



BIOCHEMICAL AND HISTOPATHOLOGICAL STUDIES OF NEW TAPEWORM MOGHEIA JADHAVEIA IN MILVUS MIGRANS FROM AUSA REGION

Biological Science

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ABSTRACT

The objective of the present study was biochemical analysis and histopathological relation between the new cestode *Mogheia jadhavia* and host *Milvus migrans*. Bio-molecules such as protein, carbohydrates and lipids are determined in parasite and infected host. Result after comparison between cestode parasite and host intestine, protein and glycogen concentration is lower in *Mogheia jadhavia* sp. than host intestine. Lipid content is more in parasite than host intestine. Histopathological relation is good maintain by parasite.

KEYWORDS

Tapeworm, *Milvus Migrans*, *Mogheia Jadhavia*, Biochemical, Histopathology

INTRODUCTION:

In the study of biochemistry and physiology of tapeworm depends largely on the feeding habits of the host. The food of host contains mainly protein, carbohydrate and lipids. These chemical components are essential for normal development and growth of parasite. The protein taken up by diffusion and transfusion. Carbohydrates utilized by parasite as a rich source of energy exogenously by active transport. Lipids act as an energy reserve in cestode.

The largest groups are enzyme proteins provide rich environment for the nourishment of cestodes. Phifer, 1960 and Fisher 1965, when rates were given protein free diet then also *Hymenolepis diminuta*, observe somewhat unfavorable results of the adult worm. Clark, 1968, proves indirect rather than direct influence was probably involve. Ganzalez, V. J. (1978) worked on serum proteins in animal naturally infected with helminth parasites. Comparative investigations of protein composition of *Eubothrium Carassum* and the host tissues are made by Sidorov V. S. (1980). Cestode such as *E. granulosus*, *T. solium*, *D. latum* and so many carried out experiments of protein metabolism.

Weinland's classic work (Weinland, 1901) illustrated that the metabolism of intestinal worm is characterized by the fermentation of carbohydrates. The quantitative values found previous and many recent scientist worked on Schulte, 1971, Von Brand, 1934, Salisbury and Anderson, 1939, Dougherty and Taylor, 1956, Goodchid and Vilar Alrarez, 1962 and others have been obtain by chemical method.

Synthesis of lipids studies in *H. diminuta* (Giner and Fairbrain, 1966). Lipid abundantly found in posterior proglottids (Faorbrain, Wethein Harpur and Schiller, 1961). Glycolipids reported in *M. expansa*, *D. latum*, *H. taeniaefermis* (Brand, T. Von. 1966).

Histopathology, the relation between host and parasite. The extensive study on the host parasite relationship has been carried out by Nandkal, Mohandas, John and Simon (1974), in *Raillietina* (R.) *tetragona*. Histopathology of *Amoebotaenia Indiana* was studied by Mitra and Shinde (1979), Jurasek, V. Ovis Diaz, D. (1981) studied on domestic fowl. Bailey (1951), worked on *H. nana*, Chincholikar and Shinde 1976 in *C. celebesensis*, shina and shina (1986) observed the mode of attachment of *Raillietina* (R.) *tetragona*. Murlidhar and Shinde (1987) observed histopathology of *Acanthobothrium uncinatum* from a fish *Rhynchobatus djeddensis*.

MATERIAL AND METHOD:

Two dozen of intestine of the host Kite, *Milvus* were brought to the laboratory and dissected carefully for collection of parasites. Some of them were found to be heavily infected with the cestode parasites, small pieces of the infected intestine, were also collected to find the protein, glycogen and lipid content in them.

The identical worms were separated and collected at one place by observing them under microscope few of them were kept in 4% formalin for identification. The worms later stained with Harris Haematoxyline and identified as *Mogheia jadhavia* n. sp.

The worms are kept on the blotting paper in order to remove excess of

water then the worms were transfer into a watch glass and wet weight of the worm is noted down. Then material was kept at 100°C for 1 day. Dry weight of the worms were taken and powder is prepared with the help of mortar and pestle, then the tissue, is weighed. The weighed material 349.22 gms on sensitive balance, and it is homogenized in mortar and pestle, with 5 ml. of the sucrose solution, added to this 5 ml of 10% TCA, and then it is centrifuged for 10 minutes, at 2,000 R.P.M. supernatant is discarded and residue is taken in the test tube to this added 1 ml of distilled water and 3 ml of Biuret solution.

The tube was kept for half an hour, until the lavender colour developed. Then this colour was observed to be read on the calorimeter with 530 mu filter to make the optical density to calculate the protein amount.

Similarly, the optical density of unknown solution is taken on calorimeter at 530 mu on filter paper.

The estimation of protein content in the cestode parasites were carried out by Gornall, et al. (1949) method. Estimation of glycogen by Kemp et al (1954) method and lipid by Barner's and Black Stock (1973) method.

DISCUSSION AND RESULT:

The amount of protein in the worm was calculated by the formula:

$$\frac{\text{O.D. of known tissue}}{\text{O.D. of known tissue}} \times \frac{\text{Mg. of protein}}{\text{Wt. of tissue taken}} \times 1000$$

$$\text{O.D. of unknown tissue} = 0.42$$

$$\frac{\text{Mg. of protein}}{\text{Weight of the tissue taken}} = \frac{10}{349.22}$$

$$\frac{0.42 \times 10}{0.58} \times \frac{1000}{349.22}$$

$$= 20.73 \text{ mg/gm weight of the tissue.}$$

The protein percentage of the host intestine, Kite, *Milvus migrans* was estimated by the same procedure, the obtained results showed that the intestine possess 24.98 mg/gm of wet weight tissue of protein.

The result compared showed that the work, *Mogheia jadhavia* obtained 20.73 mg/gm of wet weight tissue of protein from the environment which contained 24.98 mg/gm of wet weight tissue of protein.

Hence it can be concluded that, *Mogheia jadhavia* would maintain a good balance in protein content and the histopathological relation.

Glycogen estimation:

The amount of glycogen in worm thus calculated by the formula:

$$\text{Percentage of glycogen} = \frac{100 \times U}{1.11 \times S}$$

Where U = O.D. of unknown test solution.

S = O.D. of the 100 mg. glucose standard glycogen.

U = 0.40

S = 2

Mg. of Glycogen = $\frac{100 \times 0.40}{1.11 \times 2}$

= 18.01 mg/100 ml solution.

So also same technique has been used for the estimation of the glycogen from the host intestine, when calculated the infected intestine of host has 21.01 mg. of glycogen/gms of intestine.

By studying the result obtained it is seen that the worm *Mogheia jadhavia* is quite successful in obtaining a sufficient amount of glycogen from the environment, percentage difference is seen as the environment contains.

From above it can be concluded that the worms could maintain good balance in glycogen content.

Name of Parameter	<i>Mogheia jadhavia</i> n. sp.	Infected intestine
Protein (mg/g weight of tissue)	20.73	24.98
Glycogen (mg/100 ml of solution)	18.01	21.01
Lipid (mg/gm)	19.03	16.84

Histopathology of the new tapeworm *Mogheia jadhavia*

Twelve intestine of the Kite, *Milvus migrans* were dissected and observed, to see the degree of infection of cestode parasites, some of intestine were heavily infected with the cestode parasites. The pieces of intestine along with attached worms were fixed in fixative, Bouin's fluid taking care that the intact parasites were not disturbed.

After the taxonomic observations the worm turned out to be *Mogheia jadhavia*. Later on the tissue were taken out from the fixative, washed with water, dehydrated, cleared in xylene and embedded in paraffin wax (M.P. 58-60).

The blocks were cut at 7 μ m and slides were stained with Mallory's triple stain. Best slides were selected and observed under the microscope.

OBSERVATION AND DISCUSSION

Microscopic observation revealed that, it bear four suckers without rostellar sac and rostellar hooks but highly muscular which help them adhering to the intestinal tissue. It also observed that, worm were floating near the villi of intestine. The scolex of the worm help it to find attachment in intestine. The worm is able to reach villi of intestine. Due to this attachment it has disturbed the structure of intestine and broken the innermost lining of intestine.

Microscopical observation of sections, revealed that, the immature worm firmly adhere to the mucosal wall and started a pad formation at the base of mucosal wall. It also seen that, the larvae completed the pad formation and damaging the inner lining of mucosal and submucosal layer.

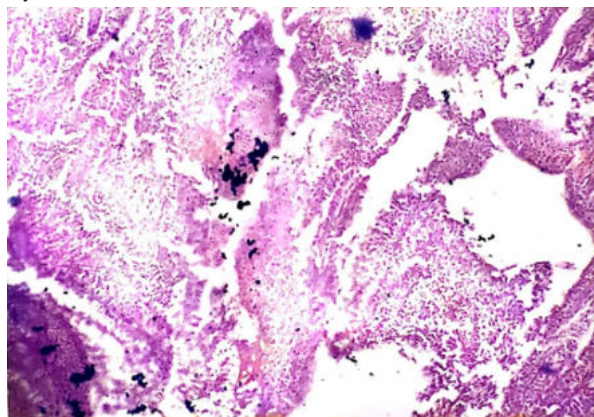


Fig. T. S. of intestine showing damage to the tissue (ulceration) caused due to the invasion of the parasite

It has been observed histochemical that the host tissue is rich in proteins, glucose and lipids, to obtain nourishment. The parasite tries its level best to go deep inside the tissue and here it seeks the help of its scolex. When histochemical studies of the parasite was carried out it brought into the picture the existence of proteins, lipids and glycogen in the scolex region, tegument of the segment.

CONCLUSION :

In present investigation, Cestode parasite *Mogheia jadhavia* n. sp. was carried out for biochemical estimation of primary metabolites such as protein, glycogen and lipid maintain good balance.

It can be concluded that the parasite is quite successful in maintaining good histopathological relationship with the host.

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