

A NEW SPECIES OF GENUS *ALLOCREADIUM* FROM JAYAKWADI DAM (M.S.)

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ABSTRACT : Living organisms are very important part of life on this earth which includes all plants and animals from micro-organisms upto huge plants and animals. Many animals like birds, reptiles, mammals and fishes are useful for food, skin, bones, teeth etc. But under certain circumstances, all living organisms are susceptible to diseases and fishes are no exception. A majority of fishes carry heavy infestation of helminth parasites which cause deterioration in their food value and may result in heavy mortality. Besides, infected fishes act as a very potent source of helminth infection of man and they are transmitted to man only through eating of fish.

Key words : *Allocreadium*, *Gobius guiris*.

INTRODUCTION

Looss (1894) erected the genus *Allocreadium* for the type species *Allocreadium isoporum* from the fish *Cyprinus carpio* from Germany. Looss, 1894 and Odhner (1901) described *Allocreadium isoporum* from *Cyprinus carpio*, *Carassius carassius*, *Phoxinus laevis*, from Slusarski. Poche (1925) was the first to place *Sphaerostomatinae* under the family *Allocreadiidae* which he divided into five subfamilies viz. *Allocreadiinae* Looss, 1899, *Lepocreadinae* Odhner, 1905, *Stephanophialinae* Nicoll, 1909, *Sphaerostomatinae* Poche, 1925 and *Coitocaenciae* Poche, 1925. According to Thaper *et al.* (1934) the subfamilies *Lepocreadinae* and *Stephanophialinae* resemble, the subfamily *Allocreadiinae* in all essential features. A number of *Allocreadium* species have been described from fishes which are mentioned in discussion.

MATERIAL AND METHODS

The trematodes were studied in live condition using neutral red and methylene blue. For morphological studies, specimens were fixed in 4% formalin or 70% alcohol. They were stained in Delafield's haematoxylin and Acetocarmine. After staining the specimens were dehydrated in ascending grades of alcohol. In order to remove traces of moisture they were passed through 50% absolute alcohol+50% Acetone and then they were passed through 50% Acetone+50% Benzene and then Benzene. Finally they were passed through 50% Benzene+50% Xylol. They were cleared in Clove oil and finally mounted in D.P.X. mountant. For the study of cuticular structures, Glycerine-alcohol of various percentages was found to be suitable. The drawings were made with the help of a Camera Lucida. All measurements are in millimeters unless otherwise mentioned.

Description : During the survey of trematodes in the year 2004-05, a few parasites from the genus *Allocreadium* were found to harbour the intestine of freshwater fish *Gobius giuris*. The body of the fluke is elongated, smooth with anterior rounded end and posteriorly narrow end. It measures from 2.31 x 0.62 (2.011-2.61 x 0.54-0.71) mm in breadth. The oral sucker is sub-terminal and rounded in shape, measuring 0.30 x 0.29 (0.28-0.32 x 0.26-0.32) mm in breadth. The ventral sucker is spherical, smaller than oral sucker, pre-equatorial, measuring 0.20 mm in diameter lying at 0.70 mm from anterior end of the body. The pre-pharynx is absent, Pharynx is oval, muscular measuring 0.109 x 0.107 (0.9-0.12 x 0.10-0.11) mm in breadth. The oesophagus is short, tubular measuring 0.03-0.10 mm long. The intestinal caeca is simple extending upto posterior end of the body. The genital pore is median, intercaecal occurring between acetabulum and intestinal bifurcation and lying at 0.52 mm from anterior end. The excretory pore lies at the posterior end of the body. The excretory bladder is tubular extending upto hind end of posterior testis. The testes are entire, oval or spherical, tandem, intercaecal, in equatorial region of the body. The testes are postovarian and anterior testis is smaller than posterior testis. The anterior testis measure 0.245 x 0.193 (0.20-0.29 x 0.16-0.227) mm in size lying at 1.21 mm from anterior end of the body. The posterior testis measures 0.371 x 0.224 (0.288-0.454 x 0.20-0.24) mm in size and lies at a distance of 1.30 mm from anterior end of the body. The cirrus pouch which is flask-shaped partly overlapped by acetabulum is present. The pars prostatica lies anterior to vesicula seminalis. The pars prostatica opens into a muscular cirrus through an ejaculatory duct. The pars prostatica is surrounded by a large number of prostate gland cells. The ovary is entire, oval, pretesticular, pre-equatorial lying between acetabulum and anterior testis. It measures 0.196 x 0.159 (0.176-0.217 x 0.14-0.17) mm in size and lies at a distance of 0.91 mm from anterior end of the body. From dorsal part of the ovary arises oviduct which opens at ootype. The receptaculum seminis is elongated lying on posterior side of ovary, coinciding with posterior margin of ovary. The vitellaria are follicular, extending from hind of posterior of ventral sucker upto posterior end of the body

lying mainly on lateral fields and behind the posterior testes, intruding in the intercaecal space. The uterine coils lies in between genital pore and anterior testis. The eggs are oval, operculated, few in numbers, measuring 0.016 x 0.048 (0.09-0.075 x 0.042-0.058) mm in size.

RESULTS AND DISCUSSION

The present form differs from the following species : From *Allocreadium isoporum* (Looss, 1894) Odhner (1901), after Looss (1894) in the absence of genital pore which is post bifurcal, vitellaria only in hind body, a long oesophagus, in the position of ventral sucker which is immediately postbifurca, 1 ovary immediately posterior to ventral sucker. From *A. lobatum* Wallin (1901) in the absence of a smaller oesophagus, in the caecal bifurcation which is immediately anterior to ventral sucker, cirrus pouch overlapping acetabulum and intestinal bifurcation, testes lobular and immediately postovarian. From *A. transversale* (Rud, 1802) Odhner (1901). *A. pallens* (Rud, 1819), *A. hasu* Ozaki (1926), *A. jaoponicum* Ozaki (1926), *A. neotenicum* Peters (1957), *A. spindale* Saksena (1958) and *A. gyanpuri* Gupta (1959) in having oral sucker larger than ventral sucker and from *A. hasu* in not having irregular lobed testes. The present form differs from *A. amandalei* Southwell (1913), *A. mahaseri* Pande (1936), *A. nemachilus* Kaw (1950); *A. mehrai* Gupta (1956), *A. kamalai* Gupta (1956), *A. spindale* Saxena (1958) and *A. makundi* Gupta (1962) in not having oral sucker equal to or smaller than ventral sucker. From *A. handiai* Pande (1937) in the position of cirrus sac which ends anteriorly to ventral sucker, vitelline follicles only in lateral fields and small, uterus is not seen, only two eggs present and testes situated just behind the equatorial region with some distance between them. From *A. markewitschi* Koval (1949) in the absence of length of caecal bifurcation, ovary in close association with acetabulum, cirrus sac completely preacetabular, acetabulum overlapping both caeca, genital pore extracaecal at oesophageal level. From *A. schizothoraxi* Pande (1950), in the difference of size of organs and body, ventral sucker larger than oral sucker and subequal testes. From *A. nemachilus* Kaw (1950) in the absence of position of acetabulum which is extracaecal and overlaps oesophagus and caeca, testes overlap one another, ovary immediately post-bifurcal. From *A. thapari* Gupta (1950) in the absence of position of acetabulum which overlaps one caecum, big vitelline follicles and preacetabular extent of excretory bladder and upto middle of posterior testis. From *A. kamalai* Gupta (1956) in the absence of position of testes in post-equatorial region, ovary and acetabulum in parallel position, an extracaecal acetabulum, genital pore ahead of caeca. From *A. mehrai* Gupta (1956) in the absence of position of genital pore which is immediately preacetabular, an overlapping acetabulum on caeca, very few eggs, in the smaller size of oral sucker than ventral sucker

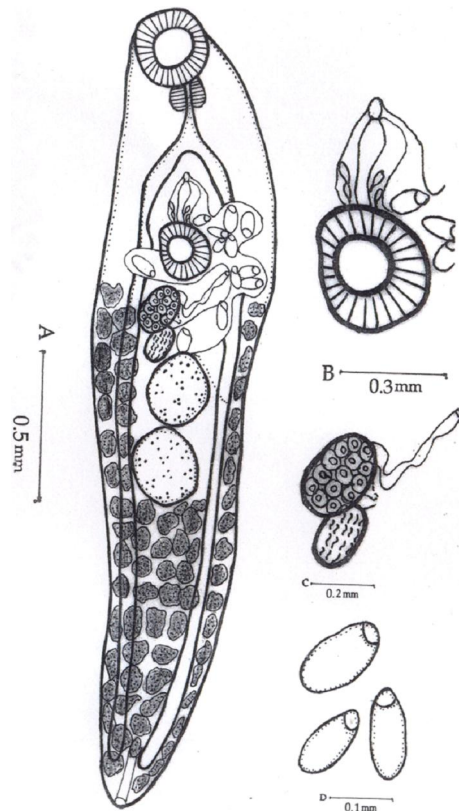


Fig. 1 *Allocreadium gobiosis*, Fig. 2 Eggs, Fig. 3 Ovarian complex, Fig. 4 Ventral sucker.

and extent of excretory bulb up to anterior testis. From *A. ophiocephali* Srivastava (1960) in the absence of position of acetabulum and ovary which are oblique, far apart testes, commencement of vitelline follicles from anterior of testicular region, an oval pharynx and shape of the fluke. From *A. singhi* Rai (1962) in the absence of a small prepharynx and position of cirrus sac in pre-acetabular region, intestinal caeca not reaching up to posterior end, excretory vesicle ending far away of posterior testis, genital pore overlapping caeca. From *A. mazoensis* Mary (1962) in the absence of small vitelline follicles distributed densely, intestinal bifurcation on acetabular region, ovary immediately post acetabular, external seminal vesicle extremely variable in size, genital pore at oesophageal region. From *A. dollfusi* Rai (1962) in the absence of a prepharynx, in the position of a lateral cirrus sac to acetabulum, ovary immediately posterior to cirrus sac, small vitelline follicles sparsely distributed, course of uterus, receptaculum seminalis is in between ovary and anterior testis, excretory vesicle extending to the middle of posterior testis and genital pore on caecal bifurcation. From *A. hirnai* Rai (1962) in the absence of position of testes in the hind region of the body, cirrus sac away from acetabulum, a curved oesophagus, oral sucker smaller than ventral sucker, a terminal oral sucker, uterus extending upto anterior testis. From *A. makundi* Gupta (1963) in the absence of terminal oral sucker, equal ratio of suckers, testes near posterior region of the body, ovary post-acetabular. From *A. heteropneustusius* Agarwal (1964) in the absence of position of receptaculum seminalis which is in between ventral sucker and ovary, big size of vitelline follicles and body form. From *A. heteropneustusius* Agarwal (1964) in the absence of the extension of vitellaria from hind end of ventral sucker upto a little in front of hind end of the body. From *A. ghanensis* Fischthal *et al.* (1972) in the absence of eye spot pigment granules scattered on each side of pharynx, a prepharynx, an oesophageal pouch, seminal receptacle bigger than ovary, excretory bladder becoming wider anteriorly and extending anteriorly to level between anterior testis and ovary, a pyriform pharynx overlapping oral sucker dorsally, oral sucker smaller than ventral sucker, testes and ovary immediately one above the other and a preacetabular cirrus sac. From *A. sudanensis* Saoud (1974) in the absence of a short oesophagus, an overlapped testes, ovary immediately preacetabular, cirrus sac overlapping caecal bifurcation, broad caeca, compact vitelline follicles commencing from the posterior border of ovary upto a little ahead of posterior end of body, ventral sucker larger than oral sucker and body form. From *A. mirgalai* Gupta *et al.* (1976) in the absence of elongated testes, cirrus sac overlapping on caecum, oral sucker smaller than ventral sucker, commencement of vitelline follicles from oesophageal region. From *A. saranai* Gupta *et al.* (1976) in the absence of antero-lateral cirrus sac, ovary overlapping acetabulum from antero-left, pear shaped receptaculum seminalis, ventral sucker larger than oral sucker, ovary overlapping left caecum while acetabulum overlapping right caecum. From *A. baranai* Gupta *et al.* (1976) in the absence of oral sucker smaller than ventral sucker, an extracaecal acetabulum, oblique testes, genital atrium median in proximity of pharynx, pear shaped receptaculum seminalis. From *A. handiai* Madhavi (1980) in the absence of genital pore being immediately prebifurcal, ovary postero-lateral to acetabulum, testes one behind the other. From *A. carparum* Odening (1959), Moravec (1984) in the absence of testes in hind body which are apart from each other, ovary coinciding with the acetabulum, caeca bifurcates at acetabular region, genital pore is on oesophagus, cuticles on anterior end of body and both suckers bearing minute papillae. From *A. schizothoraxis* Pande, 1938, Bhadauria *et al.* (1984) in the absence of a cirrus sac on left caecum, testes below equatorial line, commencement of vitelline follicles from the acetabular level. From *A. tigarai* Bhadauria *et al.* (1984) in the absence of a prebifurcal and preacetabular cirrus sac, ovary near right margin of body in the middle. From *A. papilligerum* Moravec (1984) in the absence of commencement of vitelline follicles from the region of acetabulum, genital pore on oesophageal region, acetabulum larger than oral sucker, cuticles on anterior end of body and both suckers bearing minute papillae. From *A. mahaseri* Pande (1938), Bhadauria & Dandutia (1984), in the absence of a small oral sucker, larger ventral sucker, a postbifurcal genital pore, acetabulum on left caecum, cirrus sac partly, intercaecal and partly extracaecal. From *A. schizothoraxis* Pande (1938), Bhadauria *et al.* (1984) in the absence of a cirrus sac on left caecum, testes below equatorial line, commencement of vitelline follicles from the acetabular level, ovary in between acetabulum and anterior testes. From *A. gwaliorensis* Bhadauria *et al.* (1986) in the absence of acetabulum overlapping on left caecum, ovary and receptaculum seminalis overlapping each other, vitelline follicles are sparsely distributed and a curved cirrus pouch. From *A. ovatum* Banerjee *et al.* (1992) in the absence of an oval body, testes situated near posterior end overlapping one another, ovary on left posterior of acetabulum. From *A. bengalensis* Banerjee *et al.* (1992) in the absence of position of testes in the middle of hind body, ovary overlapping on one caecum, a completely intercaecal uterus and more uterine coiling. From *A. glossogobium* Banerjee *et al.* (1992) in the absence of a long oesophagus, genital pore overlapping on left caecum, ventral sucker larger than oral sucker, receptaculum seminalis at same level of ovary.

From *A. mymensinghi* Banerjee *et al.* (1992) in the absence of ovary overlapping anterior testis, testis oval and triangular, vitelline follicles small in lateral fields, uterus and eggs are not seen. From *A. minutum* Banerjee *et al.* (1992) in the absence of ovary immediately post-acetabular, irregular shape of testes and cirrus sac, uterus, eggs are not seen. From *A. (neallocreadium) lucyae* sp.n. (Ernest *et al.*, 1992) in absence of commencement of vitelline follicles from the shoulder region, acetabulum overlapping intestinal bifurcation, testes accommodating all caecal region completely, genital pore being preacetabular. From *A. brevivitellatum* (Shimazu, 1992), Ernest *et al.* (1992) in the absence of a very long oesophagus, extracaecal acetabulum, irregular shaped testes and an extracaecal cirrus pouch. From *A. gotoi* (Shimazu, 1988a), Ernest *et al.* (1992) in the absence of commencement of vitelline follicles from preacetabular region, curved oesophagus and gaps between testes. From *A. isoporum* (Shimazu, 1988a), Ernest *et al.*, 1992 in the absence of long and

curved oesophagus, acetabulum overlapping on caecal bifurcation, extracaecal genital pore and irregular shaped ovary. From *A. tosai* (Shimazu, 1988a), Ernest *et al.* (1992) in the absence of a extracaecal genital pore, commencement of vitelline follicles from oesophageal region and acetabulum partly intercaecal and partly extracaecal. From *A. patagonicum* Takeshi *et al.* (2000) in the absence of position of genital pore which is extracaecal, testes in post-equatorial region, an elliptical pharynx, commencement of vitelline follicles from pharyngeal region, a clavate cirrus pouch, nearly triangular ovary, excretory vesicle reaching ovary, excretory pore surrounded by gland cells and an 'S' shaped oesophagus. From *A. shinanoense* Shimazu (2003) in the absence of a longer eversible ejaculatory duct and a shorter excretory vesicle. From *A. aburahaya* Shimazu (2003), in the absence of irregularly indented testes and ovate cirrus pouch. From *A. pichi* Veronica *et al.* (2004) in diagonal position of testes and different ratio of suckers. From *A. malabarensis* Brinesh *et al.* (2007) in the absence of a curved cirrus, saccular, seminal receptacle, laurer's canal reaching upto level of anterior testis. From *A. daanjiangensis* n.sp. Dian *et al.* (2008) in the absence of cirrus sac lying obliquely overlapping right or left caeca, ovary overlapping testis borders and a groove on inner wall of acetabulum. From *A. clariasi* Pal and Mishra (2009) in the absence of aspinose body and sub-spherical pharynx. The above characters are sufficient to establish a new genus as *A. elongatus* as the body is huge in size.

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