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ON THE MONOTYPY OF THE GENERA *ANCHITREMA* LOOSS, 1899 AND *TREMIORCHIS* MEHRA AND NEGI, 1926 WITH A NOTE ON *PLEUROGENES-PLEUROGENOIDES-INDOPLEUROGENES-ALLOINDOPLEUROGENES* COMPLEX

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ABSTRACT

A large number of specimens collected from the coastal belt of Orissa and W. Bengal from bats and frogs belonging to the families Anchitrematidae, Brachycoeliidae and Lecithodendriidae have been studied. The genus *Mujibia* Bilqees and Kaikobad, 1972 has been presumed to be congeneric with *Anchitrema* Looss, 1899 which is most probably a monotypic genus. The validity of various species in the genus *Tremiorchis* Mehra & Negi, 1926 has been considered. It has been concluded that the status of the genus *Tremiorchis* also is monotypic. Several populations of specimens belonging to the genus *Pleurogenoides* Travassos, 1921 have also been studied. It has been indicated that most of the characters of various species show variations. *Pleurogenoides sitapurii* (Srivastava, 1934) has been found to be synonymous with *P. solus* (Johnston, 1912). Further, the genus *Pleurogenes* Looss, 1896 is, no doubt, monotypic with *P. claviger* as its type species. The rest of the species belong to the genus *Pleurogenoides*. *Indopleurogenes* Yamaguti, 1971 has been found untenable and therefore a synonym of *Pleurogenoides*. Doubt has been cast on the tenability of the genus *Alloindopleurgenes* Kalyankar and Palladwar, 1977 in favour of *Pleurogenoides gastroporus*.

The present study is based on collections of populations of digenetic trematodes of bats and frogs made from various places along the east coast of India including West Bengal. Actually this is a study of variations among the individuals of a population. Relevant literature was closely scrutinized in the light of the findings. Consequently, some interesting conclusions have been drawn. All the specimens have been deposited with the National Collection at the Zoological Survey of India, Calcutta.

Family ANCHITREMATIDAE Mehra, 1935

Genus **Anchitrema** Looss, 1899

Syn. *Exorchocoelium* Thapar, 1931

Anchitrema sanguineum (Sonsino, 1894) Looss, 1899

(Fig. 1)

Host : *Pipistrellus mimus*, Indian Pygmy Pipistrelle, (Vespertilionidae)

Location : Intestine

Locality : Bhajna, 24-Parganas (W. Bengal)

No. of specimens: 6, collected on May 2, 1977

Specimens deposited : Z. S. I. Reg. No. W7299/1

These specimens are referred to *Anchitrema sanguineum* (Sonsino, 1894).

Anchitrema Looss is the genus of trematodes infecting mainly bats and chameleons, but it has also been reported from common shrew, *Suncus murinus*, by Ghosh (1978). Thapar's (1931, 1956) genus *Exorchocoelium* as against *Anchitrema* has been synonymised by Pandey (1935) and concurred by Agrawal (1966). This synonymy is beyond doubt and has been accepted by Yamaguti (1971) also. *Platynosomum philippinorum* Tubangui, 1928 and *Platynosomum philippinorum congolense* Sandground, 1937 were transferred to the genus *Anchitrema* by Skarbilovich (1948). It should be noted that the various species of *Anchitrema* resemble each other very much and differ only in relative sizes of organs and body proportions. Rohde (1966) made a large collection of specimens of *Anchitrema* from various species of bats in Malaya. He studied them very carefully population-wise. He found that the differences among species of *Anchitrema* "are due to allometric growth of various organs and parts of the body" Consequently, he synonymised *A. philippinorum* (Tubangui, 1928) and *A. congolense* (Sandground, 1937) with *A. sanguineum*. Saoud and Ramadan (1977) made an exhaustive collection of specimens of *Anchitrema* from Egyptian bats and studied them. They reviewed the genus *Anchitrema* synonymising *A. congolense* with *A. latum* Gedoelst, 1919, and *A. lucknowensis* Agrawal, 1966 with *A. philippinorum*. They, further, redescribed *A. sanguineum* and described a new species *A. longiformis*. While differentiating this new species of *Anchitrema*, the authors state that it resembles

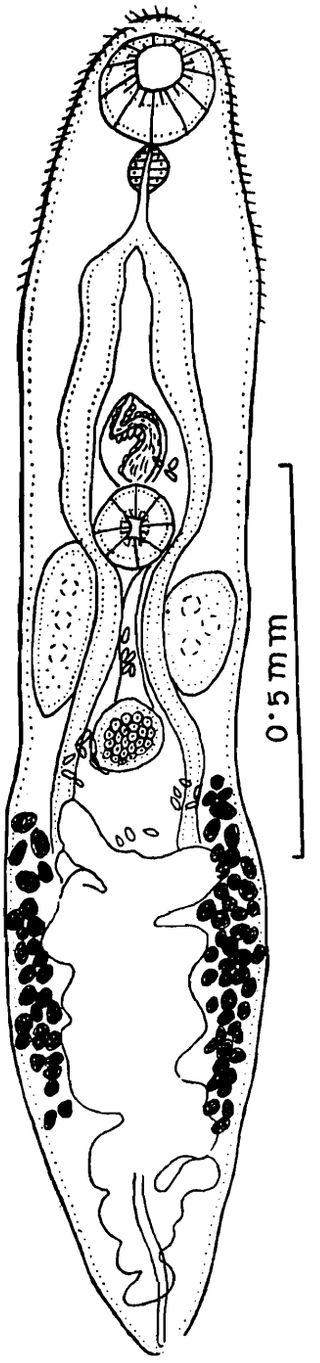


Fig. 1. *Anchitrema sanguineum* (Sonsino, 1894). Ventral View.

A. philippinorum most. Bilqees and Kaikobad (1972) proposed a new genus *Mujibia* (type species *M. elongatum*) from an unidentified snake from Sind, Pakistan. They differentiated it from *Anchitrema* on the basis of

unspined body, large oral sucker, absence of oesophagus, and wide ceca, and testes located behind the posterior region of the cecal ends. It may be pointed out that the type species *Mujibia elongatum* has been described on the basis of a single specimen, and the characters used in differential diagnosis are also found in *Anchitrema*. It has been observed that in some specimens of *Anchitrema sanguineum* the parts of the ceca behind testes get obscured by the testes themselves, coils of uterus and follicles of vitellaria specially in bad preservations. Probably this has happend in Bilqees and Kaikobad's specimen of *M. elongatum*. In *Anchitrema* a very short oesophagus has been reported which may be rendered indiscernible in some contracted specimens. The authors are inclined to believe that *Mujibia elongatum* Bilqees and Kaikobad, 1972 is nothing but *Anchitrema sanguineum* (Sonsino, 1894). But, as the type specimen is difficult to make available for re-examination, *Mujibia* is presumed to be a synonym of *Anchitrema*.

The excellent works of Rohde (*loc. cit.*) and Saoud and Ramadan (*loc. cit.*) on large collections of specimens of *Anchitrema* from the bats of Malaya and Egypt respectively, throw light on the very close resemblances of various species, and the ultimate results of their work are overlapping of synonymies among the species of *Anchitrema* to the extent that the genus is rendered monotypic.

Family BRACHYCOELIIDAE Johnston, 1912

Genus **Tremiorchis** Mehra and Negi, 1925

Syn. *Centrovitus* Bhalerao, 1926

Tremiorchis ranarum Mehra and Negi, 1926

Syn. *T. mehrai* Rai, 1962
T. vitelloconfluentum Rai, 1962
T. attenuatus Karyakarte, 1973 n. syn.
T. tigrinarum Sinha *et al*, 1974 n. syn.
T. mathuraensis Swarup and Jain, 1976 n. syn.

Host : *Rana cyanophlyctis* (Amphibia : Ranidae)
Location : Intestine
Locality : Puri (Orissa)
No. of specimens : 8, collected on June 5, 1972.
Specimens deposited : Z. S. I. Reg. Nos. W7300/1—W7301/1

These specimens are identified as *Tremiorchis ranarum*. It is well known that *Tremiorchis ranarum* shows variations and abnormalities. Studies of Bhardwaj (1962) reveal this. Of the six species reported in the genus *Tremiorchis*, *T mehrai* Rai, 1962 and *T. vitelloconfluentum* Rai, 1962 have been synonymised by Mukherjee and Ghosh (1970) with *T. ranarum* in the light of Bhardwaj's work, *T varanum* Verma, 1930 has been transferred in the genus *Astiotrema* Looss, 1900 by the same authors. We concur with these synonymies and transfer. *T attenuatus* Karyakarte, 1973 and *T. tigrinarum* Sinha *et al*, 1974 also do not look different from the type species, *T ranarum*. In the population of few specimens of the type species some minor and insignificant variations are always noted. All the specimens are not fixed in the same state of contraction or relaxation. Sometimes excessive pressure is used for flattening the flukes. Some populations are collected when the flukes are less mature while others are collected at an advanced state of maturity. All these factors cause variations, distortions or differences as the workers may interpret them. Some of the body spines may be shed off during processing. The anterior part of the pharynx is almost always overlapped by the oral sucker, making it difficult to detect the presence or absence of the short prepharynx. The seminal receptacle may occupy any position in the vicinity

of the ovary. Sometimes its normal position is affected by the amount of pressure applied for flattening. If the orientation of the fluke is not made proper before pressing under cover glass, the acetabulum may be deflected this way or that way. *T attenuatus* Karyakarte, 1973 and *T tigrinarum* Sinha *et al*, 1974 are based, it is believed, on variations in *T ranarum*. Therefore, the former two species are considered as synonyms of the latter.

Tremiorchis mathuraensis Swarup and Jain, 1976 has been described on the basis of specimens which were in an advanced state of maturity leading to massive development of uterine coils and bigger growth of vitelline follices, and due to excessive pressure applied during pressing groups of follicles got coalesced together giving rise to their lobulated appearance. We, therefore, think that *T mathuraensis* is nothing but *T. ranarum*. *Tremiorchis* Mehra and Negi, 1926 is thus far monotypic.

Family LECITHODENDRIIDAE

Genus **Pleurogenoides** Travassos, 1921

Syn. *Sonsinotrema* Balozet *et* Callot, 1938
Indopleurogenes Yamaguti, 1971 n. syn.

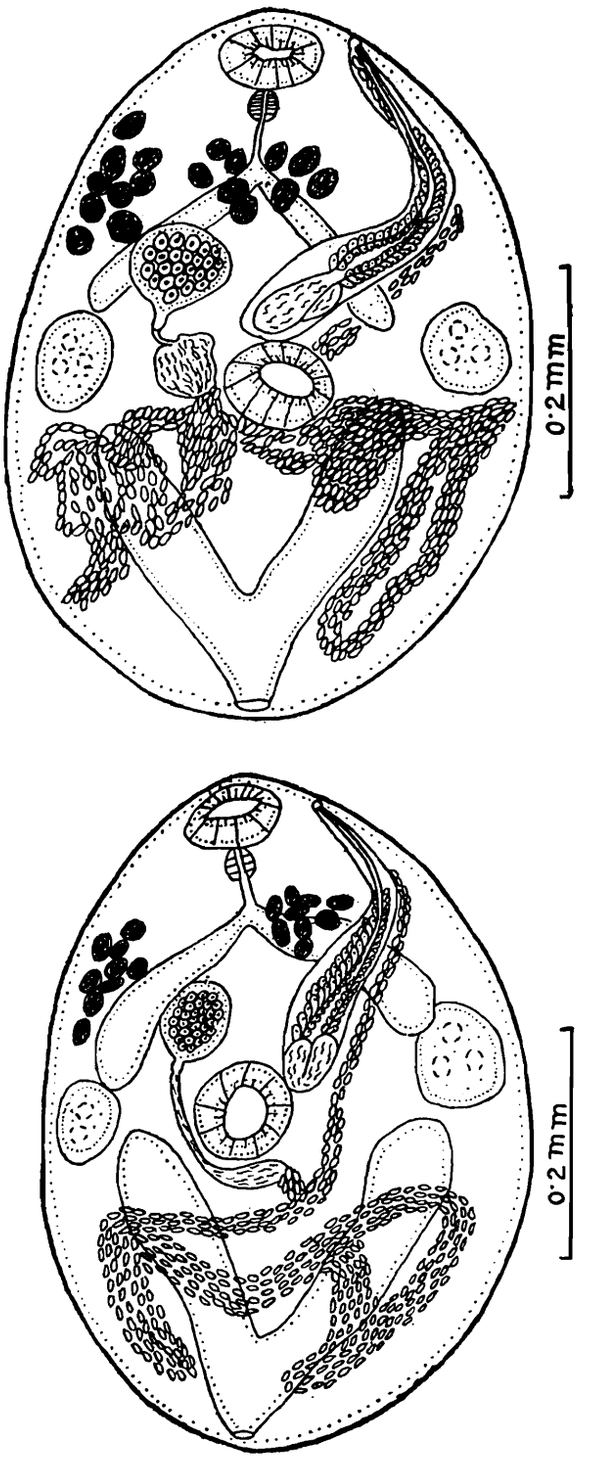
Pleurogenoides solus (Johnston, 1912)

P. sitapurii (Srivastava, 1934) n. syn.

(Figs. 2, 3)

Host :	*Rana cyanophlyctis* (Amphibia : Ranidae)
Location :	Intestine
Locality :	Chandbali (Orissa)
No. of specimens :	20, collected on December 24, 1973.
Specimens deposited :	Z. S. I. Reg. Nos. W7302/1—W7306/1

Johnston (1912) described his species from *Hyla aurea* from Australia. Srivastava (1934) distinguished his species from the closely resembling species, *P solus* (Johnston, 1912),



Figs. 2 & 3. *Pleurogenoides solus* (Johnston, 1912) Ventral View. Showing some variations.

on the basis of the length of oesophagus and intestinal ceca, position and size of gonads

(probably in relation to acetabulum), size and number of the vitelline follicles, arrangement of uterine coils and position of excretory pore. Most of these characters are found to be variable in the present collection. After studying the original description of the two species and comparing them with our specimens, Srivastava's does not seem to be materially distinct from Johnston's and the variations in the present twenty specimens further reduce the gap between the two so that *Pleurogenoides sitapurii* appears to be conspecific with *P solus*.

Pleurogenoides gastroporus Lühe, 1901

(Fig. 4)

Syn. *P. equalis* Mehra and Negi, 1928
P. orientalis Srivastava, 1934
P. sawanensis Gupta, 1954

Host :	*Rana cyanophlyctis*, (Amphibia : Ranidae)
Location :	Intestine
Localities :	Chandipur, Chandbali, Gopalpur, Konarak and Puri (Orissa) ; Bakkhali and Ankhola in 24-Parganas (West Bengal).
No. of specimens :	Several, collected in 1972, 1973 and 1977.
Specimens deposited :	Z. S. I. Reg. Nos. W 7307/1—W 7324/1

Many populations of this species were collected from the same species of frog from the places noted above. They exhibit variations in the absence or presence of short oesophagus, distribution of vitellaria and level of genital opening. Mehra and Negi (1928) have already indicated such variations. In view of the variations, we concur with Mukherjee and Ghosh (1970) that *P equali* Mehra and Negi, 1928, *P, orientalis* Srivastava, 1934 and *P sawanensis* Gupta, 1954 are synonymous with *P. gastroporus* Lühe, 1901.

The validity of *Pleurogenoides* Travassos, 1921 as against *Pleurogenes* Looss, 1896 has been disputed by some workers like Gupta and Agrawal (1966) and Kakaji (1968). Mukherjee and Ghosh (1970) and Yamaguti (1971) considered the two genera as distinct one from the other. But Yamaguti (1971) added a third element in the confusion. He elevated *Pleurogenoides orientalis* Srivastava, 1934 to the rank of a new genus, *Indopleurogense*, distinct from both the above genera in characters like absence of oesophagus, vitellaria extending over the ceca and the genital pore having gone to the level of oral sucker. The authors have studied a large number of specimens belonging to the *Pleurogenoides-Indopleurogenes* complex and observed variations in characters population-wise. In an attempt to solve the confusion on the basis of this study it would be better to consider *Pleurogense* Looss, 1896 as a monotypic genus (type species : *P. claviger*) in which massive coils of uterus come between acetabulum and testes throwing the latter near the hind end of the body. The rest of the species in which the colis of uterus do not come between the two organs and consequently the testes remain in the acetabular zone should be brought under the genus *Pleurogenoides* Travassos, 1921. In view of the variations observed in the specimens collected from Puri, Konarak and Gopalpur (Orissa State), the type species of *Indopleurogenes* Yamaguti, 1971, *I. orientalis* (Srivastava, 1934) falls as a synonym of *Pleurogenoides gastroporus* Lühe, 1901. Therefore *Indopleurogense* becomes untenable and synonymous

with *Pleurogenoides*. *Alloindopleurogenes* Kalyankar and Palladwar, 1977 is probably based on distorted specimens of *P. gastroporus*.

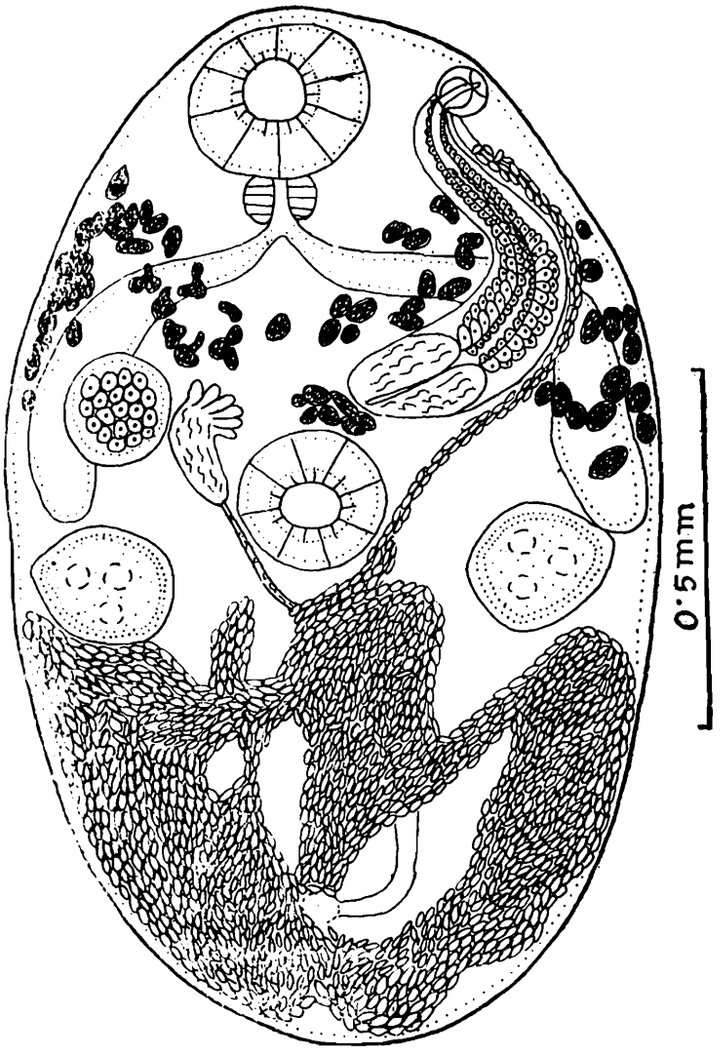


Fig. 4. *Pleurogenoides gastroporus* Luhe, 1901. Ventral View.

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