



A NEW TREMATODE PARASITE BELONGING TO GENUS *ALLOCREADIUM* LOOSS, 1900 FROM A NEW HOST FISH *TOR* *PUTITORA* FROM POONCH RIVER OF J&K STATE, INDIA

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ABSTRACT

Freshwater fish *Tor putitora* from Poonch River were scanned for a period of two years from Dec. 2006 to Nov. 2008 on monthly basis for recovery of metazoan parasitic infection. The study revealed the presence of digenean trematode belonging to genus *Allocreadium* Looss, 1900 in the intestine of fish *Tor putitora*.

KEYWORD: Digenean trematode, *Allocreadium*, Fresh water fish *Tor putitora*, Poonch river.

INTRODUCTION

Allocreadium tori n. sp.

The genus *Allocreadium*, was erected by Looss in 1900, with *Allocreadium isoporum* as type species, to accommodate a trematode parasite in the intestine of a fresh water fish from Egypt which was described by him earlier (Looss, 1894) as *Distomum isoporum*. In 1903 Stossich created the family *Allocreadiidae* for placing this newly created genus. Over the period, a number of forms came to be placed under this family, till Stunkard in 1932 on the basis of his studies on the cercarial morphology of the forms included under the family, expressed the opinion that the different taxa within the family did not constitute a natural group and therefore warranted a thorough systematic reinvestigation. A similar view was independently held by Cable (1956) who reviewed the problem in detail and pointed out that the genera included in *Allocreadium* constitute a polyphyletic complex and therefore, deserved a careful morphological re-analysis. As a consequence of his studies on different genera under the family *Allocreadiidae*, Dawes (1968) divided the family into four sub families, namely; *Lapocreadiinae*, *Stephanophialinae*, *Sphaerostomatinae* and *Allocreadiinae*, and in the sub-family *Allocreadiinae*, included 6 genera, namely, *Allocreadium*, *Plagioporus*, *Podocotyle*, *Helicometra*, *Peracreadium* and *Cainocreadium*. Under the genus *Allocreadium*, Skrjabin and Koval (1966) created the super family *Allocreadiodea* under which they placed seven families including *Allocreadiidae*. Yamaguti (1971) divided the genus *Allocreadium* into three subgenera namely: *Allocreadium*, *Allocreadioides* and *Neoalloeacreadium*. Literature reveals that different workers (Fotedar & Dhar, 1974; Sudan, 1979, Kalyankar & Deshmukh, 1980; Dhar & Kharoo, 1984, Singh, 1997) have discussed *Allocreadium* from different hosts from different localities of India as well as Jammu & Kashmir. *Allocreadium* recorded and discussed presently was recovered from fresh water fish *Tor putitora* from Poonch river of J&K state which is first host record of the genus from the state.

MATERIALS & METHODS

Fresh water fish *Tor putitora* were caught on monthly basis from Poonch river in district Poonch of J&K State from Dec. 2006 to Nov. 2008 and evaluated for recovery of parasites following procedure given by Moravec et. al. (1997).

Adult flukes obtained were flattened, fixed in 70% ethanol, stained in borax carmine and mounted in DPX. Drawing was made with the aid of camera lucida. Measurements are given in millimeters unless otherwise stated. The type and voucher specimens have been deposited in the museum of Zoology dept., University of Jammu, Jammu, J&K State, India.

Descriptive notes

Allocreadium tori n. sp.

Family: *Allocreadiidae* (Looss, 1902) Stossich, 1903.

Subfamily: *Allocreadiinae* Looss, 1902.

Descriptive note: Based on four randomly selected specimens of the parasite (Fig. 1 - 10, Table 1 & 2).

Body: elongated, 2.58 long lanceolate, aspinose, with rounded extremities, attaining maximum breadth, 0.60mm at post ovarian level between ovary and anterior testis (Fig. 1 & 2). Oral sucker: terminal, subspherical transversely placed (0.20 x 0.22 in diameter). Mouth: ventral, prepharynx: present, pharynx: globular and muscular, well developed (Fig. 6, 7), oesophagus: not visible, concealed behind the uterus and eggs, intestinal caeca: overcrowded by the dense vitellaria in the lateral and posterior zones in mature specimens, terminating close to posterior extremity, but not actually reaching it (Fig.3, 10, 11). Acetabulum: pre-equatorial, globular, post bifurcal, slightly smaller than oral sucker (0.17 x 0.18 in diameter) in anterior third of the body (Fig. 1, 2, 5).

Testes: entire, nearly oval, tandem and located in the lower half of the body, anterior testis measures (0.26 x 0.18) slightly smaller than the posterior one (0.27 x 0.19) (Fig.1,2,3). Seminal vesicle: adacetabular towards right side (Fig.1, 8). Genital pore located on left side of the body at the level of intestinal bifurcation.

Ovary: nearly spherical (0.15 x 0.11mm in size) situated slightly towards left from the middle (Fig. 1, 4, 5). Vitellaria; follicular, follicles numerous, small in size extending from middle of acetabulum to the posterior extremity, covering the entire post testicular area, in pre-testicular area they lie on the flanks leaving the middle for the uterus. Uterus spreads between the genital pore and the

posterior end of the anterior testis, restricting its coils in the middle region of the body. Eggs: large sized (0.09 x 0.06) μ , yellowish in colour and oval in shaped {(Fig.1, 2, 4, 5, 9) (Table 1, 2)}.

Host : *Tor putitora* (Hamilton)

Location: Intestine

Locality : Poonch river (station I)

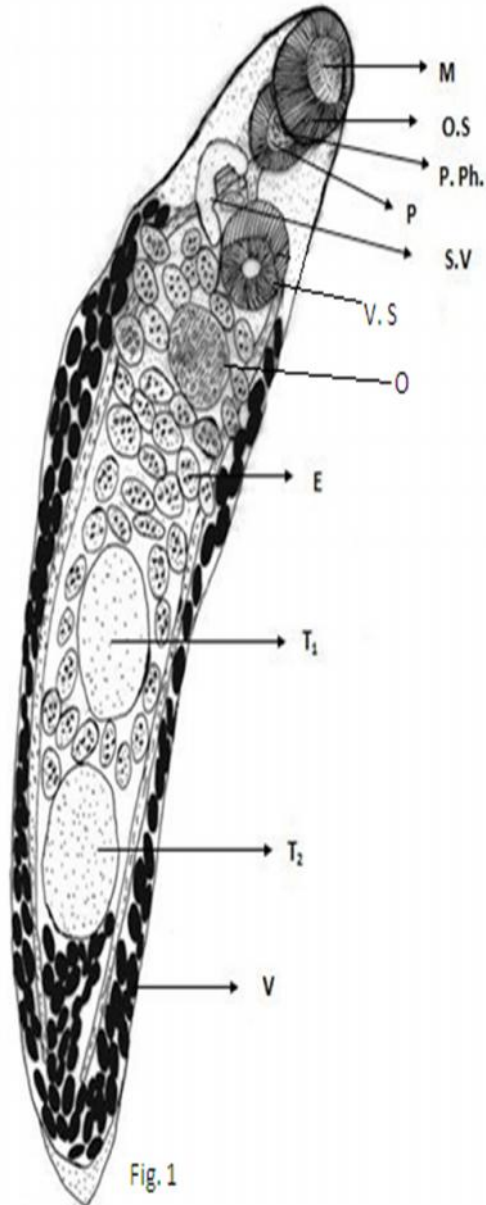


FIGURE 1. Camera lucida of *Allocreadium tori* n.sp. Entire (ventral view)

M- Mouth, O.S.- Oral Sucker ; P. Ph- Pre Pharynx ; P- Pharynx ; S.V. Seminal vesicle A-Acetabulum ; O- Ovary ; E- Eggs ; T1- Anterior testis ; T2- posterior testis, V-



FIGURE 2- Micro photograph –entire (ventral view)



FIGURE 3- Posterior part showing ant. and post. testis and terminal part of intestinal caecae.

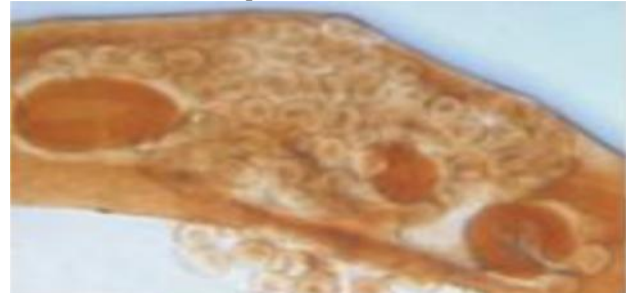


FIGURE 4- Middle part showing ventral sucker, ovary, eggs and anterior testis



FIGURE 5: Anterior part showing oral sucker, ventral sucker, ovary and eggs.

FIGURE 2–5 Microphotographs of *Allocreadium tori* n.sp.

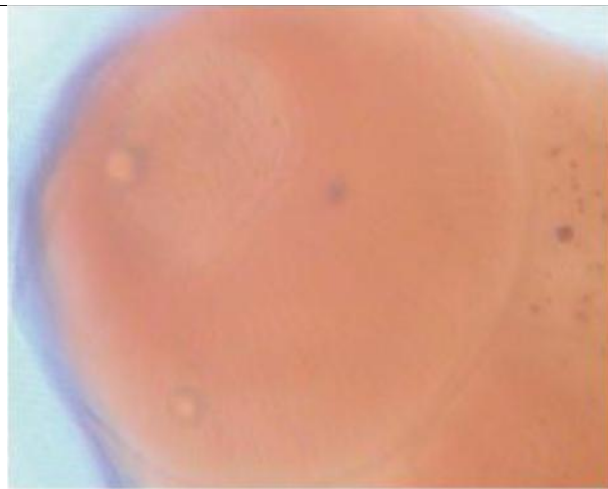


FIGURE 6- Showing oral sucker

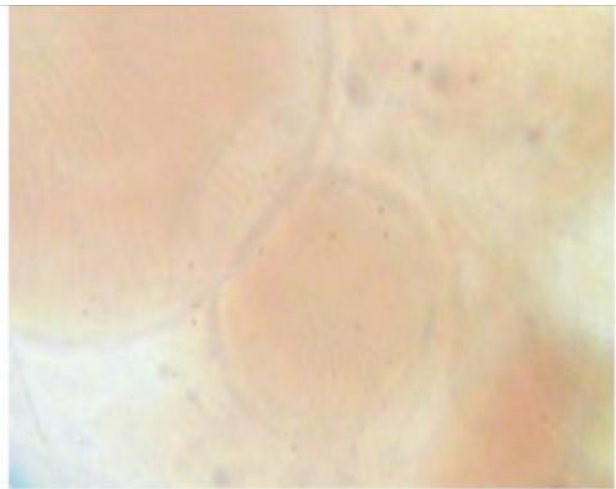


FIGURE 7- Showing oral sucker, prepharynx and pharynx



FIGURE 8- Showing seminal vesicle.

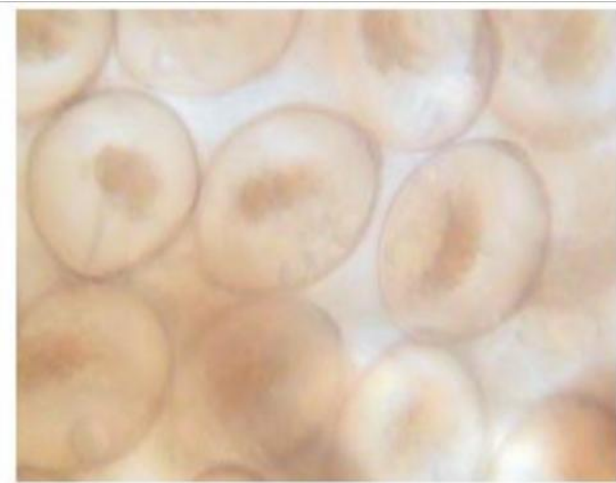


FIGURE 9- Showing eggs



FIGURE 10- showing terminal end of intestinal caecae



FIGURE 11- Showing terminal end of intestinal caecae

FIGURE 6 – 11 Microphotographs of *Allocreadium tori* n.sp.TABLE 1: Morphometric Data of *Allocreadium tori* n.sp. collected from *Tor putitora* from station I.

Morphological feature	Measurements (mm)
Mean body size	Small - 1.93 x 0.52 ± 0.1
Prepharynx	Present
Oro-acetabular sucker	Bigger than acetabulum
Size ratio	(0.20 x 0.22) :(0.17 x 0.18)
Vesicula seminalis	Indistinct
Egg no. & size (μ)	small numerous- 90.1 x 60.2 ± 3.6 x 2.06
Shape of egg	oval
Host	<i>Tor putitora</i>

DISCUSSION

The trematode parasite obtained from the alimentary canal of fish *Tor putitora* described above is assigned to the family Allocreadiidae (Looss, 1902) Stossich, 1903 because of (1) well developed pharynx (ii) Aspinose body, (iii) Pre-equatorial acetabulum (iv) pre-acetabular post furcal genital pore (v) pre-testicular post acetabular ovary

(vi) post-acetabular location of the vitellaria on the basis of their following characters, viz.,(i) a fusiform body (ii) a subterminal oral sucker (iii) long intestinal caeca (iv) uterus restricted to acetabulo-testicular zone and (v) absence of external vesicular seminalis, these worms are further assigned to the sub family Allocreadiinae Looss, 1902.

TABLE 2: Morphological differences between the different species of genus *Allocreadium*

Morphological feature	<i>A. gachuai</i> Singh 1997	<i>A. handiai</i> Pande, 1937b	<i>A. kawi</i> Sudan, 1979	<i>A. cyprini</i> Sudan, 1979	<i>A. putitori</i> present author	Present Author
Mean body size	Small 2.44x 0.54	Large 5.46 x 1.1	Small 2.58 c 0.60	Small 4.46 x 0.82	Large 4.6 x 0.98	Small 1.93 x 0.52 ± .1
Prepharynx	Absent	Absent	Present	Present	Present	Present
Oro-acetabular sucker	Bigger than acetabulum	Bigger than acetabulum	Smaller than acetabulum	Smaller than acetabulum	Smaller than acetabulum	Bigger than acetabulum
Size ratio	(0.24 x 0.26) (0.20 x 0.20)		(0.26 x 0.28) (0.28 x 0.29)	(0.40 x 0.40) (0.40 x 0.40)	(0.34 x 0.32) : (6.47 x 0.45)	(0.20 x 0.22) : (0.17 x 0.18)
Vesicula seminalis	Unipartite	Bipartite	Unipartite	Unipartite	Unipartite	Indistinct
Egg no. & size (µ)	Few 118.5 x 83.25	Few (117-125) x (84-100)	nemerosus 82 x 40	small & few 90 x 57	small & numerous 80x60	Small & numerous 90.1 x 60.2 ± 3.6
Shape of egg	boat shaped		boat shaped	oval	boat shaped	oval
Host	<i>Channa gachua</i>	<i>Channa gachua</i>	<i>Channa gachua</i>	<i>Cyprinus carpio</i>	<i>Tor putitora</i>	<i>Tor putitora</i>

Of the 4 genera namely *Austrocreadium*, *Polylekthum*, *Pseudoallocreadium* and *Allocreadium* placed under the subfamily by Yamaguti (1971), the worm described presently falls under the genus *Allocreadium* Looss, 1900 because in these worms also (i) the vitellaria are spread mostly in the hind body extending only a little into the forebody and (ii) presence of non appendiculate sucker. Under genus *Allocreadium* as already stated Yamaguti (1971) listed 27 species from different fishes from world over, of which fifteen are reported parasitic in the gut of some freshwater fishes of India (Table 2). Subsequent to Yamaguti's list of species under *Allocreadium*, six more species were added under *Allocreadium* from different fishes, viz. *A. kashmirensis* Fotedar and Dhar, 1974, *A. cyprini* & *A. Kawi* Sudan, 1979, *A. indicum* Kalyankar and Deshmukh, 1980, *A. fotedari* Dhar and Kharoo, 1984 and *A. gachuai* Singh, 1997. It is also evident from this table-2 that no species of *Allocreadium* has so far been described from the fish *tor putitora*. In present investigation the form described above stand morphometrically distinct from rest of the known species of the region. The present form differs morphometrically (Table 4) from *A. gachuai* in (i) having a relatively smaller body size (ii) presence of prepharynx which is absent in *A. gachuai* (iii) having large sized oval shaped eggs which are smaller and boat shaped in *A. gachuai*. From *A. handiai*, Pande, 1937b, the present form differs in (i) having much smaller size of body (1.93 x 0.52) as compared to *A. handiai* (5.46 x 1.1mm) and (ii) having large sized oval eggs which contain yolk granules. Striking differences of the present form have also been observed from that of *A. kawi*, Sudan, 1979, such as (i) smaller size of body 1.93 x 0.52 against 2.58 x 0.60 (ii) oral sucker bigger than acetabulum which in case of *A.kawi* is smaller than acetabulum (iii) oval shaped large sized eggs which are boat shaped and small sized in *A. kawi*. The present form differs from *A.cyprini* with reference to (i) small body size 1.93 x 0.52 against 4.46 x

0.82mm of *A. cyprini* (ii) oral sucker larger than acetabulum, which in case of *A.cyprini* is smaller than acetabulum (iii) the eggs in present form are oval to sub-circular in shape and large in size which in *A. cyprini* are oval, small in size and few in number. From *A. kashmirensis*, the difference lies in the extension of the vitellaria from close behind the acetabulum to the end of the body in the present case, which in *A.kashmirensis* extend from the oral sucker to the end of the body. The form under discussion shows clear differences from *A.putitori*, which has been discussed elsewhere with reference to (i) length and width of body (1.93 x 0.52mm) against (4.6 x 0.98mm) (ii) Oral sucker bigger than acetabulum which in *A. putitori* is smaller than acetabulum (iii) size and shape of eggs which are large in size and subcircular in shape in present form but small in size and boat shaped in *A. putitori*. In view of the above mentioned differences together with the difference of host species (*Tor putitora*) from where the present parasite is collected, it is felt that the present worm may be treated as new to the science and is therefore, described here as a new species *Allocreadium tori*. The suggested species name is after the name of genus of the host from where the present form is described for the first time from J&K state and India.

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