iJRASET
International Journal For Research in Applied Science and Engineering Technology



# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

**Volume:** 10 **Issue:** VI **Month of publication:** June 2022

**DOI:** https://doi.org/10.22214/ijraset.2022.45000

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538*
*Volume 10 Issue VI June 2022- Available at www.ijraset.com*

# Biochemical Studies on Cestode Parasites *Cotugnia jadhavii* in *Gallus Gallus Domesticus* from Nashik District, M.S (India)

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***The present investigation deals with the biochemical estimation of cestode parasite Cotugnia jadhavii and its host tissue i.e. normal and infected intestinal tissue of Gallus gallus domesticus in Nashik district. The result obtained an amount of glycogen and protein percentage is low in parasite but the amount of lipid percentage is high in parasite as compared to their hosts.***
***Keywords: Biochemistry, Gallus gallus domesticus, cotugnia jadhavii, Nashik District.***

## I. INTRODUCTION

Poultry meat production growth rate is fastest recorded in India. Poultry consider as agro based cottage industry in the world has recorded from last 4 decades. Intensive rising of poultry in commercial farms inevitably exposes flock to the various diseases which cause mortality and loss to the farmers. Diseased birds can also be hazardous to the human health; there may be possibilities of damage to the human body due to intake of diseased birds.

In animal husbandry now a day's farmer reared the *Gallus gallus domesticus* bird for allied business but due to parasitic infection birds are not well developed. Many problems of helminth impact on the body of animal host in natural population remain unstudied. This is also true for the domesticated bird *Gallus.* Some negative impact of parasites on their host is assumed a prior; however little valid data available on its physiological mechanism.

Parasitism is a natural way of life, among the large number of organism and parasitic diseases are the major public health problem, which results into morbidity and mortality in tropical countries, particularly in the socio economically under developed societies in the world. Tapeworms completely lack alimentation in all stages of life history. The cestode parasites utilize the food from the intestinal gut of host. The metabolism depends on the feeding habits and the rich nourishment available in the gut of the host. The parasites use this nourishment for their normal development and growth.

Glucose is an important source of energy for cestodes, inhibiting the alimentary tract of vertebrates (Mishra et al 1991). Cestode possess stored carbohydrate metabolism, with enormous amount of store carbohydrate (Daughtery 1966, Fairbairn, Werthein, Harpuret Schiller 1961, Read 1957b) cestode parasites stores relatively large quantities of polysaccharides, which in most cases has been assumed to be glycogen (Reid 1942).

Proteins have many different biological functions. Proteins are fundamental units for all metabolic activities; they are most important agents for expression of the genetic material. Proteins are the most abundant organic molecules in cells constituting 50 percent or more of their dry body weight. They are found in every part cell; since they are fundamental in all aspects of cell structure and function. The proteins are absorbed by the parasites by diffusion and transfusion. They are ubiquitous in their distribution and there is really no satisfactory scheme of classifying them. The largest gr. of proteins is the enzyme proteins provide rich environment for the nourishment of cestodes. The cestodes utilize different degrees of protein for producing energy. John Barett reveals that the parasite able to adapt themselves to the parasitic mode of life, only due to protein (John Barett 1981).The higher content of lipid is found in older proglottids (Brand and Vant 1952). It is revealed from the present study that there is high content of lipids in the parasites and also the parasites are taking advantages of host and absorbing most of the nourishing materials. There are various workers who work on the impact of helminth on host organism Pronina and Pronin, Kuklina and V.V.Kuklin, Silkina and Mikryakov, etc.

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## II. MATERIALS AND METHODS

The worms were collected from the alimentary tract of *Gallus gallus domesticus* and then washed with distilled water. collected worms were dried on the blotting paper keeping them to remove excess water and transformed to watch glass and weighed on sensitive balance. After 50-60 $^{o}$C for 24hrs, the dry weight was also taken. The estimation of protein content in the cestode parasites were carried out by Lowrys method (1951) the glycogen estimation was carried out by Kemp *et al.* (1954) method and lipid estimation by folch et al (1957) method.

### *A. Observations*

| Sr.No. | Tissue | Glycogen (mg/ml of sol.) | Protein mg/gm wt. of tissue) | Lipid mg/gm |
|---|---|---|---|---|
| 1 | Normal Intestine | 18.37 | 21.55 | 13.80 |
| 2 | Infected Intestine | 17.22 | 19.34 | 13.65 |
| 3 | *Cotugnia jadhavii* | 11.20 | 13.45 | 14.20 |

Table No.1: Biochemical contents in the intestine of *Gallud gallus & Cotugnia*

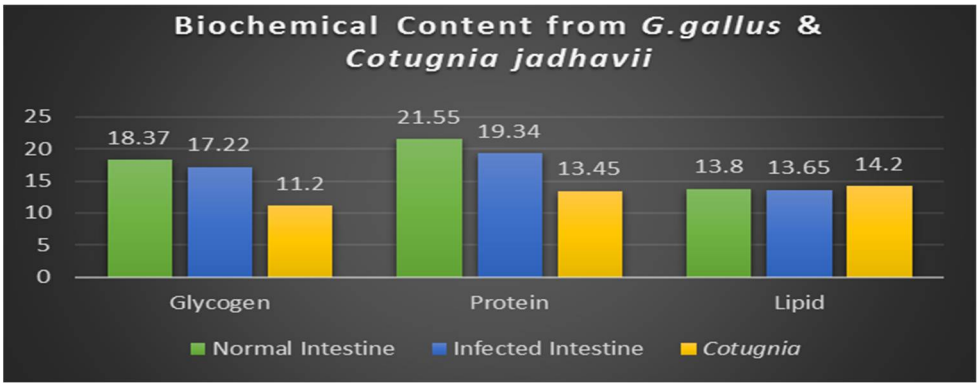



Chart No 1: Biochemical Content from normal and Infected *Gallus gallus domesticus & Cotugnia jadhavii.*

## III. RESULT AND DISCUSSION

The quantitative values of biochemical estimation in *cotugnia jadhavii* shown in the table no 1. It shows that the amount of protein present in the host intestine is 21.55 mg/gm of the wet weight of tissue. While in parasite 13.45 mg/gm wet weight of tissue. Hence it can be concluded that *cotugnia jadhavii* would maintain a good balance in protein content with their host *Gallus gallus domesticus*. Glycogen content in *cotugnia jadhavii* showed 11.20 mg/100 ml of solution of the tissue where as in host intestine 18.37 mg/100ml of solution and infected intestine shows 17.22 mg/100ml of solution. Observing the result, it is seen that the worm *cotugnia jadhavii* is quite successfully in obtaining a sufficient amount of glycogen. Lipid content in *cotugnia jadhavii* showed 14.20 mg/100 ml of solution of the tissue where as in host intestine 13.80 mg/100ml of solution and infected intestine shows 13.65 mg/100ml of solution. Observing the result, it is seen that the worm has higher amount of lipid as compare to its host. *cotugnia jadhavii* is quite successfully in obtaining higher amount of lipid. In few cestodes developmental history changes the growth of parasites is rapid at the first 18-24 hrs and then slows down even if the concentration is high as it was in the early stage.

The similar result also reported by Jadhav et.al. from *Davainea shindei* amount of protein present in *Davainea shindei* 13.20 mg/mg wt. of tissue where as in host intestine is 15.42 mg/mg of tissue. The distribution of protein content shown in the present study is an agreement with the result of Jadhav et.al, 2007, Nanware *et.al*., 2010, and Bhure *et.al*, 2011

Study indicates that the amount of proteins present in cestode parasites is lower as compared to protein present in infected intestine as well as in host normal and infected intestine. This is summarized in table no. 1.

The total protein content of Acanthocephalon parasites *Pallisentis nagpurensis* shows the female parasites were having higher protein content then males.

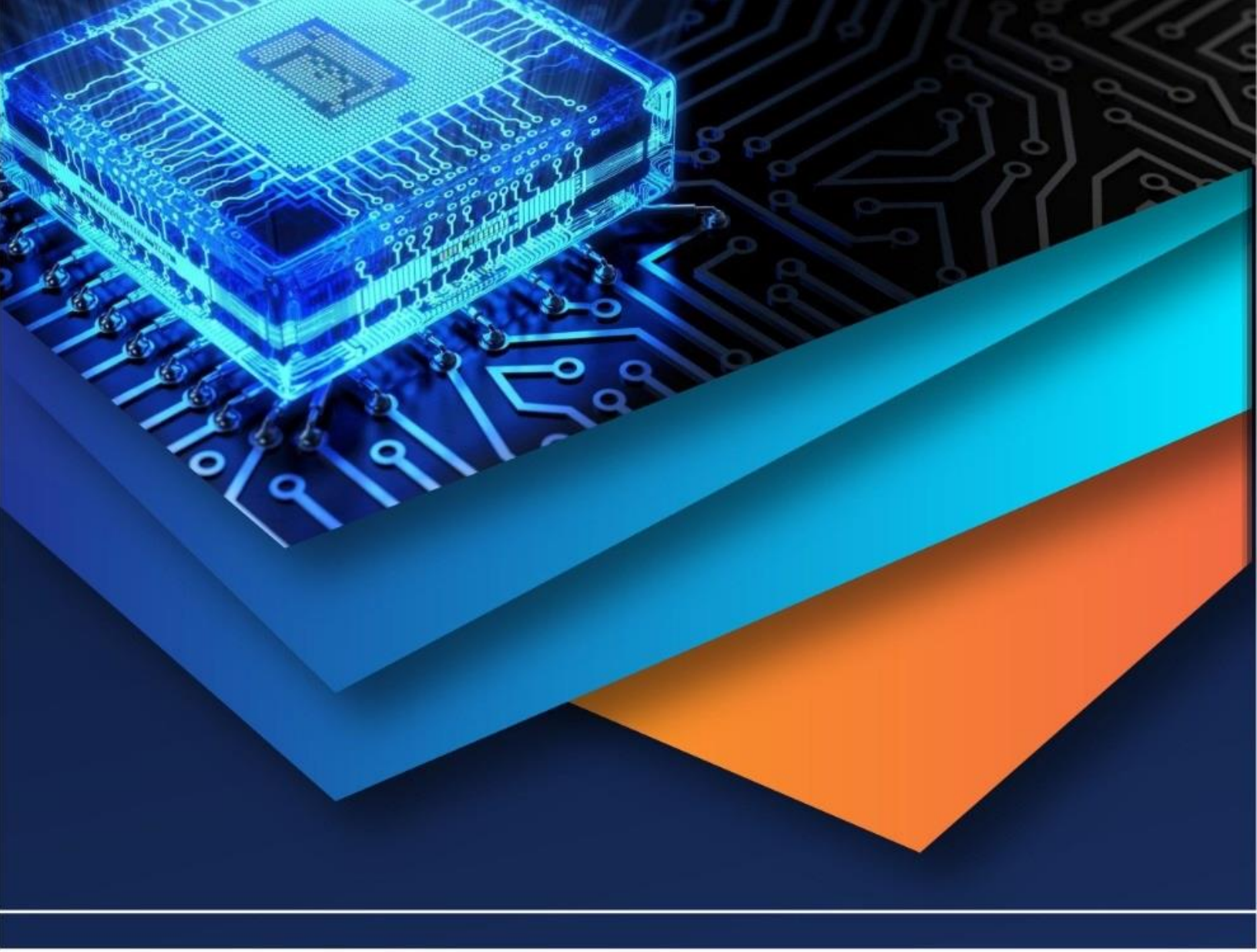
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## IV. CONCLUSION

From above biochemical estimation, it is concluded that amount of protein and glycogen in Parasite *Cotugnia jadhav*ii found lower as compare to host while the amount of lipid is higher than the host Gallus gallus domestics**.**

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