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SCANNING ELECTRON MICROSCOPIC AND PATHOLOGICAL STUDY OF GANGESIA SP. INFECTING WALLAGO ATTU

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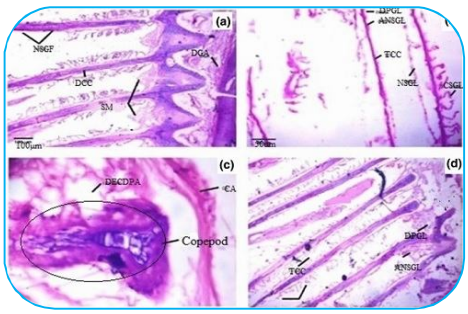
ABSTRACT:

The present study was undertaken to determine the ultrastructure of helminth parasite Gangesia species from freshwater fish Wallago attu. 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. In present investigation Gangesia species collected from wallago attu were taken for scanning electron microscopic studies.



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.

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

Gangesia sp.

Systematic position	
Kingdom	Animalia
Phylum	Platyhelminthes
Class	Cestoda
Order	Proteocephalidea
Family	Proteocephalidae
Genus	*Gangesia*

Host: *Wallago attu*
Prevalence: highest monthly prevalence (50.0) in male and (42.86) in female
Location: intestine
Locality: Latur, Ausa, Udgir (MS).
Total No. of fish examined: 182
Total No. of fish infected: 42
No. of specimens collected: 63
(Figure 1)

The genus *Gangesia* was erected by Woodland in 1924 with its type species *G. macrons* collected from the *M. seenghala* from India. Verma (1928) described *G.pseudotropii* from Pseudotropius garua. Southwell, (1930) added *G.bengalensis* from *Ophiocephalus striatus*. Jadhav *et al;* (1997) added *G. dharurensis* from *Wallago attu.* Hiware (1999) added *G.seenghali* from *Mystus seenghala.* Then Reddy *et al.,* 2011 added *Gangesia bendsurensis* from the freshwater catfish *Wallago attu.* Recently Bhavare *et al*., 2012 added a new species *G. jayakwadensis* from *Clarias batrachus.*

The present communication deals with the description of a new species under the same genus. The genus *Gangesia* is the representative of the family Proteocephalidae from fresh water fishes. Scolex consists of four big suckers, round to oval in shape, slightly protruded, muscular hence present species falls under genus *Gangesia* collected from freshwater fish *Wallago attu.*

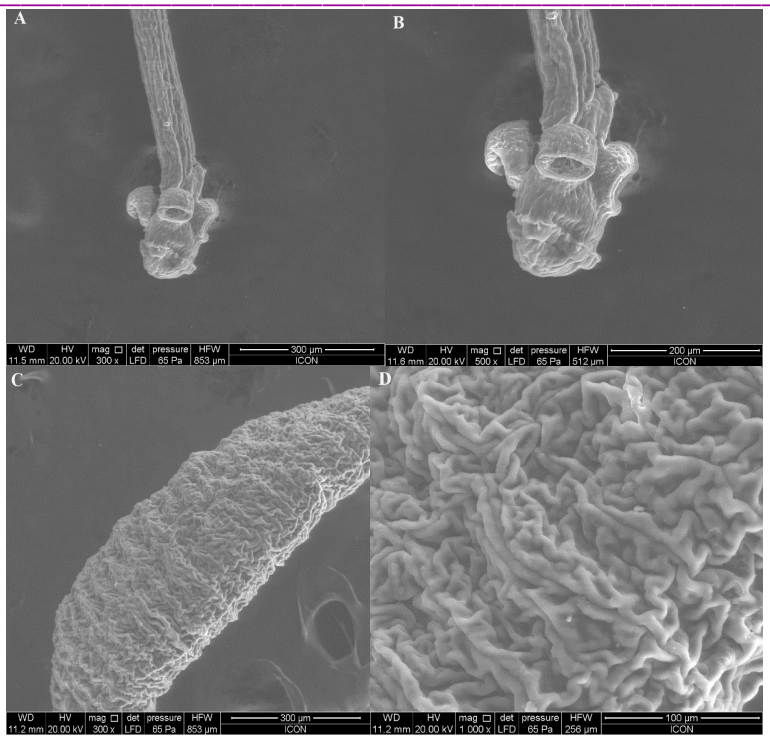


Figure 1: SEM Photomicrograph of *Gangesia Sp.*

A. Scolex and neck
B. Scolex and rostellum
C. Mature gravid proglottid
D. Magnified gravid proglottid

Host Tissue Damage Assessment:

SEM can reveal the extent of damage to the intestinal lining of Wallago attu, including the disruption of villi, the formation of lesions, and the infiltration of inflammatory cells into the intestinal wall.

Parasite-Host Interaction:

SEM can help visualize the interaction between the parasite and the host tissue, showing how Gangesia sp. penetrates the intestinal layers and utilizes host resources.

Specific observations that can be made using SEM:

Scolex morphology:

SEM can reveal the presence and arrangement of hooks and suckers on the scolex, which are important for attachment to the host's intestine.

Villi disruption:

SEM can show how the parasite's presence leads to the breakdown and flattening of the intestinal villi, which are crucial for nutrient absorption.

Ulcerative lesions:

SEM can reveal the formation of ulcerated areas on the intestinal surface due to the parasite's activity.

Inflammatory response:

SEM can show the infiltration of inflammatory cells (like lymphocytes and plasma cells) into the intestinal tissue surrounding the parasite, indicating the host's immune response

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. The cestode parasite Gangesia sp. from the host Wallago attu, penetrates deep into the intestinal layers and reaches up to the muscularis layer. Laxma Reddy and Benarjee (2014) observed that the stomach is highly affected due to helminth infestation which was evidenced by total destruction of villi from the mucous membrane which resulted in disruption of the structural organization of the organ which might have profound influence on the nutrition and digestion process of the fish. Gangesia sp. causes damage to the intestinal villi, ulcerative lesions, atrophied cellular organization, infiltration of cellular organization into fibers and moderate diffuse necrosis of surface epithelium.

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