



A REPORT ON METACERCARIAE FOUND IN TWO FRESH WATER FISHES IN IMPHAL WEST DISTRICT OF MANIPUR

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ABSTRACT

An investigation was conducted in 20 different localities of Imphal west district on helminth parasites of fresh water fishes in Manipur, the authors came across some specimens of *Heteropneustes fossilis* and *Colisa fasciatus* infected with numerous metacercariae. The metacercariae found in *Heteropneustes fossilis* measures 4.88 – 9.82 mm whereas the metacercariae found in *Colisa fasciatus* measures 4.60 – 9.72 mm. The difference in the structural organization during different stages is studied and described.

KEYWORDS : Metacercariae, *Heteropneustes fossilis* , *Colisa fasciatus* and Manipur .

INTRODUCTION

Metacercaria is one of the most interesting stages in the life cycle of a digenean. It is an infective stage and is morphologically similar in most of its stages for a particular species except for the structural development in the reproductive organs. The present study is a preliminary observation on the morphological characters of the metacercariae found in the fresh water fishes.

MATERIALS & METHODS

Metacercariae were collected from the eye skin and visceral organs of the host's fishes and washed in 0.7% normal saline solution. They were fixed in 70% alcohol and preserved in between the folds of two glass slides in 70% alcohol containing few drops of Glycerine. Aceto-alum carmine was used for staining and permanent slides were prepared. Measurements were taken, diagrams were drawn with the help of camera lucida and photographs were taken using Olympus camera. The identification is based on the Keys provided by Sudarikov, 1971³.

RESULTS & DISCUSSION

Numerous cysts as well as metacercariae recovered from *Heteropneustes fossilis* were larger in size and the cysts were with thick wall which were difficult to break with needle, whereas the metacercariae and cysts recovered from *Colisa fasciatus* were comparatively smaller in size. The cysts wall of the metacercariae found in *Colisa fasciatus* were thin and easily breakable. Organs like ventral sucker, intestinal caeca and testes were well marked. The metacercariae found in the two different hosts were almost similar in their morphological features except for the variations found in their body size and the development patterns of their suckers and pharynx. The trematode *Astiotrema reniferum* and *Astiotrema*

heterospinosa recovered from the intestine of the host fishes indicates that the metacercariae found in them is perhaps the larval stages of these two particular trematodes. The study conducted during May, 2013 to April, 2014 revealed the occurrence of this kind of metacercariae and trematodes in abundance. The three stages of metacercariae which are frequently encountered are named as Stage – 1, Stage – 2 and Stage – 3 and have been studied from morpho-taxonomic point. Their measurements, camera lucida drawings and photomicrographs are taken into account for the study. The stage-1 is the longest measuring about 4.88 – 9.82 mm. Oral sucker is not seen, Ventral sucker is situated at 1.25 mm from the anterior end and it measures 0.65 – 0.85 x 0.78 – 0.89 mm. Reproductive organs are not properly developed even though the body size is very large. The stage-2 measures 3.36 – 6.32 mm in length and 1.22 – 2.36 mm in width. Oral sucker is slightly developed and measures about 0.21 – 0.26 x 0.22 – 0.28 mm. Ventral sucker is well marked and situated at 1.26 mm from anterior end, measuring 1.03 – 1.08 x 1.01 – 1.07 mm. But the development of the ventral sucker is incomplete. Reproductive organs like testes and ovary have also developed incompletely. Anterior testis measures 0.23 – 0.35 x 0.22 – 0.38 mm and posterior testis measures 0.21 – 0.28 x 0.41 – 0.41mm. The organs have not possessed their actual shape and size. They seem to be in rudimentary stage or under developed stage but the body size has become smaller in comparison to stage-1 species. The stage 3 species measures 3.22 – 4.90 x 1.15 – 1.18 mm. Oral sucker measures 0.21 – 0.23 x 0.03 – 0.06 mm. Development of Pharynx is incomplete and ventral sucker is situated at 0.91 mm from anterior end of the body. Anterior testis measures 0.4 – 0.6 x 0.1 – 0.3 mm. Posterior testis measures 0.3 – 0.7 x 0.1 – 0.3 mm.



FIGURE 1:- Photomicrograph of Metacercariae – Stage -1, Stage -2 and Stage -3

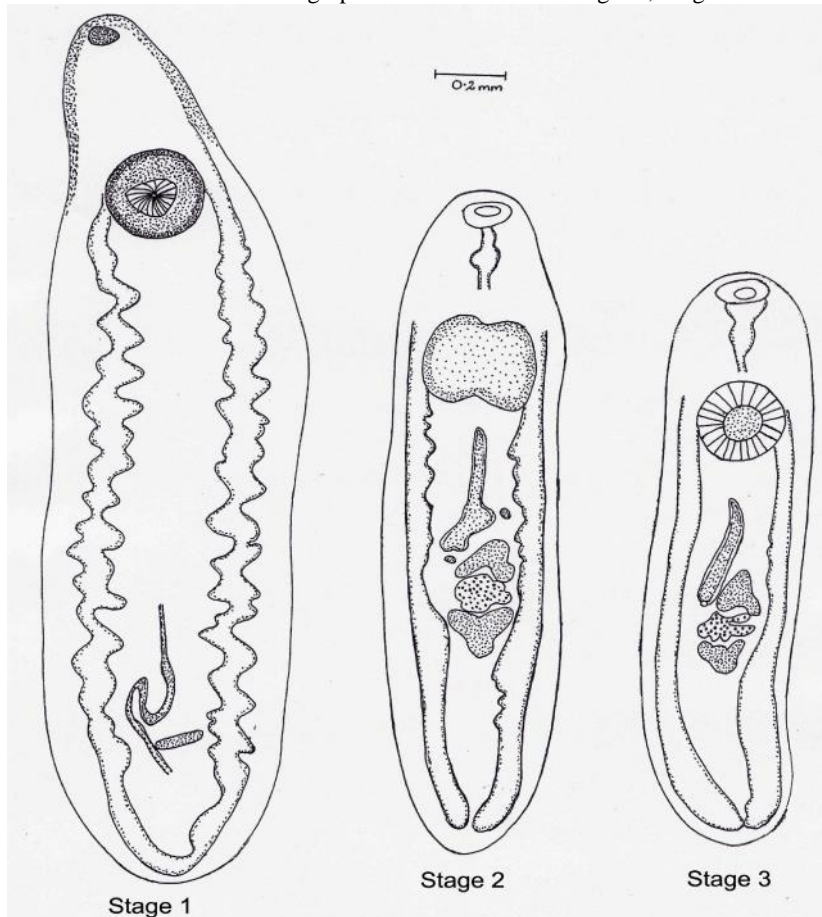


FIGURE 2: Camera lucida drawing of Metacercariae – Stage -1, Stage -2 and Stage -3

The character of this metacercariae comes closer to *Clinostomoides* Dollfus, 1950² but differs in possession of pharynx and the shape of ovary. The decrease in the body size and development of organs which is well marked in the stage-3 species reveals the attainment of adult stage or miniature adult. Though not certain the information provided in literatures helped the authors in ascertaining

the change in the structural organisation of the metacercarial stages. Limited information is available on the effect of metacercaria on hosts and practically no comprehensive work has been done on the physiology of metacercariae. Many workers like Southwell (1913) reported for the first time in India about a metacercaria "*Diplostomum*" from *Nandus marmoratus* at Kolkata. In the

80s and 90s many workers like Agarwal, N, 1982¹; Tiwari, 1982; Singh and Sharma, 1994; Thakur and Prasad, 1997 have worked from regions of India but a thorough and systematic morphometric study is still lacking. According to Pandey and Baugh, 1970; Siddiqui and Nizami, 1982⁴; Madhawi and Ruckmani, 1991- the prevalence and intensity of metacercarial infection depends on temperature, season, fish-size, abundance of intermediate host, sex, age etc.

CONCLUSION

This survey deals only with the preliminary investigation of the metacercariae found in the fresh water fishes. Their taxonomic positions are yet to be assigned as the authors are still to proceed with the molecular characterisation since the larval stages are of complex nature and the study needs a further investigation.

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REFERENCES

Agarwal, N. and Khan, S. (1982). A new *Diplostomum* Brandes, 1982 metacercaria from the fish *Heteropneustes fossilis*. Indian Journal of Parasitology, 6:81 – 83.

Agarwal, S.M. (1958). Studies on the metacercaria *Clinostomoides dollfusi* (Trematoda : Clinostomoidae) from siluroid fishes. Indian Journal of Helminthology, 10:13-18.

Siddiqui, A. A. and Nizami, W.A. (1982). Kinetic and electrophoretic studies on acid and alkaline phosphatases of metacercariae of *Clinostomum complanatum* (Trematoda : Digenea). Journal of Helminthology, 56: 17 – 22.

Sudarikov, V.E. (1971). Order Strigeidida (La Rue, 1926) Sudarikov, 1959. Part 5. Metacercariae and mesocercariae. In: K.I Skryabin(Ed.), Trematoda of Animals and Man. Nauka, Moscow, 68 – 272.