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BIOCHEMICAL STUDY OF FRESHWATER FISH CLARIAS BATRACHUS (L.) INFECTED WITH CESTODE PARASITE, LYTOCESTUS, SP. FROM AURANGABAD DISTRICT (M.S.), INDIA.

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ABSTRACT Parasitic biochemistry is a field growing in parallel with the new surge of interest in tropical diseases. Whereas previously parasitologists have been required to adopt biochemical methodology in order to stay abreast of development. Bio-molecules such as protein, glycogen and lipids are determined in parasites and also infected and non-infected intestine of host. Results, after comparison between cestode parasites and host intestine, the protein and glycogen concentration is lower in Lytocestus Sp. as compare to host intestine (infected and non-infected intestine) and lipid concentration is higher than Lytocestus Sp. as compare to host intestine (infected and non-infected intestine). But the protein, glycogen, lipid concentration is higher in non-infected intestine as compare to infected intestine.

KEYWORDS : Aurangabad, *Clarias batrachus*, *Lytocestus*.

INTRODUCTION

Biochemistry is the study of structure, composition and chemical reaction of substances in living systems. Biochemistry emerged as a separate discipline when scientists combined biology with organic, inorganic or physical chemistry and began to study such topics as how living things obtain energy from food, the chemical basis of heredity and what fundamental changes occur in disease. Biochemistry includes the science of molecular biology, immunochemistry, neurochemistry, bioinorganic and biophysical chemistry. Biochemistry is concerned with the study of the chemical processes that occur in living organisms, with the ultimate aim of understanding cell function in molecular term (Keith Wilson and John Walker, 2006). Parasitology has developed into a multi-dimensional approach in helminth research. They serve as valuable models for the study of fundamental biological phenomena. The biochemistry and physiology of Cestode has been comprehensively reviewed by Smyth and McManus (1989) and specific aspects have been reviewed by Arai (1980), Arme and Pappas (1983 a,b), Barratt (1981), McManus (1987) and McManus and Bryant (1986).

The Proteins are absorbed by the parasites by diffusion and transfusion. Proteins have many different biological functions. They are everywhere in their distribution and there is really no satisfactory scheme of classifying them. The largest groups of proteins are the enzyme proteins provide rich environment for the nourishment of cestodes. The cestodes utilize different degrees of protein that producing energy. Literature reveals that the parasites able to adopt themselves to the parasitic mode of life, the protein usually constitutes between 20 to 40 % of the dry weight (John Barrett, 1981).

The glycogen content of various helminthes fluctuates considerably and there is variation in habitat, though no similarity in nutrition of worms. Glucose is an important source of energy for cestodes, inhabiting the alimentary tract of vertebrates (Mishra et al 1945). Cestodes possess stored carbohydrate metabolism, with enormous amount of stored carbohydrate (Daugherty 1956, Fairbairn, Werthein, Harpuret Schiller 1961, Markov, 1943 and Read et Rothman, 1957 b). Cestode parasites stores relatively large quantities of polysaccharides, which in most cases has been assumed to be glycogen (Read 1949 and Reid 1942).

Lipids are of great importance to the body of cestodes as the chief concentrated storage form of energy, besides their role in cellular structure and various other biochemical functions. The higher content of lipid is found in older proglottids (Brand and Van T., 1952).

The present investigation deals with the biochemical studies of freshwater fish *Clarias batrachus* (L.) infected with cestode parasites, *Lytocestus* Sp. From Aurangabad district (M. S.) India.

MATERIAL AND METHODS

Sample Collection

The worms were collected from the intestine of fresh water fish *Clarias batrachus* (L.) and then washed with distilled water. Collected worms were then dried on the blotting paper to remove excess water and transferred to watch glass and weight on sensitive balance. After 50-60^{0}C for 24 hrs. the dry weight was also taken.

Biochemical estimation

The estimation of protein content in the Cestode parasites were carried out by Lowry's method (1951), the glycogen estimation were carried out by Kemp et al. (1954) method and lipid estimation by Folch et al. (1957) method.

RESULT AND DISCUSSION

In the present investigation, Cestode parasites i.e. *Lytocestus* sp. was carried out for biochemical estimation of primary metabolites such as protein, glycogen and lipid (Graph No. 1). It shows that the protein content of worm *Lytocestus* sp. obtained 0.42 ± 0.03 mg/100mg dry wt. of tissue per ml sol^n. Such as infected as well as non-infected intestine of fresh water fish *Clarias batrachus* (L.) obtained 0.58 ± 0.02 mg/100mg dry wt. of tissue per ml sol^n and 0.68 ± 0.03 mg/100mg dry wt. of tissue per ml sol^n respectively. Protein content is lower in cestode parasites as compare to host (Asawari Fartade, 2011 and Amol Thosar et al., 2014). Rajkumar T. Pawar, 2020 observe that protein content is higher in cestode parasite i.e. *Lytocestus vyasaeiare*, Pawar, 2011 as compare to the host.

The glycogen content of *Lytocestus* sp. obtained 0.15±0.004 mg/100mg dry wt. of tissue per ml sol^n. Such as infected as well as non-infected intestine of fresh water fish *Clarias batrachus* (L.) obtained 0.17±0.006 mg/100mg dry wt. of tissue per ml sol^n and 0.22±0.019 mg/100mg dry wt. of tissue per ml sol^n respectively. Glycogen content is lower in cestode parasite as compare to infected and non-infected intestine of host (Rajkumar T. Pawar, 2020 and Asawari Fartade, 2011). Glycogen content is higher in cestode parasite as compare to

infected and non-infected intestine of host (Amol Thosar et al., 2014).

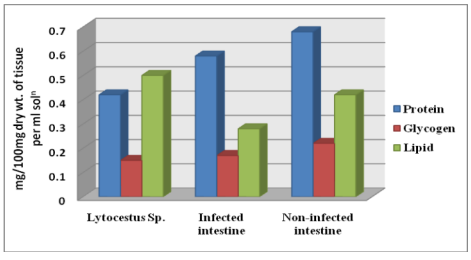
While the lipid content of *Lytocestus* sp. obtained 0.50±0.01 mg/100mg dry wt. of tissue per ml sol^{n}. Such as infected as well as non-infected intestine of fresh water fish *Clarias batrachus* (L.) obtained 0.28±0.015 mg/100mg dry wt. of tissue per ml sol^{n} and 0.42±0.13 mg/100mg dry wt. of tissue per ml sol^{n} respectively. Lipid content is higher in Cestode parasites as compare to host intestine (Rajkumar T. Pawar, 2020 and Asawari Fartade, 2011). Lipid content is lower in Cestode parasites as compare to host intestine (Amol Thosar et al., 2014).

From the present experimental study it has been observed that the lipid content is high in cestode parasites as compared to protein and glycogen. These parasites absorbing most of nourishing from host and fulfilling its need causing hindrance in the proper development of tissue (B. V. Jadhav et al. 2008).

Table No. 1: Biochemical estimation of fresh water fish *Clarias batrachus* (L.) intestine and cestode parasite i.e. *Lytocestus* Sp.

Name of Parameter	Lytocestus Sp.	Intestinal tissue of Clarias batrachus (L.)	
		Infected	Non-infected
Protein (mg/100mg dry wt. of tissue per ml soln)	0.42 ± 0.03	0.58 ± 0.02	0.68 ± 0.03
Glycogen (mg/100mg dry wt. of tissue per ml soln)	0.15±0.004	0.17±0.006	0.22±0.019
Lipid (mg/100mg dry wt. of tissue per ml soln)	0.50±0.01	0.28±0.015	0.42±0.13

Graph No. 1: Biochemical estimation of fresh water fish Clarias batrachus (L.) intestine and cestode parasite i.e. Lytocestus Sp.



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