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PECULIARITIES IN DISTRIBUTION OF *MIZELLEUS INDICUS* JAIN, 1957, ON THE GILLS OF A FRESHWATER CATFISH WALLAGO ATTU (BLOCH & SCHNEIDER)

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An attempt has been made to study the peculiarities in distribution of *Mizelleus indicus* Jain, 1957, on the gills of a freshwater catfish, *Wallago attu* (Bloch & Schneider) with regard to the gill arches, sides of hemibranchs (anterior and posterior) and their sections (dorsal, medial and ventral).

INTRODUCTION

A number of early workers have observed that some parasites have particular preferential sites, where they prefer to attach themselves. Amongst them Cerfontain (1896 & 1898) was the first to record the phenomenon for *Diclidophora denuculata,* a gill parasite of *Polachius virens*. Suydam (1971) has reviewed subsequent accounts (Frankland, 1955; Llewellyn, 1956; Owen, 1963; Wiles, 1968) on spatial distribution of various monogeneans. They defined specific areas of attachment by arbitrarily dividing each gill arch into several regions and the position of the parasite was then indicated with respect to these regions. However, almost all these studies were confined to polyopisthocotylid monogenean whereas our study was related to the peculiarities in distribution of a monopisthocotylid, *Mizelleus indicus* Jain, 1957.

MATERIAL AND METHODS

For the present study, specimens of a freshwater catfish *W. attu* were collected from various sites of river Gomati with the help of fishermen. At times, they were also purchased from the local fish markets. Almost equal number of fishes were examined each month for infection. The fishes were brought to the laboratory and maintained in aquaria after capture. Majority of the fishes were killed by a hard blow on their head and were preserved in formalin to observe the specific location of the parasites. For studying the peculiarities in distribution the gill arches were separated and placed individually in petridishes containing saline water. They were numbered 1-4 anteroposteriorly, sides of hemibranchs were designated as anterior and posterior and each was divided into three subequal sections (dorsal, medial, ventral) thus giving six subequal sections per gill arch (Fig.1). Number of specimens obtained from each section were recorded and the data maintained, thereby recording the precise location of the parasites on the gills.

OBSERVATIONS

Out of 899 specimens of *W. attu* examined, 372 were found infected with *M. indicus*. In all 13351 parasites were recovered. The peculiarities in distribution of these parasites was studied in detail and is described below.

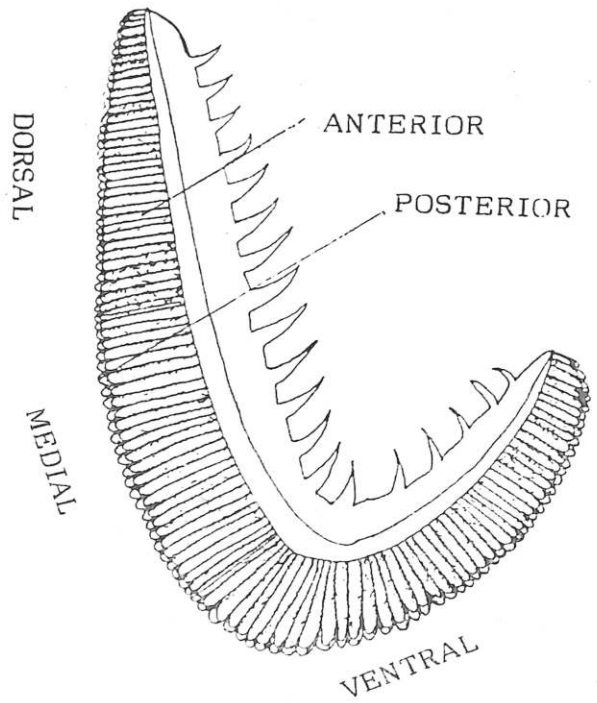

Fig. 1. 1. Gill arch of *W. attu*, showing various divisions.

Arches : These parasites were almost equally distributed in both the gill chambers, right and the left. During the observations, it was found that maximum number of worms were concentrated in the fourth gill arch. The first gill arch had few parasites while the second and the third had none, or at rare occassions only two.

Sides of Hemibranchs : *M. indicus* showed difference in the distribution on the two sides. The posterior side of the hemibranch had greater number as compared to the anterior one. The above mentioned trend was found in the first, second and third gill arches. The fourth gill arch had almost equal distribution of parasites on both the sides. Both the gill chambers followed the same pattern.

Sections of Hemibranchs : These parasites showed affinity for the dorsal sections. In most of the fishes medial and ventral sections remained unoccupied. At rare occassions, few parasites could also be observed in the ventral sections.

DISCUSSION

According to our observations, *M. indicus* showed uniform distribution in both the gill chambers. The preference shown by *M. indicus* for the fourth gill arch and the presence of a few parasites on the first gill arch is similar to *Diclidophora merlangi* (Llewellyn, 1956) which preferred the first gill arch of *Gadus merlangus*. The first gill arches were also preferred by *Dactylocotyle denticulata* (Frankland, 1955) on *Gadus virens* and *Diplozoon paradoxum* (Wiles, 1968) on *Abramis brama*. *M. indicus* showed

different pattern of distribution on the two sides of hemibranchs in being concentrated on the posterior sides mostly, except the fourth gill arch in which the distribution was equal. The parasite also showed special preference for the dorsal sections. According to Suydam (1971), the direction of the ventilating current may influence the position of the parasite on the gills. Since *W. attu* is a freshwater catfish, considering the size and position of the gill arches it is suspected that very less water flows and the current is also very slow in the first and the fourth gill arches, hence *M. indicus* was more prevalent on these gill arches to escape from the water current thereby minimising the chances of getting washed away.

According to Hughes & Morgan (1973), the degree of infection of the gills is directly related to the ventilation volume and the pattern of current flow over the gills. Since the posterior sides and the dorsal sections receive less water and the current is also not very strong, hence preferred by these parasites.

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REFERENCES

CERFONTAIN, P. 1896. Contribution a letude des Octocotylides. *Arch Biol. 14* : 479-560.

1898. Contibution a l'etude des Octocotylides IV. Nouvelles observations sur le genre *Dactylocotyle* et description de *Dactylocotyle luscae. Ibid. 15* : 301-328.

FRANKLAND, H.M.T. 1955. The life history and bionomics of *Diclidophora denticulata* (Trematode : Monogenea). *Parasitology. 45* : 313-351.

HUGHES, G.M. & MORGAN, M. 1973. The structure of fish gills in relation to their respiration function. *Biol. Rev. Cambridge Philos. Soc. 48* : 419-475.

JAIN, S.L. 1957. *Mizelleus indicus* n.g., n.sp. (Subfamily: Tetraonchinae) from the gill filaments of *Wallagonia attu* (Bloch). *Ann. Zool. 2* : 57-62.

LLEWELLYN, J. 1956. The host specificity, microecology and comparative morphology of some trematode gill parasites. *J. Mar. Biol. Assoc. 35* : 127-133.

OWEN, I.L. 1963. The attachment of the monogenean *Diplozoon paradoxum* to the gills of *Rutilus rutilus* L. I. Microhabitat and adhesive attitudes. *Parasitology. 53* : 455-461.

SUYDAM, E.L. 1971. The microecology of three species of monogenetic trematodes of fishes from the Beaufort-Cape Hatteras area. *Proc. Helminthol. Soc. Wash. 38* : 240-246.

WILES, M. 1968. The occurence of *Diplozoon paradoxum* Nordmann 1832 (Trematoda: Monogenea) in certain waters of Northern England and its distribution on the gills of certain Cyprinidae. *Parasitology. 58* : 61-70.