



BIOCHEMICAL ESTIMATION OF THE CESTODE PARASITE, *MONIEZIA SP.* FROM *CAPRA HIRCUS (L.)* IN MARATHWADA REGION (M.S.) INDIA

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ABSTRACT

The *Moniezia sp.* of the cestode parasite isolate from the small intestine of the *Capra hircus (L.)* which is collected from the Marathwada region. The parasitic biochemistry of the *Moniezia sp.* done with the help of different methods such as 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) methods are used. It shows that the protein content of worm *Moniezia, Sp.* obtained 0.23 ± 0.011 mg/100 mg dry wt. of tissue per ml solution. Such as infected as well as non-infected intestine of *Capra hircus (L.)* obtained 0.32 ± 0.028 mg/100 mg dry wt. of tissue per ml solution and 0.36 ± 0.012 mg/100 mg dry wt. of tissue per ml solution respectively and the glycogen content of *Moniezia, Sp.* obtained 0.14 ± 0.008 mg/100 mg dry wt. of tissue per ml solution. Such as infected as well as non-infected intestine of *Capra hircus (L.)* obtained 0.11 ± 0.004 mg/100 mg dry wt. of tissue per ml solution and 0.15 ± 0.009 mg/100 mg dry wt. of tissue per ml solution respectively while the lipid content of *Moniezia, Sp* obtained 0.058 ± 0.013 mg/100mg dry wt. of tissue per ml solution. Such as infected as well as non-infected intestine of *Capra hircus (L.)* obtained 0.75 ± 0.050 mg/100mg dry wt. of tissue per ml solution and 0.84 ± 0.048 mg/100mg dry wt. of tissue per ml solution respectively. It is concluded that the percentage of lipid is high parasites as compared to protein and glycogen of the parasite.

KEYWORDS : Biochemistry, *Capra hircus (L.)*, Cestode Parasite, *Moniezia Sp.*

INTRODUCTION

The Cestodes are a group of endoparasitic helminths which almost exclusively occupy the alimentary canal in preference to other common sites like the bile duct, the gall bladder or the pancreatic duct (Smyth and McManus 2007). The elongated tape-like body of the cestode enables it to live in its tubular habitat (Smyth and McManus 2007). Biochemistry includes the sciences of molecular biology, immunochemistry, and 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).

The four main types of biomolecules are carbohydrates, lipids, protein and nucleic acids. Many biological molecules are relatively small micromolecules that are linked together to create large macromolecules known as polymers. When monomers are linked together to synthesize a biological polymer, they undergo a process called dehydration synthesis (Keith Wilson and John Walker, 2006).

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. Carbohydrates are the most commonly used source of energy in cestode (Cheng, 1986). Glucose is an important source of energy for cestode, 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, 1957b). 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 the protein 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 *Capra hircus (L.)* infected with cestode parasites *Moniezia, Sp.* from Marathwada region (M. S.) India.

MATERIAL AND METHODS

A. Sample Collection:-

The worms were collected from the intestine of *Capra hircus (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 °C for 24 hours the dry weight was also take. 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) methods are used.

B. Biochemical estimation

1. Protein estimation by Lowry's method (1951).

Take a clean test tube and place them in a test tube rack. In each test tube carefully pipette one of the following volume of solution of bovine serum albumin (BSA) 0.01, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 ml. Bring the total volume of liquid in each. Take to 1 ml by adding on appropriate amount of distilled water. Mix thoroughly 15 ml reagent A, 0.75 ml reagent B and 0.75ml Reagent C in a 50 ml flask. At the conclusion of the incubation period pipette out 0.5 ml folin's phenol reagent into each tube vertex the solution immediately incubate the sample at room temperature for 30 minutes. Determine the optical density at 660 nm. (Setting to colorimeter to zero density with blank). Now plot the reading on the graph paper to obtain the standard graph. (Test sample should always be assayed using procedure identical to those employed for the standard graph).

2. Glycogen estimation by Kemp, et al., (1954) method

Take 100 mg with tissue add 1 ml of 30% KOH. Boil it for 3 to 5 minutes in boiling water bath till tissue completely dissolve. Cool it at room temperature at 0.2 ml of 2% Na₂SO₄ solution. Add 60 ml of absolute alcohol keep it for overnight in refrigerator then centrifuge the for about 15 minutes at 3000 RPM discard the supernatant and dry the residue. Dilute the residue make by adding 10 ml distilled water. Take 0.2 ml supernatant then add 0.9 ml distilled water and also add 4ml anthrone reagent (fresh prepared). Heat for 5 minute in boiling water bath, cool it at room temperature and read optical density at 620 nm.

3. Lipid estimation by Folch, et al., (1957) methods

Take 100 mg tissue sample homogenize it in Mortal and Pistal by adding 10 ml mixture of Chloroform: Methanol (2:1) and take 1 ml filtrate and keep it for a drying that is evaporation of mixing of chloroform and methanol at 37°C for 3 to 4 days at room temperature. Add 1 ml of H₂SO₄ concentrated and then boil it for 10 minute in boiling water bath. Take 0.2 ml above solution and add 5ml vanillin reagent with for 30 minutes for development of colour. Read the optical density at 540nm.

RESULT AND DISCUSSION

In the present investigation, Cestode parasites i.e. *Moniezia*, 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 *Moniezia*, Sp. obtained 0.23± 0.011 mg/100mg dry wt. of tissue per ml solution. Such as infected as well as non-infected intestine of *Capra hircus* (L.) obtained 0.32±0.028 mg/100mg dry wt. of tissue per ml solution and 0.36± 0.012 mg/100 mg dry wt. of tissue per ml solution 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 vyasaee*, Pawar, 2011 as compare to the host.

The glycogen content of *Moniezia*, Sp obtained 0.14±0.008 mg/100 mg dry wt. of tissue per ml solution. Such as infected as well as non-infected intestine of *Capra hircus* (L) obtained 0.11± 0.004 mg/100mg dry wt. of tissue per ml solution and 0.15± 0.009 mg/100 mg dry wt. of tissue per ml solution 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 *Moniezia*, Sp obtained 0.058±0.013 mg/100 mg dry wt. of tissue per ml solution. Such as infected as well as non-infected intestine of *Capra hircus* (L) obtained 0.75± 0.050 mg/100mg dry wt. of tissue per ml solution and 0.84± 0.048 mg/100 mg dry wt. of tissue per ml solution 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).

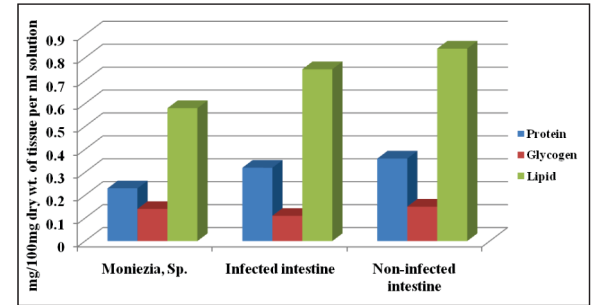
From the present experimental study it has been observed that the lipid content is high in cestode parasites as compared to protein and glycogen. These parasites absorbing most of nourishing from host and fulfilling its need causing hindrance in the proper development of tissue (B.V. Jadhav, et al.,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

Table No. 1: Biochemical estimation of *Capra hircus* (L) intestine and cestode parasite i.e. *Moniezia*, Sp

Name of parameter	<i>Moniezia</i> , Sp.	Intestine of <i>Capra hircus</i> (L.)	
		Infected	Non-infected
Protein (mg/100mg dry wt. of tissue per ml solution)	0.23±0.011	0.32±0.028	0.36±0.012
Glycogen (mg/100mg dry wt. of tissue per ml solution)	0.14±0.008	0.11±0.004	0.15±0.009
Lipid (mg/100mg dry wt. of tissue per ml solution)	0.58±0.013	0.75±0.050	0.84±0.048

Protein (mg/100mg dry wt. of tissue per ml solution)	0.23±0.011	0.32±0.028	0.36±0.012
Glycogen (mg/100mg dry wt. of tissue per ml solution)	0.14±0.008	0.11±0.004	0.15±0.009
Lipid (mg/100mg dry wt. of tissue per ml solution)	0.58±0.013	0.75±0.050	0.84±0.048

Graph No. 1: Biochemical estimation of *Capra hircus* (L) intestine and cestode parasite i.e. *Moniezia*, Sp



CONCLUSION

From the above biochemical estimation of the *Moniezia* Sp. from *Capra hircus* (L.) in Marathwada region (M.S.) India. It is concluded that the percentage of lipid is high parasites as compared to protein and glycogen. The *Moniezia* Sp. of the *Capra hircus* (L.) is absorbing most of nourishment from host and fulfilling its need and causing hindrance in the proper development of tissue.

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