



# Bio-chemical analysis of *Cotugnia mohekarae* n. sp. from Columba Livia intermedia

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## Manuscript details:

Received : 04.11.2017  
Revised ; 04. 12.2017  
Accepted : 23.04.2018  
Published : 28.04.2018

**Editor: Dr. Arvind Chavhan**

### Cite this article as:

Kale Sanjay S (2018) Bio-chemical analysis of *Cotugnia mohekarae* n. sp. from Columba Livia intermedia, *Int. J. of. Life Sciences*, Volume 6(2): 643-645.

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Available online on  
<http://www.ijlsci.in>  
ISSN: 2320-964X (Online)  
ISSN: 2320-7817 (Print)

## ABSTRACT

Gastrointestinal cestode parasites are the most pathogenic parasites present in animal, birds and fishes. Parasitic biochemical studies has great importance in understanding the complex association in host parasite relationship. Whereas, the evidence in parasitic biochemical studies is patchy. Gastrointestinal cestodes are the most pathogenic parasites in Columba livia intermedia are tropics and subtropics areas. Present study deals with the biochemical studies of *Cotugnia mohekarae* n.sp. present in Columba livia intermedia in respect with the protein, glycogen and lipids metabolism.

**Keywords:** Bio-chemistry, *Cotugnia mohekarae*, Columba livia intermedia

## INTRODUCTION

Protein, glycogen and lipids are the chief components for growth and development of parasite. It has been observed that the normal diet of vertebrates substantially has a part of protein glycogen and lipids in the intestine. Which provides a rich environment for the nourishment of cestodes. Protein are taken up by diffusion and transfusion. Carbohydrates is a major energy source utilised by parasite. Lipids acts as energy reserve in cestodes. Carbohydrates are utilised exogenously. It takes place by active transport.

Protein are very essential for parasite. If protein is removed from the diet of host, even then amino acids occurs in intestinal lumen. When rats are given protein free diet then also *Hymenolepis diminuta* by Phifer, 1960 and Fisher 1965 observed somewhat unfavourable to the adult worm. But Clark, 1968, indirect rather than direct influence was probably involve.

Experiments in protein metabolism in cestodes have been carried out in *D. latum*, *E.granulosus*, *T. solium*, *R. cesticilus* etc. Sufficient literature is present for parasitic worms in relation to distribution of carbohydrates. The quantitative values found in previous and many recent scientist work on it

Winland (1901 b); Vonbrand, 1934, Salisbury and, Andersson 1939, Dognerty and Taylor 1956, Goodchild and Vilar Alrarez, 1962, Schulte 1971 and others have been obtained by chemical methods.

The specimens which have been previously experimented by different workers for carbohydrate metabolism are *oochoristica*, *monniezia*, *expansa*, *T. saginata*, *H. nana* etc.

**Ginger** and Fairbrain, 1966 b worked lipid on experiment *H. diminuta*, Vyhrestyuk, Vorygina and Nikitenko, 1977 on *R. tetragona*, Nigam and Premvati 1980 on *C. dignosora* and *R. fuhrmann* etc. Present communication deals with the study of biochemical analysis of protein, glycogen and lipid.

## MATERIAL AND METHODS

The intestine of *Columba livia intermedia* dissected carefully in laboratory. Seven of them infected with cestode parasite. Small pieces of infected intestine also collected to find out the protein, glycogen and lipid content in them.

The identical worms dried on the blotting paper and wet weight of the tissue taken, then material was transferred in previously weighed watch glass and kept at 60° c for twenty four hours. Dry weight of material was taken and powder prepared.

The estimation of protein content in the cestode parasite were carried out by Gornell et al. (1949) method. Glycogen estimated by Kemp et.al (1954) method and lipid content was Barrer's and Black stock method (1973).

### Statistical analysis

Protein estimation in *Cotugnia mahekarae* n.s

The amount of protein in worm was calculated by the formula:

$$\frac{O D \text{ of unknown tissue}}{O D \text{ of known tissue}} * \text{mg of potein} * \frac{1000}{\text{wt of the tissue taken}}$$

O D of unknown tissue = 0.43

O D of known tissue = 0.58

**Table 1:**

	Protein (mg/gm)	Glycogen (mg/100ml solution)	Lipid (mg/100 mg)
<i>Cotugnia mahekarae</i> n.sp.	30.85	18.46	21.45
<i>Columba Livia intermeida</i>	35.11	21.57	20.92

Mg of protein = 10

Wt. of tissue taken =240.20

$$\frac{0.43*10}{0.58} * \frac{1000}{240.20} = 30.85 \text{ mg/gm wet weight of the tissue.}$$

The protein content of host intestine was estimated by same procedure. It was 35.11 mg/gm. wet weight of tissue.

Results when compared showed that the worm *Cotugnia mohekaren*.sp. observed 30.85mg/gm. of protein from environment which contained 35.11 mg/gm. of the wet weight of tissue.

### Glycogen estimation in *Cotugnia mahekarae* n.sp.

The amount of glycogen in worm thus calculated by the formula:

$$\text{Percentage of glycogen} = \frac{100 * u}{1.11 * s}$$

U= O D of unknown test solution

S= O D of known test solution

1.11= Conversion factor of glucose to glycogen

U= 0.41

S=2

$$\text{mg of glycogen} = \frac{100 * 0.41}{1.11 * 2} = 18.46 \text{ mg per 100 ml of solution}$$

The glycogen in host intestine calculates from same way 21.57 mg/100 ml of solution.

## RESULTS AND DISSCUSSION

### Lipid estimation in *Cotugnia mahekarae* n.sp.

The intestine dissected and were found to be infected with cestode parasite. Those parasite of various hosts were kept separately and intestine of various hosts also kept separately in previously weighed watch glass. This material was taken on blotting paper to remove excess of water and then it was weighed on sensitive balance to obtain the wet weight of tissue. The tissue kept at 80° C till dried completely. The tissue then powered in mortar and pestle and preserve for further studies. Lipid content was estimated by Barner's and Black Stock method (1973).

The lipid content was very high in worms as compared to their host. Lipid levels was 21.45mg/100 gm in *Cotugnia mahekaraen.sp.* Whereas, it was 20.92 in its host *C. livia intermedia*.

## CONCLUSION

Thus it is concluded that the worm could maintain good balance in protein, glycogen and lipids.

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