

Specimens deposited : Z.S.I. Reg. Nos. W 7511/1 to W 7513/1.

Remarks : *Tormopsolus rhachicentri* Parukhin, 1965 from *Rachycentron canadus* from South China Sea, has a distinct oesophagus and a distinct prepharyngeal part of body. Bilqeas (1972) described *T. spatulatum* with a very long oesophagus and a distinct spatulate prepharyngeal part of forebody from a different fish host, *Cybium* sp., from Karachi, Arabian Sea. Madhavi's (1976) specimens of *T. filiformis* from *Rachycentron canadus* from Waltair coast (Bay of Bengal) do have spatulate prepharyngeal part of forebody but the statement that her "specimens agree with the original description of *T. filiformis* from the same host" implies that an oesophagus is absent in them or it is

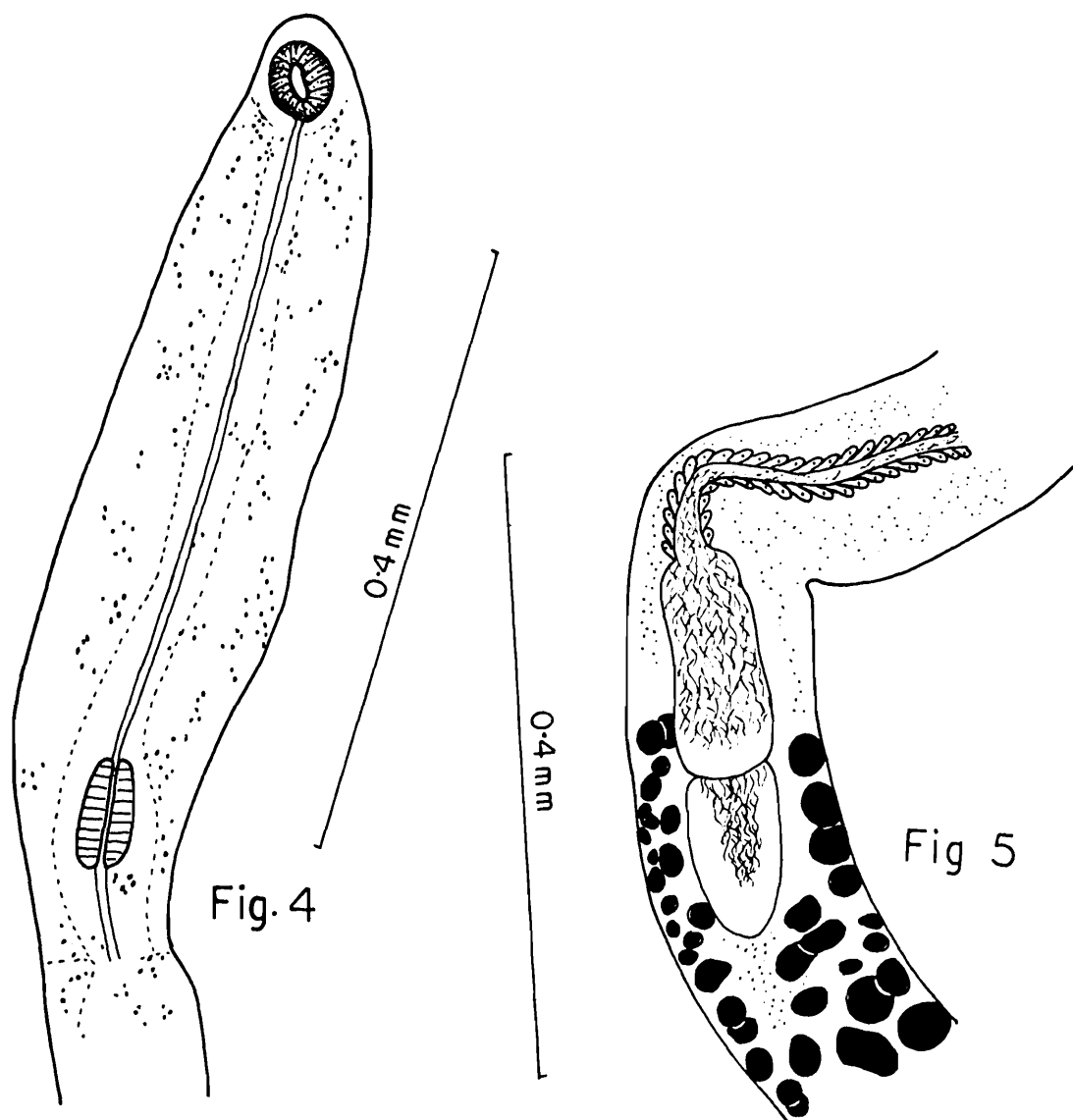


Fig. 4. *Tormopsolus filiformis* ; spatulate prepharyngeal part of forebody.
 Fig. 5. *Tormopsolus filiformis* ; bipartite internal seminal vesicle.

indistinctly short. In *T. filiformis* Sogandares - Bernal and Hutton, 1959 from *Rachycentron canadus* from off Madeira, Florida, Gulf of Mexico, an oesophagus is stated to be absent (or indistinct) but from its illustration No. 10A, it appears that the forebody or the prepharyngeal part of the body is comparatively more flattened (if not fully spatulate) than the rest of the body. The absence (or indistinctness) of the oesophagus and incomplete spatulate form of forebody may be due to the contracted condition of the material at the time of killing and fixation. Contrarily, the distinct presence of an oesophagus and the degree of its elongation (as in *T. rhachycentri* Parukhin, 1965 and *T. spatulatum* Bilquees, 1972) as well as the fully spatulate condition of the prepharyngeal part of the body may be due to the degree of relaxation of the specimens at the time of fixation. These implications are evident from the study of the 18 specimens involved in the present study. Further, *T. rhachycentri* has been described to possess a unipartite internal seminal vesicle but the illustration of the species shows a bipartite one. The structure seems to have been studied erroneously. Sometimes the division of the internal seminal vesicle is not seen clearly.

Thus, keeping in view all these implications, I am inclined to believe that my specimens are referable to *Tormopsolus filiformis* Sogandares - Bernal and Hutton, 1959, and *T. rhachycentri* Parukhin, 1965 and *T. spatulatum* Bilqees, 1972 are its synonyms.

Genus *Acanthocolpus* Luhe, 1906
***Acanthocolpus liodorus* Luhe, 1906**

Syn. *A. inqlisi* Gupta, S.P. and Gupta, R.C., 1980 (n. syn.)

A. guptai Gupta, V. and Puri, M., 1981 (n. syn.)

(Fig. 6)

Host : *Chirocentrus dorab*, dorab wolf herring, (Pisces : Chirocentridae)

Location : Intestine.

Localities : Veraval, Bombay, Kozhikode (Arabian Sea).

Number of specimens : 3 + 24 + 25 respectively, total 52, on 15 slides.

Specimens deposited : Z.S.I. Reg. Nos. W 7514/1 to W 7528/1

Remarks : *Acanthocolpus* Luhe, 1906 has a median and immediately preacetabular genital pore. This is basic and constant. In pedunculate and protuberant specimens it is situated in the angle of the body with the peduncle/protuberance, and this is not a deviation from the basic concept. At the same time, it also does not mean that the genital pore is postacetabular in pedunculated specimens. However, in improperly processed or decaying specimens, the genital pore may appear to be situated elsewhere in the base of the peduncle because the genital sinus is tubular with very thin wall and after flattening the specimens it becomes untraceable and the worker erroneously interprets the genital pore to be situated where the genital ducts look to terminate.

Acanthocolpus liodorus Luhe, 1906 is the type species of the genus. Its body is pedunculate, oral sucker smaller than the ventral sucker, genital pore is situated in the angle of the body with the peduncle, the anterior extent of vitellaria is almost up to the middle of the body, posterior extent of the cirrus sac is near the anterior extent of vitellaria, and the gonads are contiguous or slightly separated. Keeping in view this concept of *A. liodorus*, the two species *A. inqlisi* Gupta, S.P. and Gupta, R.C., 1980 and *A. guptai* Gupta, V. and Puri, M., 1981 fall synonyms to the former.

***Acanthocolpus Luhei* Srivastava, 1939**

(Fig. 7)

Host : *Chirocentrus dorab*, dorab wolf herring, (Pisces : Chirocentridae).

Location : Intestine.

Localities : Veraval, Bombay (Arabian Sea), and Pondicherry (Bay of Bengal).

Number of specimens : 1 + 6 + 16 respectively, total 23, on 11 slides.

Specimens deposited : Z.S.I. Reg. Nos. W 7529/1 to W 7539/1.

Remarks : The distinction between *A. liodorus* and *A. Luhei* is crystal clear, as originally mentioned by Srivastava (1939) and later on noted and confirmed by Mamaev and

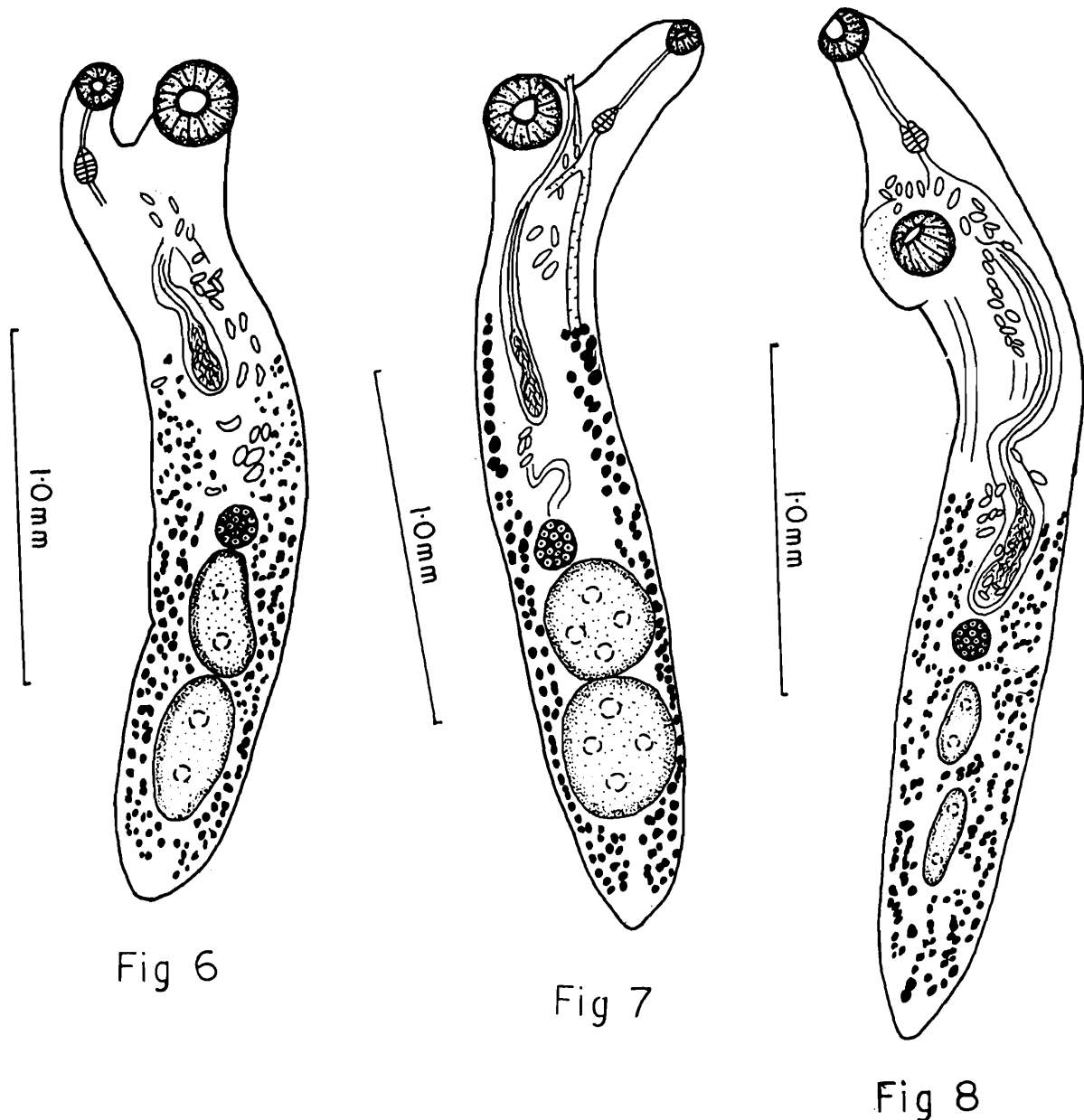


Fig. 6. *Acanthocolpus liodorus* ; entire worm. Fig. 7. *Acanthocolpus luhei* ; entire worm.
 Fig. 8. *Acanthocolpus caballeroi* ; entire worm.

Oshmarin (1966), Hafeezullah (1971, 78), Gupta, A.N. and Sharma, P.N. (1972) and Pandey and Tiwari (1984). The synonymy of *A. luhei* with *A. liodorus* as suggested by Caballero (1952), Yamaguti (1958, 71) and Manter (1963), is based merely on assumption and not on the basis of scientific evidence. The conclusion of the author is reinforced by the fresh fact that the whole population of 16 specimens recovered at Pondicherry from the fish *Chiricentrus dorab* consists of *A. luhei* only, unmixed with any specimen of *A. liodorus*, although the two species may occur together in the same specimen of the fish host. The morphological and anatomical differences as indicated by Srivastava (1939) and re-established by Mamaev and Oshmarin (1966), Hafeezullah (1971, 78), Gupta, A. N. and Sharma, P.N. (1972) and Pandey and Tiwari (1984) are maintained here in the light of fresh evidence. The distinction of *A. luhei* from *A. liodorus* is based on a combination of constant characters. The distinguishing characters between them have never been shown to be

variable. *Acanthocolpus manteri* Pandey and Tiwari, 1984 in the intestine of *Euthynnus* sp. from Bombay coast is quite obviously a synonym of *A. luhei*.

***Acanthocolpus caballeri* Gupta and Sharma, 1972**

Syn. *Acanthocolpus puriensis* Gupta, V. and Puri, M, 1981 (n. Syn.)

A. lucknowensis Gupta, V. and Puri, M, 1981 (n. Syn.)

(Fig. 8)

Host : *Chirocentrus dorab*, dorab wolf-herring, (Pisces:Chirocentridae)

Location : Intestine

Localities : Chandipur, Konarak and Digha (Bay of Bengal)

Number of specimens : 8 + 8 + 23 respectively, total 39 on 7 slides.

Specimens deposited : Z.S.I. Reg. Nos. W 7540/1 to W 7546/1.

Remarks : Hafeezullah (1978) considered *A. caballeri* to be a synonym of *A. luhei*, thinking that the difference between them are too meager to warrant a separate species as against *A. luhei*. But, after the appearance of the descriptions of *A. puriensis* and *A. lucknowensis*, the author restudied his acanthocolpid collection and came to the conclusion that there are populations of specimens unmixed with others which can be considered as a separate species intermediate between *A. liodorus* and *A. luhei*. Such specimens represent *A. caballeri* which is revalidated here. This species is pedunculate and has vitellaria anteriorly extending up to almost mid-body as in *A. liodorus*, and a long cirrus sac whose appreciable part is overlapped by the anterior extent of vitellaria as in *A. luhei*. However, it significantly differs from *A. liodorus* as follows: In *A. liodorus* the cirrus sac is short and the vitellaria begin from behind its swollen base, whereas in *A. caballeri* the cirrus sac is long and narrow and the vitellaria overlap an appreciable part of it. The postacetabular attenuation of body in unpressed specimens occurs in both species. The shape and structure of suckers are also similar in both of them. Further, *A. caballeri* materially differs from *A. luhei* in possessing a peduncle rather than a slight protuberance and in having vitellaria up to about midbody only rather than extending much more anteriorly. *A. puriensis* and *A. lucknowensis* are identical and both of them do not differ from *A. caballeri* at all. Hence, *A. puriensis* and *A. lucknowensis* are synonyms of *A. caballeri*.

Acanthocolpus orientalis Srivastava, 1939, described from the carangid fish, *Caranx kalla*, from Puri, has been discovered by Madhavi (1976) to possess 32 oral spines arranged in two rows. She recovered specimens from three carangid fishes from Waltair coast, an adjoining locality, and therefore she transferred it to the genus *Stephanostomum* as *S. orientalis* (Srivastava, 1939) Madhavi, 1976.

SUMMARY

The paper deals with interesting observations and consequent remarks of five known species of degenerate trematodes of marine fishes of India belonging to four genera in the family Acanthocolpidae Luhe, 1909. They are : *Stephanostomoides tenuis* (Manter, 1963), metacercaria of *Stephanostomum* sp., *Tormopsolus rhachicentri* Parukhin, 1965,

Acanthocolbus Liodorus Luhe, 1906. *Acanthocalpus Luhei* Srivastava, 1939 and *A. caballeroi* Gupta, A. N. and Sharma, P. N., 1972. As a result of the study, *Stephanostomoides dorabi* Mamaev and Oshmarin, 1966, *S. indicus* Karyakarte and Yadav, 1976 and *C. Sharmai* Gupta, S.P. and Gupta, R. C., 1980 have been found to be synonyms of the type and only species *S. tenuis* (Manter, 1968) Hafeezullah, 1978. A metacercaria of *Stephanostomum* sp. from the puffer fish, *Tetrodon reticularis*, is reported and figured. Its characters indicate that it may be the metacercaria of the species *Stephanostomum casum* (Linton, 1910) Mc arlane, 1934. The species *Tormopsolus filiformis* Sogandares - Bernal and Hutton, 1959 is reported here from the fish *Rachycentron conadus* from the Bay of Bengal and the Arabian Sea, and it is believed that *T. rhachycentri* Parukhin, 1965 and *T. Spatulatum* Bilqeess, 1972 are its synonyms. Contrary to the opinion of Gupta, S. P. and Gupta, R. C. (1980), and Gupta, V. and Puri, M. (1981), it has been shown beyond doubt once again that *Acanthocalpus luhei* Srivastava, 1939 is distinct from the type species, *A. liodorus* Luhe, 1906, in spite of the fact that both these species may be occurring mixed together in one and the same specimen of the fish *Chirocentrus dorab*. Further, *Acanthocalpus caballeroi* Gupta, A. N. and Sharma, P. N., 1972 which was considered by Hafeezullah (1978) as a synonym of *A. luhei* Srivastava, 1939, is resurrected after restudy. It has been shown that *A. inqlisi* Gupta, S. P. and Gupta, R. C., 1980 and *A. guptai* Gupta, V. and Puri, M., 1981 are synonyms of *A. liodorus*; and *A. puriensis* Gupta, V. and Puri, M., 1981 and *A. lucknowensis* Gupta, V. and Puri, M., 1981 are synonyms of *A. caballeroi*.

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