UTTAR PRADESH JOURNAL OF ZOOLOGY

43(14): 74-77, 2022
ISSN: 0256-971X (P)

STUDY OF BIOCHEMICAL COMPONENTS OF CESTODE PARASITES FROM *Capra hircus* (L) IN SOLAPUR DISTRICT (M.S), INDIA

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.56557/UPJOZ/2022/v43i143118

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Received: 15 June 2022
Accepted: 03 August 2022
Published: 09 August 2022

Original Research Article

ABSTRACT

In biochemistry, the study of biomolecules such as proteins, glycogen and lipids, are very important in each and every organism. A cestode parasite absorbs all nutritive biomolecules from the body host. In the present study cestode parasites, infected intestine and non-infected intestine of the host are determined by biomolecules such as protein, glycogen, and lipid. The estimation of protein content in the cestode parasites and host intestinal tissue (infected and non-infected) were carried out by Lowry's method [1], glycogen estimation by Kemp A. Vankits and Haljnimgem A.J.M., [2] and lipid estimation by Folch, J., Lees, M. and Sloane-Stanley, G. H., [3] method. Results, after comparison between cestode parasites i.e. *Moniezia* Sp. and host intestine (non-infected and infected intestine of host *Capra hircus(*L) indicates that the protein and lipid concentration is lower whereas the glycogen concentration is higher in *Moniezia Sp.* as compare to host intestine.

Keywords: Biochemistry; *Capra hircus* (L); Moniezia; Solapur.

1. INTRODUCTION

Biochemistry is the study of chemical reaction in living tissues, both cells and in intercellular media or is the science concerned with various biomolecules that occur in the living cells and organisms and their chemical reaction. In biomolecules that are formed in living organisms that include carbohydrates, proteins, lipids, nucleic acid, minerals, vitamins, water. All are composed of atoms.

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Proteins are of high nutritional value and are directly involved in the chemical process essential for life. Protein is a large biomolecule and macromolecule that comprise one or more long chain of amino acid residues.

"The glycogen has been reported to be one of the most important energy reserves in cestodes" [4]. "Glucose is an important source of energy for cestodes, inhabiting the alimentary tract of vertebrates" [5]. "Cestodes possess stored carbohydrate metabolism, with enormous amount of stored carbohydrates" [6,7], (Markov, 1943) [8]. "Cestode parasites stores relatively large quantities of polysaccharides, which in most cases has been assumed to be glycogen" [9,10].

The lipid contents of the cestodes are highly variable [4]. Simple lipids and conjugated lipids from cestode have been reported by Smyth and McManus 2007. "The higher content of lipid is found in older proglottids" [11]. Lipids are of great importance to cestodes body as the chief concentrated storage form of energy, besides their role in cellular structure and various other biochemical functions [12].

The study deals with the biochemical studies of *Capra hircus* (L.) infected with cestode parasites from Solapur District (M. S.) India.

2. MATERIALS AND METHODS

Sample Collection: Cestode parasites were collected from the intestine of *Capra hircus (*L) from Solapur district. The samples were preserved in 4% formalin for taxonomic study and some were kept on blotting paper to remove excess of water. The material was transferred to a previously weighed watch glass and weighed on a sensitive balance. The wet weighed of the tissue is taken and kept in an oven at 50-60C for twenty-four hours to make the material dry. The dry weight of the material was taken and macerated into powder.

Biochemical Estimation: The estimation of protein content in the cestode parasites and host intestinal tissue (infected and non-infected) were carried out by Lowry's method [1], glycogen estimation was done according to Vankits and Haljnimgem [2] and lipid estimation according to Folch, Leesand Sloane-Stanley [3] method.

3. RESULTS AND DISCUSSION

The protein, glycogen and lipid content of cestode parasites i.e. *Moniezia* Sp. and infected and non-infected tissue from host *Capra hircus* (L) is calculated by statistical analysis (Table 1).

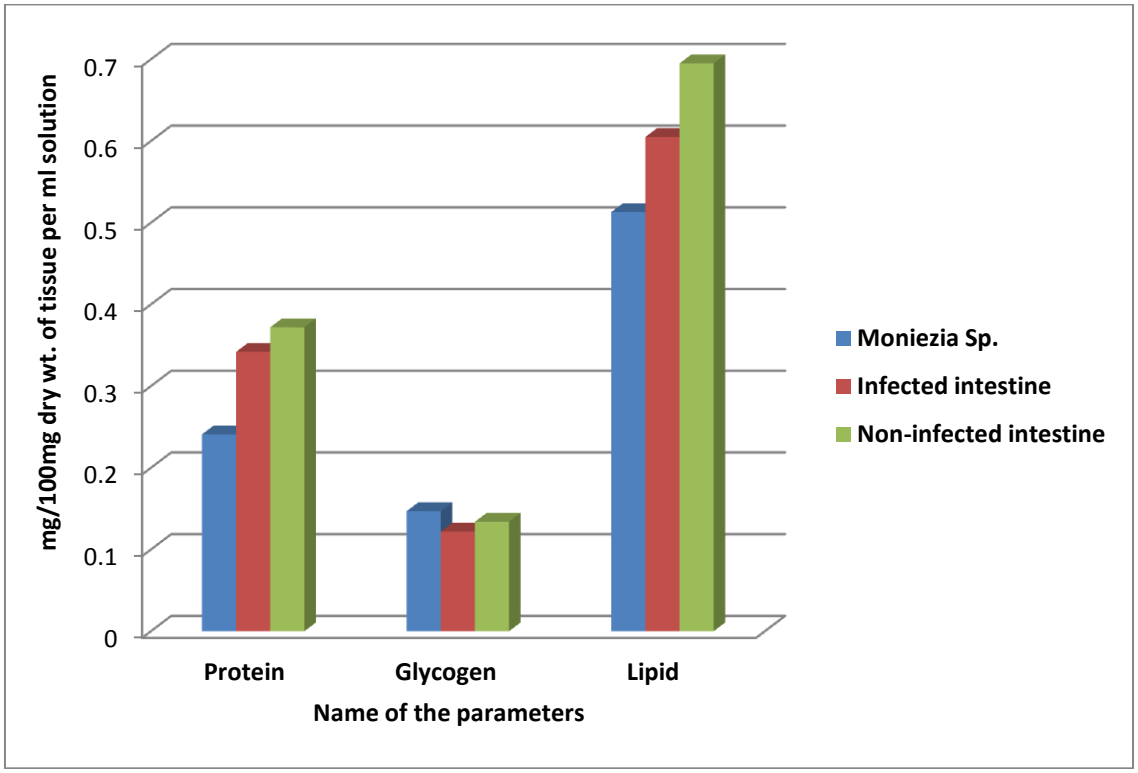
From the above biochemical estimation the protein content in cestode parasites that is *Moniezia* sp. (0.241±0.013 mg/100 mg dry wt. of tissue per ml solution) is lower than infected (0.342±0.014 mg/100 mg dry wt. of tissue per ml solution) and non infected (0.372±0.003 mg/100 mg dry wt. of tissue per ml solution) intestine of host *Capra hircus* (L).

The glycogen concentration in *Moniezia* Sp. (0.147±0.013 mg/100 mg dry wt. of tissue per ml solution) was higher than infected (0.122±0.002 mg/100 mg dry wt. of tissue per ml solution) and non-infected (0.134±0.003 mg/100 mg dry wt. of tissue per ml solution) intestinal tissues of host *Capra hircus* (L).

In lipid estimation it shows that the cestode parasites *Moniezia* Sp. (0.513±0.04 mg/100 mg dry wt. of tissue per ml solution) was lower than infected (0.605±0.038 mg/100 mg dry wt. of tissue per ml solution) and non-infected (0.695±0.043 mg/100mg dry wt. of tissue per ml solution) intestinal tissue of *Capra hircus* (L).

Table 1. Protein, glycogen and lipid contents (mg/100 mg of dry tissue) of cestode parasites i.e. *Moniezia* Sp. and infected and non-infected intestinal tissues of host *Capra hircus* (L)

Name of parameters	Cestode parasites i.e. *Moniezia* Sp.	Host intestinal tissue	
		Infected intestine	Non-infected intestine
Protein (mg/100 mg dry wt. of tissue per ml solution)	0.241±0.013	0.342±0.014	0.372±0.003
Glycogen (mg/100 mg dry wt. of tissue per ml solution)	0.147±0.013	0.122±0.002	0.134±0.003
Lipid (mg/100 mg dry wt. of tissue per ml solution)	0.513±0.04	0.605±0.038	0.695±0.043



Graph 1. Protein, glycogen and lipid contents (mg/100 mg of dry tissue) of cestode parasites i.e. *Moniezia* Sp. in infected and non-infected intestinal tissues of host *Capra hircus* (L)

Atul et al. [13], Sonune [14], Amol et al. [15] and Jivan et al., [16] reported that the protein concentration is lower in *Moniezia* Sp. than infected and non-infected intestine of host,as well as lipid concentration is lower in *Moniezia* sp. than infected and non-infected intestines of host. Present work also shows similar type of results.

Atul et al. [13], Amol et al. [17] and Jivan et al. [16] reported that glycogen concentration is higher in *Moniezia* Sp. than infected and non-infected intestine of host. Sonune [14] also reported that glycogen concentration is lower in *Moniezia* sp. than in infected and non-infected intestine of host Rajkumar [18] and Jawale et al. [19] shows "glycogen content is lower in *Monezia* Sp. than in infected and non-infected intestines of host".

4. CONCLUSION

1. From the above observation it is concluded that the lipid content in cestode parasites i.e. *Moniezia* sp. has been found higher as compared to protein and glycogen.
2. It can be concluded that the cestode parasites i.e. *Moniezia* sp. could maintain a good balance in protein, lipid and glycogen with its host *Capra hircus* (L).

ACKNOWLEDGEMENT

Author is thankful to the head Department of zoology, Dr. B. A. M. University, Aurangabad for providing the laboratory facilities during research work.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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