



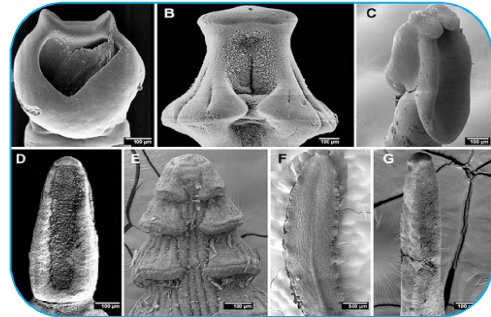
SCANNING ELECTRON MICROSCOPIC STUDY OF CIRCUMONCOBOTHRIUM SP. INFECTING MASTACEMBELUS ARMATUS

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ABSTRACT:

The present study was undertaken to determine the ultrastructure of helminth parasite *Circumoncobothrium* species from freshwater fish *Mastacembelus armatus*. The present study deals with the survey of freshwater fishes from Latur District (M. S.) India. This study summarizes the data of freshwater fishes associated with helminth parasites from February 2011 to January 2012. Fish samples were collected from different localities of Latur District. All fishes were examined for the presence of internal helminth parasites in the digestive tract. Total 186 number of fish were examined. Scanning electron microscope observations revealed some differences between the present species and other related helminthes detected before.



KEY WORDS: *Mastacembelus armatus*, Senga species, SEM.

INTRODUCTION:

Fish population of India suffers from natural infections by helminth parasites, some of them are proven pathogenic causing severe economic losses by rendering the flesh of food fish unpalatable. Information on the population dynamics, histopathological and histochemical study of helminth parasites is important, since it is an essential pre-requisite for formulating effective control measures against endoparasitic infections. Fishery industry is waiting for proper eradication of infectious agents of fishes. Parasites are extremely abundant and diverse in nature, representing a substantial portion of global biodiversity. Helminthes are an important group of animal parasites occurring in the adult stage usually in vertebrate host, practically invading every organ system of the host and larval stage in the invertebrate hosts. These worms are widespread in almost all animals in every part of the world, though the intensity of infection may differ from time to time or place to place and they produce a wide variety of direct effects, thus they play a vital role in welfare of man and animals with which is associated to smaller or greater extent. Srivastava, (1975) stated that most species of helminths in adult stage live in the alimentary canal these, parasites have detrimental effects upon fish in more ways than one. Hoffman and Bauer (1971) stated that the life cycle of most helminth parasite are so complex involving more than one intermediate host including fish that their study enable one to better understand the dynamics of aquatic system as a whole.

MATERIALS AND METHODS

Collection of host fish species:

The freshwater fishes were collected from different localities of Latur district during the period of July 2010 to June 2014. The hosts were caught randomly for every month, usually during daytime and some at night and noted down their taxonomic data properly. Some of them were also obtained from local animal suppliers. From them, relevant information was also obtained with respect to the host's locality, date of collection, etc. and then brought to the laboratory. During observation of population dynamics of *Senga* sp. a total 186 fishes of *Mastacembelus armatus*, out of which 94 females and 92 males were examined. Among them 21 females and 13 males found infected, resulting in 37.50 % prevalence of infection in males and prevalence of infection in females for year 2012-13.

Examination of fish for collection of parasites:

Examination of intestinal parasites was carried out by using the method described by Hassan *et al.*, (2010). After the separating and counting the population of different helminth parasites from different freshwater fishes the parasites were preserved in separate bottles. Some of these were used for the taxonomic study.

Preparation of cestode specimens for Electron Microscopy (SEM)

Specimen for scanning electron microscopy (SEM) were fixed in cold 4% glutaraldehyde in buffer (pH 7.2) and kept in it for 24 hours, then dehydrated through a graded series of alcohol, infiltrated with amyl acetate, after critical drying mounted on stubs, coated with gold and photographs were taken with the help of SEM. Joel Japan JSM 6380A at an accelerating voltage of 20KV at Icon analytical laboratory, Warli, Mumbai (M.S) India. The SEM measurements were in micrometer. The identification is made with the help of "Systema Helminthum" by Yamaguti (1958, 1961).

OBSERVATIONS AND RESULTS

During observation of population dynamics of *Senga* sp. a total 186 fishes of *Mastacembelus armatus*, out of which 94 females and 92 males were examined. Among them 37 found infected.

Circumoncobothrium sp.

Systematic position

Kingdom	Animalia
Phylum	Platyhelminthes
Class	Cestoda
Order	Psuedophyllidea
Family	Ptychobothridae
Genus	<i>Circumoncobothrium</i>

Host: *Mastacembelus armatus*

Prevalence: highest monthly prevalence (57.14) in male and (42.86 and 37.5) in female

Location: intestine

Locality: Latur, AUSA, Udgir (MS).

Total No. of fish examined: 186

Total No. of fish infected: 37

No. of specimens collected: 75

(Figure 1.)

The genus *Circumoncobothrium* sp. was erected by Shinde (1977) from the intestine of freshwater fish *O. leucopunctatus* as a type species *C. ophioccephali*. Jadhav and Shinde (1976) added three new species of this genus which are *C. aurangabadensis* and *C. raoii* from *Mastacembelus armatus* and *C. gachuai* from *O. gachua*. Chincholikar and Shinde (1977) described a new species of this genus *C. shindei* from freshwater fish *Mastacembelus armatus*. Jadhav (1990) described Yamaguti, from

Mastacembelus armatus. Patil *et al.*, (1998) added a new species *C. vadgaonensis* from *Mastacembelus armatus*. Pawar (2002) added *C. armatusae* from *Mastacembelus armatus*. Shelke (2007) added *C. mehdii* from *Mastacembelus armatus*. Pardeshi and Hiware (2011) added *C. jadhavae* from *Mastacembelus armatus*. Lastly Kadam and Dhole (2011) added *C. clariase* from *Clarias batrachus*. The present worm comes closer to all the known species of the genus *Circumoncobothriu*

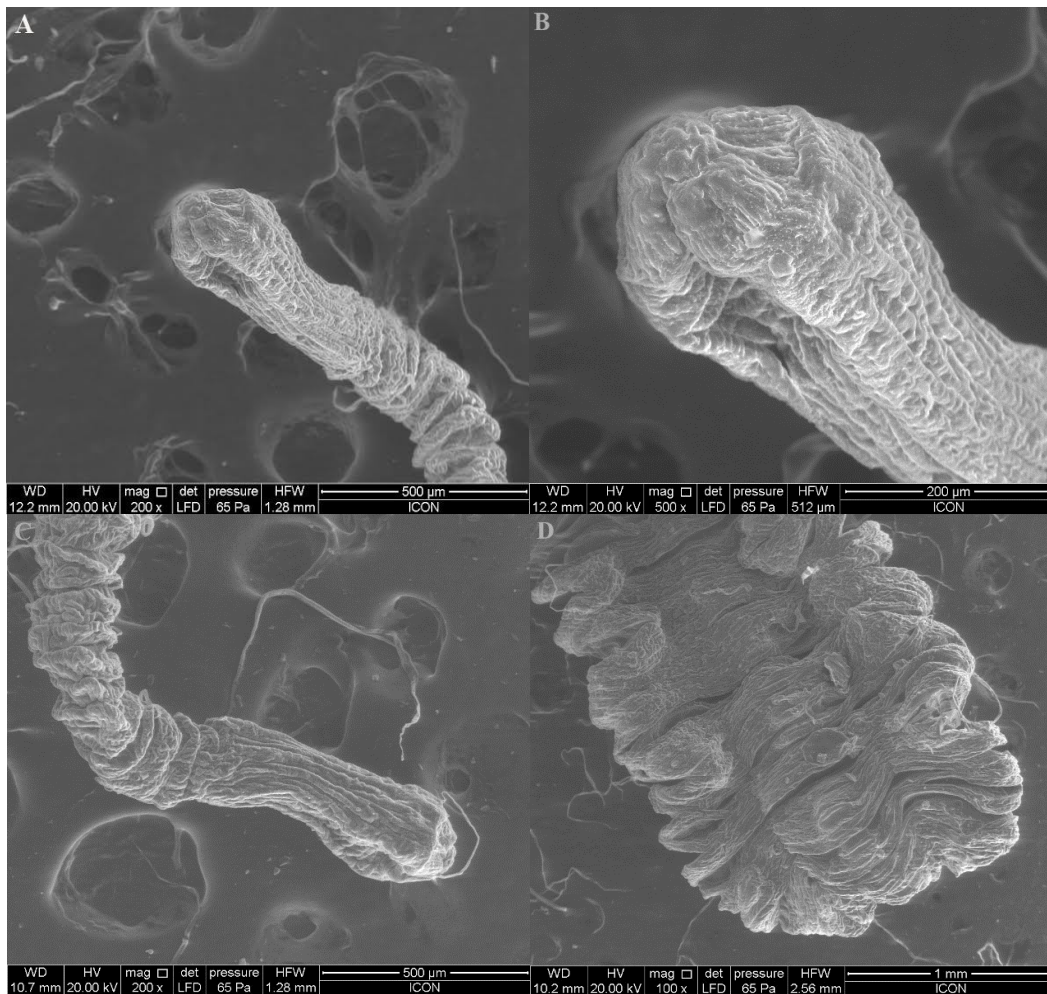


Figure 1: SEM photomicrograph of *Circumoncobothrium sp*

- A. Scolex and neck
- B. Scolex and rostellum
- C. Entire parasite
- D. Gravid proglottid

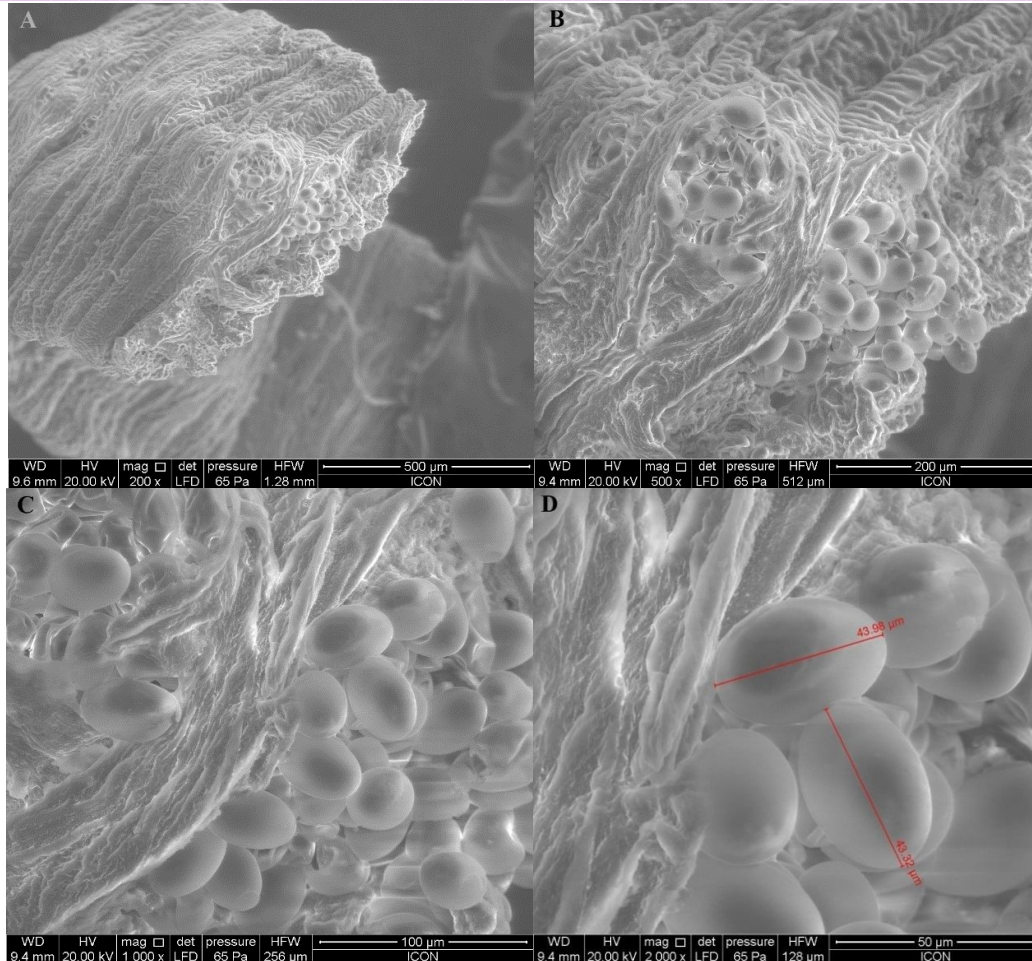


Figure 2: SEM Photomicrograph of *Circumoncobothrium* sp.

- A. Gravid segment
- B. Mature segments showing testes and ovaries
- C. Showing gravid segments filled with the eggs
- D. Eggs with embryo (43.32 to 43.98 m)

DISCUSSION

The present studies on parasite fauna of fishes of Latur district would increase its relevance to understand key roles in ecosystems, regulating the abundance or density of helminth parasite populations and structuring host communities. Thus, the present study would be a useful tool to understanding of the biodiversity of fish parasites and consequently, fisheries management and conservation of aquatic resources. The scolex was found to be long, bluntly rounded tip, broader in the middle, narrow posteriorly and measured 1.208-1.235 in length and 0.302-0.625 in breadth. The rostellum is medium, transversely elongated, oval and measures 0.038-0.061 in length and 0.112-0.120 in breadth. The rostellar hooks are 48 in number, variable in size, straight, rod like and measures 0.026-0.078 in length and 0.003-0.010 in breadth. The bothria are two, extends from anterior to posterior extremity of the scolex, slightly overlapping on each other and measures 0.844-0.898 in length and 0.062-0.070 in breadth. The neck is short and measures 0.031-0.051 in length and 0.276-0.282 in breadth. The mature segments are medium, broader than long and measures 2.010-2.221 in length and

0.322-0.419 in breadth. The testes are 199-208, medium, round, in two groups on lateral sides of ovary, unequally distributed and measures 0.105-0.111 in diameter. The cirrus pouch is medium, oval, obliquely placed in the middle of the segment and measures 0.160-0.179 in length and 0.018-0.085 in breadth. Eggs with embryo are 43.32 to 43.98 μ m.

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