

A Discussion of the Trematode Genus *Pleorchis* Railliet, 1896 (Digenea: Pleorchiidae Poche, 1926) With Description of Two New Species From the Intestine of Marine Fishes From the Indian Ocean

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Abstract. Two new species of Trematodes of family Pleorchiidae are reported from the intestine of marine fishes from sea coast of Deegha, West Bengal, India (Indian Ocean): *Pleorchis santoshai* n.sp. from *Parascorpaena picta* (Cuvier) and *Pleorchis keshavai* n.sp. from *Trachynotus botla* (Shaw). In this study, status of genus *Pleorchis*, has also been critically discussed, and it is proposed that the genus *Pleorchis* Railliet, 1896 must be classified as member of superfamily Lepocreadioidea (Odhner, 1905) Bray, 2005 and family Pleorchiidae Poche, 1926.

Keywords: Digenea, Intestinal parasites, Lepocreadioidea, Pleorchiidae, *Pleorchis*.

INTRODUCTION

Conditions on the earth are not favorable everywhere for every living being, in this way all animals adapted specifically for their benefits and survival in suitable environment. Digeneans of genus *Pleorchis* Railliet, 1896 are rare distomes living as parasite in the intestine of marine fishes. In this study, two new species of the genus *Pleorchis* are described on the basis of living ovigerous specimens recovered from the intestine of marine fishes at sea coast of Deegha (latitude 21.68° N and longitude 87.55° E), West Bengal, India (Indian Ocean) on account of having unique morphological features. The current status of family Pleorchiidae Poche, 1926, has also been discussed.

MATERIALS AND METHODS

The ovigerous specimens of the trematode were collected live from the intestine of *Parascorpaena picta* (Cuvier) and *Trachynotus botla* (Shaw) respectively, fixed under a slight pressure of coverglass in AFA fixative (50% alcohol, formaline and acetic acid in a ratio of 100:6:2.5). The parasites were stained in aqueous Acetoalum carmine, differentiated in acid water, dehydrated through ascending series of ethanol,

cleared in xylol and mounted in Canada balsam. The diagrams were made with the aid of camera lucida. The measurements of ovigerous specimens are given in millimeter (mm). In the present work distance between anterior extremity of the body and anterior margin of the ventral sucker is referred as 'forebody' and the distance between posterior margin of the ventral sucker and posterior extremity of the body is referred as 'hindbody'. The voucher specimens submitted to the depository of the Helminthological Society of India of Late Prof. S.P. Gupta, University of Lucknow, India.

RESULTS AND DISCUSSION

Poche (1926) was placed the genus *Pleorchis* Railliet, 1896 and *Schistorchis* Lühe, 1906 under family Pleorchiidae. Cable and Hunninen (1942) considered the family Pleorchiidae invalid, revealing that *Pleorchis* and *Schistorchis* are not closely related. They were placed the *Pleorchis* in family Acanthocolpidae. Yamaguti (1942) was separated the *Pleorchis* and *Schistorchis*. He was placed the genus *Pleorchis* under family Pleorchiidae Poche, 1926, and erected a new family Schistorchiidae for the genus *Schistorchis*. Caballero y Caballero (1952) was considered the *Pleorchis* as member of sub-family Pleorchiinae of Acanthocolpidae. After it, some workers considered the *Pleorchis* as member of Acanthocolpidae Lühe, 1906 (Caballero y Caballero, 1952; Skrjabin, 1954; Parukhin, 1974; Bartoli *et al.*, 2004). It seems that,

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the above workers were tentatively considered the character 'spiny tegument' for establishing the family of *Pleorchis*. But spiny tegument is not found in all known species of *Pleorchis*. Several other workers were considered the family Pleorchiidae Poche, 1926 for *Pleorchis* (Hafeezullah, 1971; Vicente and Santos, 1973; Gupta and Gupta, 1976; Bilqees, 1977; Gupta and Puri, 1979; Amato, 1983; Shen, 1983; Madhavi and Narasimhulu, 1985; Bray, 1986; Nahhas *et al.*, 1998; Saxena *et al.*, 2010). It was probably due to consideration of other features including, shape of intestine, number and arrangement of testes, and acinated ovary which are peculiar to Pleorchiidae.

Molecular study of Bray *et al.* (2005) conducted on *Pleorchis polyorchis* (Stossich, 1889) and *Pleorchis uku* Yamaguti, 1970 reveals that a clade, comprised of *Zalophotrema hepaticum* Stunkard and Alvey (1929), above *Pleorchis* spp. and *Tormopsolus orientalis* (Yamaguti, 1934), is close to a monophyletic clade of *Stephanostomum* (Acanthocolpidae). But they admitted it less well resolved.

Bartoli *et al.* (2004) and Madhavi and Narasimhulu (1985) were considered the key characters, shape of intestinal caeca, wide variation in number of testes and extension of vitelline follicles, for species separation in *Pleorchis*. In *Pleorchis puriensis* Gupta and Ahmad, 1976 (syn. *Parapleorchis* Al-Yamani and Nahhas, 1981) H-shaped intestine is absent, and it also having some character different to all known species of *Pleorchis*. But despite this, Madhavi and Narasimhulu (1985) and Bray (2005) considered the *P. puriensis* as a synonym of *P. sciaenae* Yamaguti (1938). On above ground *P. puriensis* Gupta and Ahmad, 1976 (syn. *Parapleorchis* Al-Yamani and Nahhas, 1981) seems to be a valid species.

Madhavi and Narasimhulu (1985) and Bray (1986) were considered, *Pleorchis ghanensis* Fischthal and Thomas, 1968, a synonym of *P. sciaenae*. But the study of Bilqees (1977) strongly supports the validity of species *P. ghanensis*. Nahhas *et al.*, (1998) considered the *P. arabicus* Al-Yamani and Nahhas, 1981 a synonym of *P. sciaenae*. The genus *Pleorchis* agrees very well with the description of superfamily Lepocreadioidea (Odhner, 1905) Bray, 2005, particularly in view of

feature 'tegument usually spinous'. Yamaguti (1958) and Bray (2005) have been considered, the number and formation of testes, and status of host as diagnostic criteria for establishing several trematode families. Collectively the characters, intestine usually H-shaped, numerous testes arranged in 2-4 longitudinal rows and an acinous ovary, are only found in the genus *Pleorchis*. Considering all known species of *Pleorchis*, feature "Distomes of marine fishes having numerous testes arranged in 2-4 longitudinal rows" is proposed as the primary diagnostic key for the family Pleorchiidae and genus *Pleorchis*. It is also proposed that the genus *Pleorchis* Railliet, 1896 must be considered as member of superfamily Lepocreadioidea, and family Pleorchiidae Poche, 1926 (syn. Acanthocolpidae (Lühe, 1906; Bray, 2005) with the diagnostic features given here.

On above basis following species (in addition to *P. santoshai* n.sp. and *P. keshavai* n.sp. described here) are still falling within the concept of the genus, and seems valid viz. *P. polyorchis* (Stossich, 1889) Stiles, 1896; *P. americanus* Lühe, 1906; *P. sciaenae* Yamaguti, 1938; *P. californiensis* Manter and Van Cleave, 1951; *P. magnaporus* Arai, 1963; *P. ghanensis* Fischthal and Thomas, 1968; *P. uku* Yamaguti, 1970; *P. mamaevi* Parukhin, 1974; *P. psettodesai* Gupta and Gupta, 1976; *P. puriensis* Gupta and Ahmad, 1976; *P. indicum* Gupta and Puri, 1979; *P. nibeae* Shen, 1983; *P. hainanensis* Shen, 1983; *P. heterorchis* Shaukat and Bilqees, 2006 and *P. srivastavai* Saxena *et al.*, 2010 (see Table I for parasite-host list). Out of these *P. ghanensis*, *P. indicum*, *P. heterorchis*, *P. srivastavai* (in addition to *P. santoshai* n.sp. and *P. keshavai* n.sp.) are without body spines. Whereas, *P. cygnoides* (Zeder, 1800) Stossich, 1898; *Pleorchis mollis* (Leidy, 1856) Stiles, 1896; *P. oligorchis* Johnston (1913) and *P. urocotyle* Parona, 1899 are no longer considered the member of genus *Pleorchis* (see Hanson, 1953; Saxena *et al.*, 2010).

***Pleorchis santoshai*, new species**

(Fig. 1)

Host

Parascorpaena picta (Cuvier) (Scorpaenidae).

Table I.- Check-List of species of *Pleorchis* Railliet, 1896 (Lepocreadioidea: Pleorchiidae).

S.No.	<i>Pleorchis</i> species	Host and locality
1.	<i>P. polyorchis</i> (Stossich, 1889) Stiles, 1896 Syns. <i>Distomum polyorchis</i> Stossich, 1889; <i>Polyorchis polyorchis</i> (Stossich, 1889) Monticelli, 1896.	<i>Corvina nigra</i> (Cuvier) (Sciaenidae), at Triest.
2.	<i>P. americanus</i> Lühe, 1906 Syns. <i>Pleorchis lintoni</i> Yamaguti, 1938; <i>P. mollis</i> (Leidy, 1856) Stiles 1896; <i>Distomum polyorchis</i> (Stossich, 1889) Linton, 1901.	<i>Cynoscion regalis</i> (Bloch and Schneider) (Sciaenidae) from off Woods Hole, USA.
3.	<i>P. sciaenae</i> Yamaguti, 1938 Syn. <i>Pleorchis arabicus</i> Al-Yamani and Nahhas, 1981.	<i>Nibea</i> (= <i>Sciaena</i>) <i>albiflora</i> (Richardson) (Sciaenidae) from the East China Sea.
4.	<i>P. californiensis</i> Manter and Van Cleave, 1951.	<i>Atractoscion</i> (= <i>Cynoscion</i>) <i>nobilis</i> (Ayres) (Sciaenidae) off the US Pacific coast.
5.	<i>P. magnaporus</i> Arai, 1963.	<i>Cynoscion parvipinnis</i> (Ayres) (Sciaenidae) and <i>Urobatis maculatus</i> (probably accidental host) in the Baja California, on the Mexican Pacific coast.
6.	<i>P. ghanensis</i> Fischthal and Thomas, 1968.	<i>Cynoscion macrognahtus</i> (Bleeker) (Sciaenidae) and <i>Pomadasys jubelini</i> (Cuvier) (Haemulidae) off Ghana.
7.	<i>P. uku</i> Yamaguti, 1970.	<i>Aprion virescens</i> (Valenciennes) (Lutjanidae) from off Hawaii.
8.	<i>P. mamaevi</i> Parukhin, 1974.	<i>Ichnius</i> sp. (probable <i>Johnius</i> sp.) in the Red Sea and Indian Ocean.
9.	<i>P. psettodesai</i> Gupta and Gupta, 1976.	<i>Psettodes erumei</i> (Bloch and Schneider) (Psettodidae), from India.
10.	<i>P. puriensis</i> Gupta and Ahmad, 1976 Syn. <i>Parapleorchis</i> Al-Yamani and Nahhas, 1981.	<i>Sciaena vogleri</i> (Bleeker) syn. of <i>Johnius borneensis</i> (Bleeker) Froese and Pauly, 2003 (Sciaenidae), from the Bay of Bengal (India).
11.	<i>P. indicum</i> Gupta and Puri, 1979.	<i>Epinephelus</i> (= <i>Serranus</i>) <i>diacanthus</i> (Valenciennes) (Serranidae), from India.
12.	<i>P. nibeae</i> Shen, 1983.	<i>Nibea albiflora</i> (Richardson) (Sciaenidae), off Hebei, China.
13.	<i>P. hainanensis</i> Shen, 1983.	<i>Pennahia</i> (= <i>Argyrosomus</i>) <i>anea</i> (Bloch) (Sciaenidae), from off Guangdong, China.
14.	<i>P. heterorchis</i> Shaukat and Bilqees, 2006.	<i>Lutjanus johinii</i> (Bloch) (Lutjanidae) and <i>Otolithus argenteus</i> (Cuvier) (Sciaenidae), from Karachi Coast, India.
15.	<i>P. srivastavai</i> Saxena <i>et al.</i> , 2010.	<i>Psettodes erumei</i> (Bloch and Schneider) (Psettodidae), from Deegha Coast, India.
16.	<i>P. santoshai</i> n.sp.	<i>Parascorpaena picta</i> (Cuvier) (Scorpaenidae), from Deegha Coast, India.
17.	<i>P. keshavai</i> n.sp.	<i>Trachynotus botla</i> (Shaw) (Carangidae), from Deegha Coast, India.

Prevalence

Two ovigerous specimens were recovered live out of 20 fishes examined.

Description

Body flat, elongate, spear-shaped and aspinose, rounded anteriorly and truncated posteriorly. Posterior half of body broader than anterior half. Body 4.89-5.42 × 1.02-1.15 mm at level of ventral sucker, 1.21-1.37 mm wide at level of ovary, and with maximum body width of 1.59-

1.82 mm. Forebody 1.29-1.45 mm and hindbody 3.28-3.77 mm long. Oral sucker sub-spherical, ventro-subterminal, 0.15-0.17 × 0.20-0.23 mm. Post-oral muscle ring absent. Prepharynx long, cylindrical, 0.47-0.53 × 0.06-0.07 mm. Pharynx muscular, oval in shape, measuring 0.23-0.26 × 0.19-0.22 mm with conspicuous anterior circular muscle ring. Oesophagus well developed, shorter than prepharynx, measuring 0.20-0.23 × 0.07-0.08 mm. Intestine H-shaped, intestinal bifurcation in forebody, a pair of anterior caecal diverticula

extending well above pharynx up to just behind posterior limit of oral sucker, posterior intestinal caeca reach close to posterior extremity of body with lateral out pocketings along outer margins.

Ventral sucker sub-spherical, pre-equatorial, slightly larger than oral sucker, situated close to caecal bifurcation, measuring $0.22-0.25 \times 0.24-0.27$ mm at 1.39-1.45 mm from anterior extremity *i.e.* almost one-fourth of body length. Excretory vesicle tubular, located between longitudinal rows of testes, excretory pore terminal at posterior notch of body. Genital pore pre-acetabular, close to anterior margin of ventral sucker, at 1.18-1.31 mm from anterior extremity of body. Testes 44 in number in intercaecal space, aligned in 4 parallel rows, 2 ventral and 2 dorsal having 11 testes in each row. Testes sub-globular, entire with anterior testes slightly larger than posterior, extend immediately from behind the ovary, anterior most testis measures $0.21-0.25 \times 0.28-0.34$ mm, and posterior most testis measures $0.16-0.18 \times 0.24-0.27$ mm.

Cirrus-sac claviform, elongated, overlaps dextral side of ventral sucker, extends midway between ventral sucker and ovary. It is, curved, broader posteriorly, and contains bipartite seminal vesicle, small pars-prostatica and long ejaculatory duct. Seminal vesicle spherical, proximal seminal vesicle dorsal and slightly larger than distal which is antero-ventral. Cirrus sac $0.74-0.85 \times 0.21-0.24$ mm, proximal seminal vesicle measures $0.16-0.18 \times 0.18-0.21$ mm, and distal seminal vesicle $0.13-0.16 \times 0.15-0.17$ mm. Pars-prostatica $0.11-0.13 \times 0.09-0.10$ mm. Ejaculatory duct opens into genital atrium. Genital pore small, at 1.18-1.31 mm from anterior extremity of body, median, post-caecal bifurcation, pre-acetabular and separated from anterior margin of ventral sucker. Space around vesicula seminalis and pars-prostatica surrounded by large number of prostate gland cells. Ovary acinous, deeply multilobed, with about 12 lobes, median, pre-testicular, wider than long, anterior to midbody, measuring $0.32-0.37 \times 0.56-0.65$ mm, at level of 2.07-2.30 mm from anterior extremity.

Vitellaria follicular, extending from anterior margin of ventral sucker upto posterior end of body and to lateral body margins, confluent in post-testicular space. Anterior body extremity to anterior limit of vitellarium 1.29-1.44 mm.

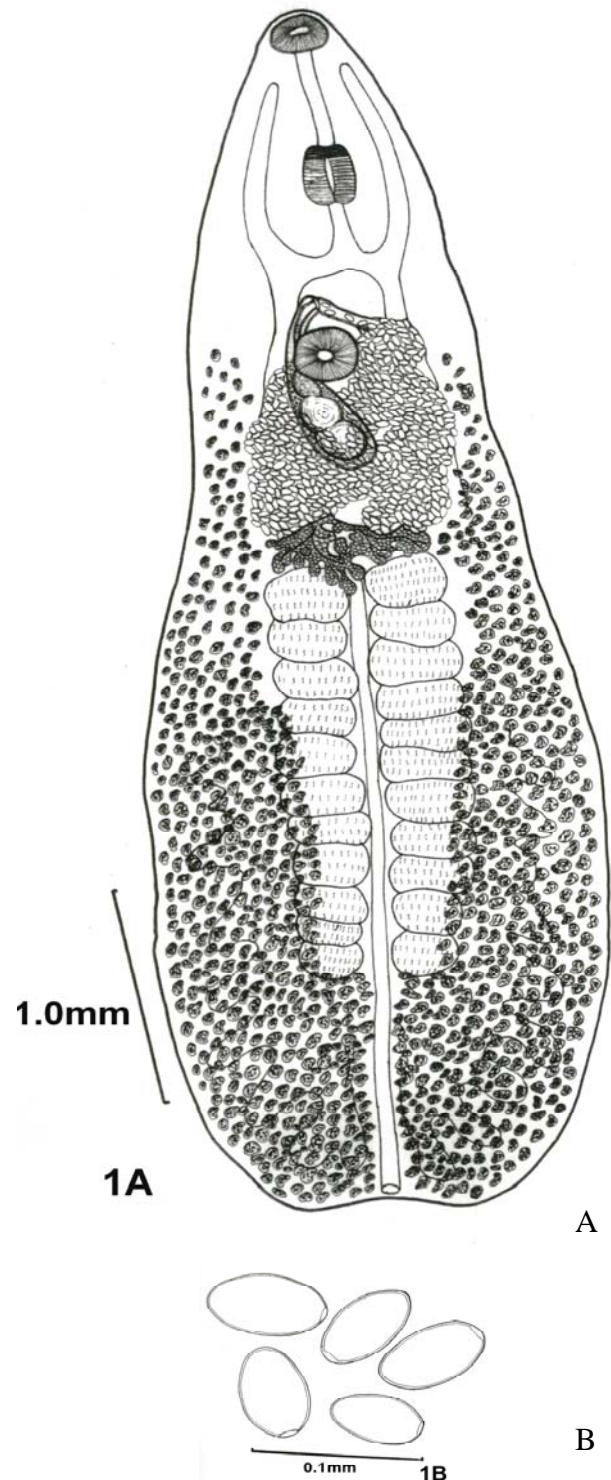


Fig 1. *Pleorchis santoshai*, new species; A, entire specimen (ventral view); B, eggs.

Canalicular seminal receptacle absent. Uterine seminal receptacle large. Uterus pre-ovarian, uterine coils fills the space between ovary and ventral sucker, metaterm tubular, slightly narrow, opens into genital atrium.

Eggs numerous, ovoid, thin shelled, operculated, usually collapsed in mounted specimens, golden yellowish, different in size, measure 0.055-0.065 × 0.030-0.040 mm (measurements of intact eggs).

Remarks

The present form is referred to the genus *Pleorchis* Railliet, 1896. *Pleorchis santoshai* n.sp. differs from all known species of genus in having long anterior caecal diverticula extending well above level of pharynx and reach up to just behind posterior margin of oral sucker. It further differs from all known species of *Pleorchis* except *P. ghanensis*, *P. indicum*, *P. heterorchis*, *P. srivastavai* (in addition to *P. keshavai* n.sp.) in absence of body spines. Present form differs from all known species of *Pleorchis* except *P. polyorchis*, *P. sciaenae*, *P. magnaporus*, *P. ghanensis*, *P. psettodesai*, *P. puriensis*, *P. indicum*, *P. hainanensis* and *P. heterorchis* in having 44 testes. Present form further differs from *P. polyorchis*, *P. sciaenae*, *P. ghanensis* and *P. psettodesai* in having well developed oesophagus. It differs from *P. polyorchis*, *P. puriensis*, *P. indicum*, *P. heterorchis* and *P. srivastavai* in extension of vitelline field from anterior margin of ventral sucker to the posterior end of body. The present form differs from type species *P. polyorchis* in having a cirrus-sac extending further in to the hindbody and containing a large proximal part of the seminal vesicle and a smaller distal one. It differs from *P. sciaenae* in comparatively shorter length of hindbody in relation to size of the forebody. It differs from *P. magnaporus* in having pharynx with well developed anterior circular muscle ring and intestinal caeca reach up to posterior extremity of body. Present form differs from *P. puriensis*, *P. indicum*, *P. heterorchis* and *P. srivastavai* in having posteriorly directed intestinal caeca with lateral outpocketings. It further differs from *P. srivastavai* in having a multilobed ovary. *Pleorchis santoshai* n.sp. differs from *P. polyorchis*, *P. sciaenae*, *P. magnaporus* and

P. hainanensis in absence of post-oral muscle ring. Accordingly the present form deserves the status of new species with the specific name *P. santoshai* new species.

The new species is named in honour of Late Dr. (Mrs.) Santosh Kumari Saxena, Helminthologist, Department of Zoology, University of Lucknow, Lucknow, India.

Pleorchis keshavai, new species

(Fig. 2)

Host

Trachynotus botla (Shaw) (Carangidae).

Prevalence

Three ovigerous specimens were recovered live out of 30 fishes examined.

Description

Body flat, elongate and aspinose, body slightly tapered anteriorly and with rounded anterior extremity and more or less truncated and broader posteriorly. Body 4.80-6.09 × 0.98-1.38 mm at level of ventral sucker, 1.21-1.77 mm wide at level of ovary, and with maximum body width of 1.51-2.06 mm. Forebody 1.11-1.45 mm and hindbody 3.41-4.38 mm long. Oral sucker sub-spherical, ventro-subterminal, 0.18-0.33 mm × 0.23-0.35 mm. Post-oral muscle ring absent. Prepharynx well developed, cylindrical, 0.47-0.55 mm long and 0.07-0.11 mm wide. Pharynx muscular, ovoid, measuring 0.21-0.25 mm × 0.19-0.27 mm with conspicuous anterior circular muscle ring. Oesophagus shorter than prepharynx, 0.19-0.20 × 0.08-0.11 mm. Intestine H-shaped, intestinal bifurcation in forebody, a pair of anterior caecal diverticula extending as far as anterior limit of pharynx, posterior intestinal caeca reach close to posterior extremity of body with lateral out pocketings along outer margins.

Ventral sucker sub-spherical, pre-equatorial, smaller than oral sucker, situated close to caecal bifurcation, measuring 0.24-0.25 × 0.20-0.29 mm, at 1.11-1.45 mm from anterior extremity *i.e.* about one-fourth of body length. Excretory vesicle tubular, located between longitudinal rows of testes, excretory pore terminal at posterior notch of body. Genital pore immediately pre-acetabular, close to

anterior margin of ventral sucker, at 1.04-1.33 mm from anterior extremity of body. Testes 44 in number in intercaecal space, aligned in 4 parallel rows, 2 ventral and 2 dorsal having 11 testes in each row. Testes sub-globular, entire with anterior testes slightly larger than posterior, extend immediately from behind the ovary, anterior most testis measures $0.20-0.33 \times 0.23-0.48$ mm, and posterior most testis measures $0.13-0.22 \times 0.19-0.21$ mm.

Cirrus-sac claviform, overlaps dextral side of ventral sucker, extends midway between ventral sucker and ovary. It is, curved, broader posteriorly, and contains bipartite seminal vesicle, pars-prostatica and ejaculatory duct. Seminal vesicle spherical, proximal seminal vesicle dorsal and larger than distal which is antero-ventral. Cirrus sac $0.72-0.76 \times 0.19-0.21$ mm, proximal seminal vesicle measures $0.15-0.16 \times 0.15-0.24$ mm, and distal seminal vesicle $0.12-0.13 \times 0.13-0.19$ mm. Pars-prostatica $0.10-0.13 \times 0.06-0.08$ mm. Ejaculatory duct opens into genital atrium. Genital atrium spherical and wide. Genital pore small, at 1.04-1.33 mm from anterior extremity of body, median, post-caecal bifurcation, pre-acetabular and slightly separated from anterior margin of ventral sucker. Space around vesicular seminalis and pars-prostatica surrounded by large number of prostate gland cells. Ovary acinous, multilobed with about 10 lobes, median, pre-testicular, wider than long, well anterior to midbody, $0.34-0.43 \times 0.56-0.98$ mm, at 1.89-2.32 mm from anterior extremity.

Vitellaria follicular, extending from mid level of ventral sucker up to posterior end of body and to lateral body margins, confluent in post-testicular space, never reach to anterior margin of ventral sucker. Anterior body extremity to anterior limit of vitellarium 1.23-1.61 mm.

Canalicular seminal receptacle absent. Uterine seminal receptacle large. Uterus pre-ovarian, intercaecal, uterine coils fills the space between ovary and ventral sucker, metaterm tubular, wide and opens into genital atrium.

Eggs numerous, ovoid, thin shelled, operculated, usually collapsed in mounted specimens, golden yellowish, different in size, measure $0.055-0.070 \times 0.035-0.045$ mm (measurements of intact eggs).

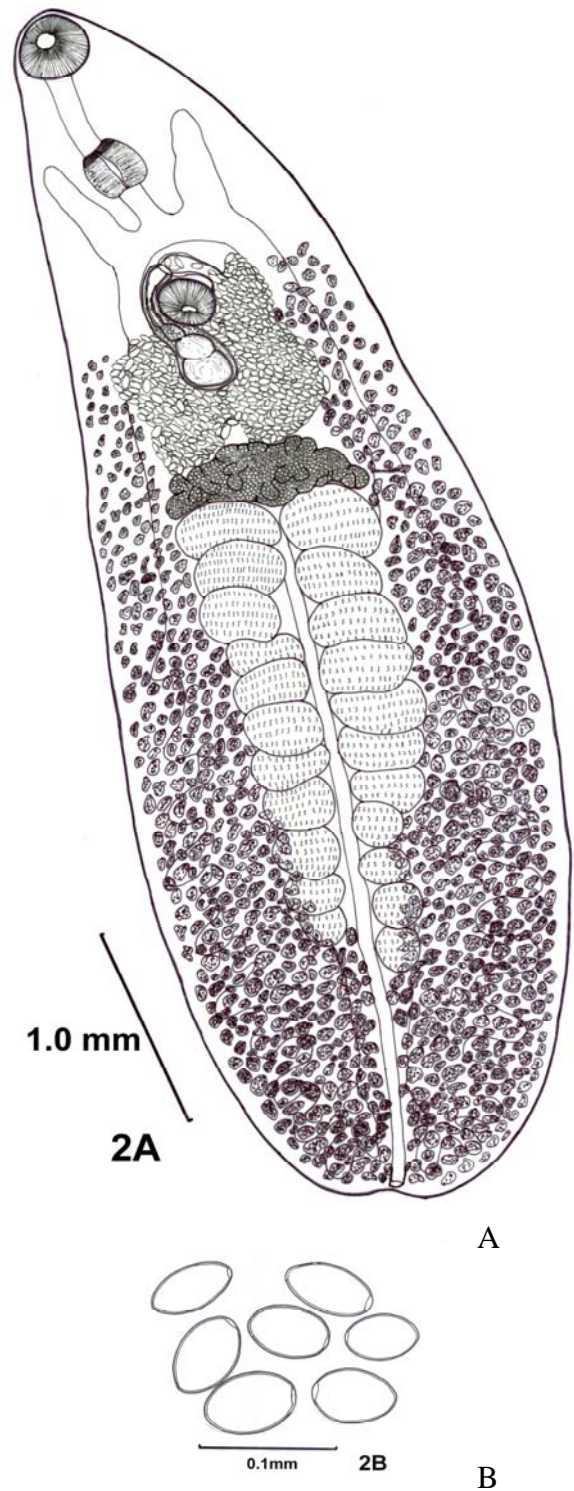


Fig 2. *Pleorchis keshavai*, new species; A, entire specimen (ventral view); B, eggs.

Remarks

The present form is referred to the genus *Pleorchis* Railliet, 1896. *Pleorchis keshavai* n.sp. differs from all known species of *Pleorchis* except *P. ghanensis*, *P. indicum*, *P. heterorchis*, *P. srivastavai* and *Pleorchis santoshai* n.sp. in absence of body spines. Present form differs from all known species of *Pleorchis* except *P. polyorchis*, *P. sciaenae*, *P. magnaporus*, *P. ghanensis*, *P. psettodesai*, *P. puriensis*, *P. indicum*, *P. hainanensis*, *P. heterorchis* and *Pleorchis santoshai* n.sp. in having 44 testes. Present form further differs from *P. polyorchis*, *P. sciaenae*, *P. ghanensis* and *P. psettodesai* in having well developed oesophagus. It differs from *P. polyorchis*, *P. sciaenae*, *P. psettodesai*, *P. puriensis*, *P. ghanensis*, *P. heterorchis*, *P. srivastavai* and *Pleorchis santoshai* n.sp. in extension of vitelline field from mid level of ventral sucker to the posterior end of body. It further differs from type species *P. polyorchis* in having a cirrus-sac extending further in to the hindbody and containing a large proximal part of the seminal vesicle and a smaller distal one. The present form differs from *P. sciaenae* in comparatively shorter length of hindbody in relation to size of the forebody. It differs from *P. magnaporus* in having pharynx with well developed anterior circular muscle ring and intestinal caeca reach up to posterior extremity of body. Present form differs from *P. puriensis*, *P. indicum*, *P. heterorchis* and *P. srivastavai* in having posteriorly directed intestinal caeca with lateral outpocketings. It further differs from *P. srivastavai* in having a multilobed ovary. *Pleorchis keshavai* n.sp. differs from *P. polyorchis*, *P. sciaenae*, *P. magnaporus* and *P. hainanensis* in absence of post-oral muscle ring. Accordingly the present form deserves the status of new species with the specific name *Pleorchis keshavai* new species.

The new species is named in honour of Prof. Keshava C. Pandey, Eminent Helminthologist, Department of Zoology, University of Lucknow, Lucknow, India.

DIAGNOSTIC CHARACTERS FOR FAMILY
PLEORCHIIDAE POCHE, 1926 AND GENUS
PLEORCHIS RAILLIET, 1896

Rare digenetic distomes, intestinal parasites

in marine fishes; cosmopolitan. Body dorso-ventrally flattened, with or without spines, oval to elongate or spear-shaped. Oral sucker rounded or sub-spherical, ventrally terminal or sub-terminal, followed by well developed prepharynx. Post-oral muscle ring present or absent. Ventral sucker rounded or sub-spherical, generally smaller than oral sucker, pre-equatorial, behind caecal bifurcation. Pharynx large, oval to pyriform, with or without anterior circular muscle ring. Oesophagus smaller than prepharynx, sometimes indistinct or absent. Intestine usually H-shaped. Anteriorly directed caecal diverticula if present, equal or unequal. Intestinal caeca usually reach to posterior extremity, blind, with or without small lateral outpocketings on outer margin. Testes numerous, sub-globular, arranged in two or four longitudinal rows in intercaecal space of hindbody, vary in size. Cirrus sac claviform, curved, extend into hindbody. Cirrus sac having internal bipartite seminal vesicle, short pars-prostatica, and an unarmed ejaculatory duct. Distal part of seminal vesicle larger than proximal part or *vice-versa*. Genital atrium tubular, genital pore median, and pre-acetabular. Metaterm weakly developed. Uterine seminal receptacle present. Uterus coiled and pre-ovarian. Ovary acinous, pre-testicular, entire, oval or multilobed, in anterior hindbody. Eggs numerous operculated, vary in size. Vitelline follicles extend in to forebody or not. Excretory vesicle I-shaped, located between longitudinal rows of testes, reach ovary. Family Pleorchiidae Poche, 1926 including only one genus *Pleorchis* Railliet, 1896 with type species *P. polyorchis* (Stossich, 1889) Stiles, 1896.

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