



A NEW SPECIES OF TREMATODE PARASITE, *ALLOCREADIUM KHAMI* N.SP. FROM FRESHWATER FISH, *MASTACEMBELUS ARMATUS*, AURANGABAD DISTRICT, INDIA

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Abstract: The present new trematode parasite, *Allocreadium khami* n.sp. were collected from liver of freshwater fish, *Mastacembelus armatus* (Lecepede, 1800) Kham river, Aurangabad district, India. The new species *A. khami* differ from other known species of genus *Allocreadium* in having distinct characters viz, shape and size of the body; shape, size and arrangement of suckers, position and sizes of reproductive organs.

Keywords: Trematode parasite, *Allocreadium khami* n.sp., *Mastacembelus armatus*, Aurangabad.

I. INTRODUCTION

Allocreadium was erected by Looss in (1900) with *A. isoporum* as its species. Large number of species of genus *Allocreadium* reported from different part of world.

Following species placed in the genus *Allocreadium* by Stossich (1900) such as *A. pegorchia* Stoss., *A. obovatum* (Molin) and *A. asymphyloporum* Stoss. The genus *Allocreadium* revised by Odhner in (1901) and placing the following species *A. fascinatium* (Rud.), *A. labri* (Stoss.). Later, described a new species *A. lobatum* by Wallin E. Ivan in (1909) from the host, *Semotilus bullaris*.

Pande (1937) was made the first record of the genus *Allocreadium* in India from freshwater fishes and described a new species *A. handiai* from *Ophiocephalus punctatus*, Lucknow. Later, Kaw (1950) described a new species *A. nemacheilus* from *Nemacheilus kashmirensis*. Gupta (1950) described a new species *A. thapari* from freshwater fish, *Rita-rita*. Gupta (1956) described two more new species *A. mehrai* and *A. kamlai* from *Rhynchobdella aculeate* and *Chela bacaila* respectively.

Srivastava (1960) added one more new species *A. ophiocephali* from the host, *Ophiocephalus punctatus*. Rai (1962) has described three species *A. dollfusi*; *A. singhi* and *A. hirnai* all from the host *Barbus tor*. Later, added a new species *A. makundi* from *Barbus saranam* by Gupta in (1963). Agarwal (1964) reported a new species *A. heteropneustus* from host, *Heteropneustes fossilis*.

In (1966) Mehra, revised the classification of *Allocreadidea* Nicoll (1934) and recognized the following valid species under the genus *Allocreadium* namely *A. handiai* Pande, 1937 syn. of *A. thapari* Gupta, 1950; *A. ophiocephali* Srivastava, 1960; *A. nemachilus* Kaw, 1950; *A. mehrai* Gupta, 1956 and *A. kamlai* Gupta, 1956.

Kakaji (1969) considered following valid species in *Allocreadium* genus i.e., *A. handiai* Pande (1937), *A. thapari* Gupta (1950), *A. mehrai* Gupta (1956), *A. singhi* Rai (1962), *A. heteropneustus* Agarwal (1964), *A. dollfusi* Rai (1962), *A. hirnai* Rai (1962), *A. nemachilus* Kaw (1950), *A. makundi* Gupta (1963) and *A. kamlai* Gupta (1956).

Rai (1970) agreed with Mehra (1966) and redescribed species *A. mehrai* Gupta (1956) and *A. handiai* Pande (1937) from freshwater fishes. Thomas J.D. (1972) described a species *A. ghanensis* from rectum of *Synodontis sp.* (Mochocidae) in Ghana. Gupta and Verma (1976 publ. 1977) described three more new species such as *A. mrigali*, *A. saranai* and *A. baranai* from the host, *Cirrhina mrigala*, *Barbus sarana* and *Barilius barna* respectively. Anatomy of the female reproductive system in *A. ophiocephali* (Srivastava, 1960) described by Madhavi and Hanumantha Rao (1977). Later, Madhavi in (1978) worked out the life history of *A. fasciatusi* Kakaji (1969) from freshwater fish, *Aplocheilus malastigma* and observed in the size of egg, shape of excretory bladder, structure of seminal vesicle and presence of eye spot.

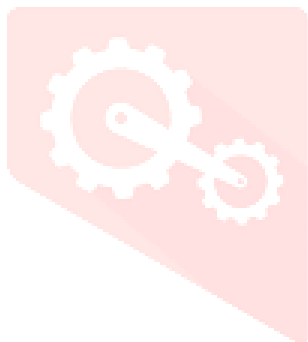
Bhadauri (1984) described two new species *A. gwaliorensis* and *A. tigarai* from the intestine of freshwater fish, *Mystus vittatus* and *Channa punctatus* respectively. Later, Shimazu (1988) described a species *A. tosai* from the *Morcopercnurua sachalinensis* (cyprinidae) in Kushiro. Then added a species *A. gotoi* (Hasegawa and Ozaki 1926) comb.n. Shimazu in (1988) from the intestine of *Misgurnus anguolocaudatum* in Oshima.

Later, Ernest et al. (1993) described new species *A. lucyae* from bandfin shiner, *Notropis zonistius* in Illinois. Takeshi et al. (2000) added a species *A. patagonicum* from the intestine of *Percichthys colhuapiensis* in Argentina. Takeshi Shimazu (2003) described two more species such as, *A. shinanoense* and *A. aburahaya* from intestine of *Phoxins lagowskii steindacheri sauvage* in Japan.

The present communication deals with description of new species *Allocreadium khami* n.sp. from the *Mastacembelus armatus* Lecepede (1800).

II. RESEARCH METHODOLOGY

Freshwater fish, *Mastacembelus armatus* Lecepede (1800) were collected from Kham river, Aurangabad district (M.S.), India. Trematode were collected from the liver of fish, *Mastacembelus armaus*. Washed in distilled water, fixed in 4% formalin, stained with Harri's Haematoxylene, dehydrated in alcoholic grades, cleared in xylene, mounted in DPX. Drawings were made with the help of Camera Lucida and all the measurement are taken in millimeter, identification was carries out by the using Systems Helminthum trematode Vol-I & II Yamaguti (1971).



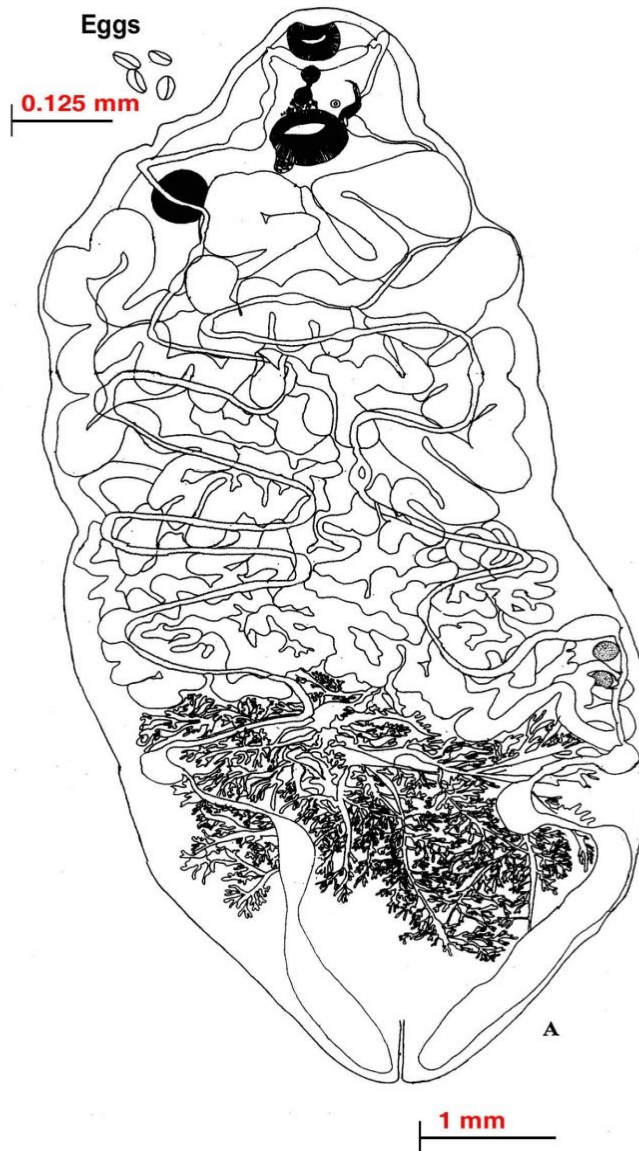


Fig. 1) *Allocreadium khami* n.sp. & eggs

III. RESULTS

Description:

The trematode worms were large, dorso ventrally flattened, reddish in colour. The entire length of worm measures 24.8213 mm. in length and 10.6249 mm. in breadth. The oral sucker is rounded, sub terminal, it measures 3.2857 mm. in diameter. Pharynx is oval and attached posterior side of the oral sucker, oesophagus not visible. Ventral sucker oval, larger than oral sucker below the cirrus pouch and gonopore it measures 1.6607 mm. in length and 1.3392 mm. in breadth. Intestinal caeca elongated, bifurcate, bulging, overlap to ovary and uterus and posterior extremity. Gonopore small, rounded above ventral sucker.

Male reproductive organ, cirrus pouch is well developed, elongated, spoon like and located side or above ventral sucker and overlapping to the intestinal caeca, it measures 1.9464 mm. in diameter. Cirrus is long tube like; anterior of the genital opening and it measures 0.2678 mm. in length and 0.05357 mm. in breadth. Genital opening is oval and it measures 0.07142 mm. in length and 0.05357 mm. in breadth. Ejaculatory duct is tubular at the anterior end of the pars prostatica and measures 0.2857 mm. in length and 0.03571 mm. in breadth. Pars prostatica cells enclosed by thin walled of the cirrus pouch. Pars prostatica is tube like, zigzag manner and opens into the seminal vesicle. Vesicula seminalis oval, bipartite, it measures 0.1954 mm. in length and 0.1071 mm. in breadth. Testes are two, circular at the posterior side of the body. Anterior testes free from the uterus and measures 1.5178 mm. in diameter.

Female reproductive system, uterus is large or much coiled, broad and overlaps to the ventral sucker and posterior testes. Ovary is longitudinally slightly oval, large and it measures 1.3121 mm. in length and 1.010 mm. in breadth. Vitellaria are confluent or branched like at the posterior region of the body. Excretory bladder is tubular (**fig.1**).

Eggs are elongated and it measures 0.05719 mm. in length and 0.02772 mm. in breadth (**fig.1**).

IV. DISCUSSIONS

After close observation under the microscope and identify with the help of Systems Helminthum trematode Vol-I & II Yamaguti (1971). The identified trematode parasite, *Allocreadium khami* n.sp. discussed with previous known species of *Allocreadium* are as given below.

The present worms closer with the species *A. mrigali* Gupta and Verma (1976), *A. saranai* Gupta and Verma (1976) and *A. baranai* Gupta and Verma (1976) which is having oral sucker is sub terminal, oesophagus absent, pharynx present, ventral sucker larger than oral sucker, cirrus pouch elongated, ovary is sub spherical, excretory bladder is tubular but it differ from the species *A. mrigali* Gupta and Verma (1976) having testes (rounded vs elongated), receptaculum seminis flask shaped, vitelline are (confluent or branched vs follicles); *A. saranai* Gupta and Verma (1976) which is having testes (rounded vs elongated, lobed) above mentioned species vesicula seminalis (oval and bipartite vs S-shaped); *A. baranai* Gupta and Verma (1976) having which is having testes (rounded vs oval), vesicula seminalis (oval and bipartite vs coiled) above species *A. saranai* Gupta and Verma (1976), *A. baranai* Gupta and Verma (1976) having receptaculum seminis pear shaped and vitelline are (confluent or branched vs follicular). Remaining species differs from the *Allocreadium khami* n.sp. are as discussed below,

The present worm differs from the species *A. isoporum* Looss (1900) from the intestine of *Tribolodon ezoe* in Hakkaido which is having prepharynx very short, pharynx (oval or elliptical vs barrel shaped), esophagus is long, seminal receptacle retort shaped, pars prostatica (tube like vs oval), ovary is (oval vs weakly tribulate).

The present trematode parasite differs from the species *A. lobatum* Wallin E. Ivan (1909) from the stomach of *Semotilus bullaris* in the presence of testes (rounded vs distinctly lobed), cirrus pouch (above the acetabulum vs centre of the acetabulum), vitellaria (confluent or branched vs large, spherical).

The present trematode worms differ from the species *A. handiai* Pande (1937) from intestine of *Ophiocephalus punctatus*, Lucknow, in having oral sucker (subterminal vs terminal), esophagus is short, pars prostatica (tube like, zigzag manner vs short), receptaculum seminis flask shaped, cirrus sac (elongated vs flask shaped), testes (rounded vs oval), vitellaria (confluent or branched vs follicular).

The present worm differs from the species *A. nemachilus* Kaw (1950) from the intestine of *Nemacheilus kashmirensis* in Kashmir. Which is having prepharynx globular, esophagus is long, seminal receptacle pear shaped, testes (rounded vs tandem), vitelline follicles (confluent or branched vs extend from the acetabulum upto posterior region of the body), excretory bladder (tubular vs spherical).

It differs from the species *A. thapari* Gupta (1950) from host, *Rita-rita* in India, in the presence of esophagus is small tubular, ventral sucker smaller than oral sucker, cirrus pouch (elongated or curved vs oval), and seminal receptaculum flask shaped.

The present worm differs from the species *A. kamlai* Gupta (1956) from host intestine of *Chela bacaila* (Ham.) in India, in the presence of prepharynx (absent vs present), seminal receptacle pear shaped, and vitelline gland (confluent or branched vs small follicles).

The present trematode worm differs from the species *A. mehrai* Gupta (1956) from host intestine of *Rhynchobella oculata* (Bloch.) in India, in the presence of esophagus short, seminal receptacle cylindrical.

The present parasite differs from the species *A. ophiocephali* Srivastava (1960) from host intestine of *Ophiocephalus punctatus* in India, in the presence of esophagus is short, seminal receptacle pear shaped, excretory bladder (tubular vs spherical) and vitelline follicles (confluent or branched vs at posterior body extend from posterior margin of the acetabulum).

The present worm differs from the species *A. dollfusi*, Rai (1962) from *Barbus tor* Hiran river, Katangi, in having Prepharynx long, esophagus is present, intestinal caeca ending blindly behind the posterior testes, testes (rounded vs oval), vitellaria (confluent or branched vs follicular).

The present trematode parasite differs from the species *A. singhi* Rai (1962) from *Barbus tor* in Sihora, which is having Prepharynx (absent vs very small), receptaculum seminis present, testes (rounded vs oval), and vitelline follicles are extending from anterior level of the ventral sucker to the posterior end of the body.

The present worms differ from the species *A. hirnai* Rai (1962) from *Barbus tor* near Hirani River, Katangi, in having oral sucker (subterminal vs terminal), esophagus is present, receptaculum seminis oval, testes (rounded vs oval), vitellaria (confluent or branched vs follicular).

The present parasite differs from the species *A. makundi* Gupta (1963) from *Barbus sarana* in India, in having oral sucker (subterminal vs terminal), Pharynx is (oval vs nearly spherical), esophagus

is present, seminal receptacle pear shaped, testes (rounded vs spherical, tandem), vitelline follicles extending from middle of ventral sucker to hind end of body.

The present worms differ from the species *A. heteropneustosis* Agarwal (1964) from *Heteropneustus fossili* in India, in having oral sucker (subterminal vs terminal), ventral sucker smaller than oral sucker, esophagus is short, testes (rounded vs oval), vitelline (confluent or branched vs follicular).

The present trematode worm differs from the species *A. ghanensis* Fischthal and Thomas (1972) from host *Synodontis* sp. (Monchocidae) in Ghana, in the presence of pharynx (oval vs pyriform), esophagus pouch present, posterior testes (circular vs longitudinally elongate), Laurer's canal opposite side of the ovary and Mehli's gland, vitelline follicles (confluent or branched vs small), excretory bladder (tubular vs wider).

The present parasite differs from the species *A. gwaliorensis* Bhadauria (1984) from *Mystus vittatus* in India, having oral sucker (subterminal vs terminal), vesicula seminalis (bipartite vs coiled), ovary rounded, vitelline follicles (confluent or branched vs commence asymmetrical).

The present trematode parasite differs from the species *A. tigarai* Bhadauria (1984) from *Channa punctatus* in India, which having ventral sucker is (larger vs smaller than oral sucker), esophagus is short, testes (rounded vs tandem), ovary (oval vs rounded), uterus short, vitelline follicles (confluent or branched vs commence asymmetrical).

It differs from the species *A. tosai* Takeshi Shimazu (1988) which is having, esophagus undulating, seminal vesicle (oval and bipartite vs tubular and sinus), pars prostatica (tube like vs claviform), Laurer's canal short, vitelline follicles (confluent or branched vs small), seminal receptacle retort shaped.

The present worm differs from the species *A. gotoi* Hasegawa et Ozaki (1926) comb.N. Takeshi Shimazu (1988) from *Misgurnus anguillicandatus* in Nagano which is having esophagus tube like, testes (circular vs oval and elliptical), seminal vesicle large tubular and pars prostatica (tube like vs claviform), testes (circular vs oval), seminal receptacle leaf shaped, Laurer's canal short, excretory bladder (tubular vs I shaped).

The present parasite differs from the species *A. lucyae* Ernest (1993) which is having esophagus long, testes (rounded vs contiguous, subequal in size), receptaculum seminis pear shaped, vitellaria commencing at acetabulum and extending uninterrupted to posterior end of the body.

The present worm differs from the species *A. patagonicum* Takeshi et al. (2000) from *Percichthys colhuapiensis*, which is having eyes spot pigment solid, esophagus S- shaped, pars prostatica (tube like vs elliptical), ovary (oval vs nearly triangular), excretory bladder (tubular vs I shaped).

The present trematode worm differs from the species *A. shianoense* Takeshi Shimazu (2003) from intestine of *Phoxinus lagowski steindacheri sauvage* (cyprinidae) in Japan in the presence of esophagus long, testes (circular vs elliptical), cirrus sac claviform, Laurer's canal short, seminal receptacle ovate, vitelline follicles (confluent or branched vs large distributed from pharynx level of posterior end), excretory bladder (tubular vs I shaped).

The present worm differs from the species *A. aburahaya* Takeshi Shimazu (2003) from intestine of *Phoxinus lagowski steindacheri sauvage* (cyprinidae) in Japan in the presence of eyes spot pigment dispersed, esophagus undulating, testes (circular vs irregularly, indented), vesicula seminalis (oval and bipartite vs S-shaped), pars prostatica (tube like vs globular), seminal receptacle ovate, Laurer's canal short, excretory bladder tubular vs I-shaped.

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