

## Biochemical studies of *Circumoncobothrium* (Shinde 1968) tapeworm in freshwater fish *Mastacembelus armatus*

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### Abstract

Parasitic biochemistry has great practical importance through chemotherapy and vaccine production and in understanding of the complex association involved in the host parasite relationship. However, information in parasite biochemistry is patchy. The present study deals with the biochemistry (Protein, glycogen, lipid) of parasites *circumoncobothrium* in fresh water fish *Mastacembelus armatus*, Collected from fresh water fish. *circumoncobothrium* parasites are the most pathogenic cestode parasites.

**Keywords:** Cestode parasite, Biochemistry, *circumoncobothrium*, *Mastacembelus armatus*.

### INTRODUCTION

In aquaculture the health of fish is of at most important. The health of fish can be affected by environmental factors, nutrition as well as by pathogens. The presence of large population of a particular species of fish provides. Glucose is an important source of energy for cestodes, inhabiting the alimentary tract of vertebrates (Mishra et al 1945 [1]). Glycogen is the main reserve food product in the cestode; (Markov 1939, 1943 [2]) used the glycogen and fat contents as criteria of starvation or nutrition Cestode. Parasites stores relatively large quantities of polysaccharides, which in most cases has been assumed to be glycogen (Read 1949 b & Reid 1942 [3]).

Proteins have many different biological functions. The largest groups of proteins are enzyme portions provide rich environment for the nourishment of cestode. (Sushil Jawale 2011 [4]) the higher protein in the host indicated the balance between the parasite and the host tissue osmotic concentration (S.B.Waghmare 2010 [5]). Literature reveals that the parasites able to adopt themselves to the parasitic mode of life, the protein usually constitutes between 20 and 40 % of the dry weight (John barrett 1981). The higher content of lipid is found in older proglottids (Brand and Van T., 1952). The present investigation deals with the biochemical studies of *circumoncobothrium* parasites in fresh water fish *Mastacembalus armatus*.

### MATERIAL AND METHODS

The worms were collected from the alimentary tract of *Mastacembalus armatus* 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 weighed on sensitive balance. After 50-60 c for 24 hrs. The dry weight wt. was also taken. The estimation of protein content in the cestode parasites were carried out by Lowry's method, the glycogen estimation were carried out by Kemp et al. (1954) [6] method and lipid estimation by Folch et al (1957) [7] method.

Table 1. Biochemical estimation of *Circumoncobothrium* (Shinde, 1968) from *M. armatus*

Name of Parameter	Host Intestine ( <i>M. armatus</i> )	Parasite( <i>Circumoncobothrium</i> )
Protein	20.02 mg/gm. wt. of tissue	12.7 mg/gm. wt. of tissue
Glycogen	22.52 mg/gm. wt. of tissue	11.02 mg/gm. wt. of tissue
Lipid	12.04 mg/gm. wt. of tissue	16.8 mg/gm. wt. of tissue

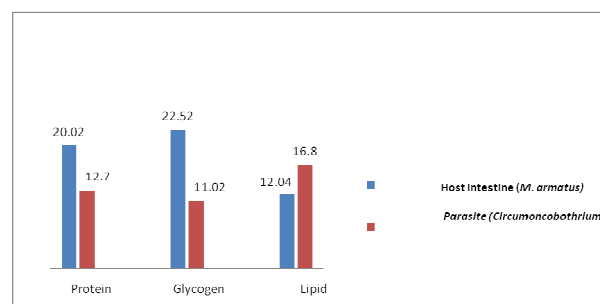


Fig. Biochemical estimation of *Circumoncobothrium* (Shinde, 1968) from *M. armatus*

### RESULT AND DISCUSSION

Biochemical estimation in cestode parasites i.e. *Circumoncobothrium* are expressed in terms of unites and that are shown in table no.1. Table no. 1 shows that the worm *circumoncobothrium*. Obtained 12.7 mg/gm of protein from the wet weight of the tissue where as in host intestine 20.02 mg/gm of the wet weight of the tissue hence it can be concluded that the *circumoncobothrium*. Would maintain a good balance in protein

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content with their host *M. armatus*. The glycogen content of *circumcobotrium* showed 11.2 mg/100 ml of solution where as in host intestine 22.52 mg/100 ml of solution. Observing the results it is seen that the worm *circumcobotrium* sp. is quite successful in the obtaining a sufficient amount of glycogen. Whereas the the lipid content was very high in *circumcobotrium* 16.8 mg/gm as compaired to their host *M. armatus* 12.04 mg/gm. The

The study was also done regarding the characteristic of glycogen and fat store in the tissue of some fish helminths, regarding their localization in the body of the host. (Ginetsinhaya 1965 [8]). Fluctuation in the glycogen content from cestode, *Hymenolepis diminuta* also studied. (Read, C. P. 1949b).The study on the *Hymenolepis diminuta* was also done in relation to the glycogenesis and biochemistry.(Daugherty, J.W. 1956 and Fairbairn, D.G. et al.,1961).The study on role of carbohydrate in the biology of cestode done from *Hymenolepis diminuta* (Read, C. P.et al.,1957b) From the above biochemical estimation it is concluded that the percentage of lipid is high parasites as compaired to protein and glycogen. These parasites absorbing most of nourishing from host and fulfilling its need and causing hindrance in the proper development of tissue (B. V. Jadhav et.al. 2008)

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#### REFERENCE

- [1] Kemp. A. Vankits AND Haljningem A.J.M. 1954. A colorimetric method for the determination of glycogen in tissue. *Biochem. J.* 646-648.
- [2] Folch, J., Lees, M. & Sloane-Stanley, G. H. 1957. Chromatographic separation of brain lipids: cerebroside and sulphatide
- [3] Ginetsinhaya, T. A. AND Usponskaya, E. I. 1965. The characteristic of glycogen and fat store in the tissue of some fish helminthes, regarding their localization in the body of the host. *Helminthologia*, 6: 319-333.
- [4] B. V. Jadhav et.al. 2008. Biosystematic studies of *Davainea shindei* n.sp. (Cestoda: Davainidae Fuhrmall, 1907) from *Gallus gallus domesticus*. *NATL ACAD sci Lett*, Vol.31, NO. 7-8, 2008.
- [5] Mishra et. al., 1945. On a new specis of the genus *Oochoristica* from the intestine of *Calotes versicolor*. *proc.Ind. Acad.Sci.*, section B22:1-5.
- [6] Markov, G.S. 1943. The dynamic of reserve nutritive substances in parasitic worms in artificial media.
- [7] Reid, W.M. 1942. Certain nutritional requirements of the fowl cestode, *Raillietina cesticillus* (Molin) as demonstrated by short periods of starvation of the host. *J. Parasitol.* 28: 319-340
- [8] Sushil Jawale 2011. Biochemical studies of *Caryophyllidean* tapeworms in fresh water fish *clarias batrachus*. *Recent Research in Science and Technology 2011*, 3(3): 06-08 ISSN: 2076-5061
- [9] S.B.Waghmare. 2010. Biochemical aspects from *Gallus gallus Domesticus* with special reference to cestodes ( Ph.D thesis of Dr. B.A.M.University Aurangabad)