



# “PROTEIN CONTENTS IN CESTODE OF THE GENUS *POLYONCOBOTHRIUM* AND ITS HOST *MASTACEMBELUS ARMATUS*”

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## ABSTRACT

Present study deals with quantitative investigation of protein content in Cestode of the genus *Polyoncobothrium sp.* and its normal and infected intestinal host tissue of *Mastacembelus armatus*. Obtained result indicate that amount of protein present in *Polyoncobothrium sp.* is lower (2.37 mg/gm) as compared to protein present in infected intestinal tissue of *Mastacembelus armatus* (3.53 mg/gm) as well as in normal host intestinal tissue of *Mastacembelus armatus* (4.12 mg/gm).

**Key words-** Cestode, *Mastacembelus armatus*, Protein Content, *Polyoncobothrium 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. The elongated tape-like body of the cestode enables it to live in its tubular habitat (Smyth and McManus 2007). As an alimentary canal is absent, the worm derives its nutrition from the host's gut across its highly specialized, metabolically active body surface or tegument (Smyth and McManus 2007). Molecules with high molecular weights are the basic components of living cells and called macromolecules. They are proteins, carbohydrates, fats and nucleic acids. Biochemical molecules have different chemical structures and functions. They are energy-rich sources, synthetic components and carriers of genetic traits (Rao and Suryalakshmi, 2011). 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. 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. Parasites use this nourishment for their development and growth. Fish is correctly regarded as a healthy component of the diet. Fish is an excellent source of food. To obtain healthy and quality meat fish, it is necessary that the fish should be free from all types of infections. Helminths are found in almost all the animals including fish throughout the world.

## MATERIAL AND METHODS

For collection of Cestode parasites, the intestine of *Mastacembelus armatus* were collected from different localities of Nanded. Collected worms were washed; preserved in hot 4 % formalin; stained in Borax carmine; Stained specimens were dehydrated through ascending alcoholic grades i.e. 30%, 50%, 70%, 90% and 100%, cleared in xylene and mounted in DPX. Drawings are made with the aid of camera lucida for taxonomic identification. The Cestode parasites collected from intestine of fish host *Mastacembelus armatus* was identified as *Polyoncobothrium sp.* Protein content was determined by the Lowery's Method (1951).

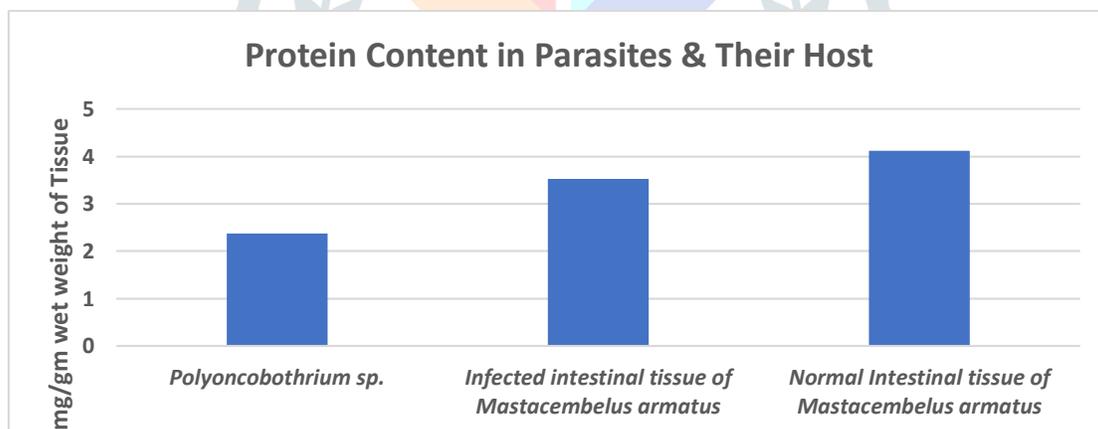
## RESULTS

Result obtained in present study indicates that amount of proteins present in *Polyoncobothrium sp.* is lower (2.37 mg/gm) as compared to protein present in infected intestinal tissue of *Mastacembelus armatus* (3.53 mg/gm) as well as in normal host intestinal tissue of *Mastacembelus armatus* (4.12 mg/gm). This is summarized in table and graph.

**Table: Comparative chart of protein content in *Polyoncobothrium sp.*, infected intestinal tissue and Normal intestinal tissue of *Mastacembelus armatus*.**

Protein contents (mg/gm wet weight of Tissue)		
<i>Polyoncobothrium sp.</i>	Infected intestinal tissue of <i>Mastacembelus armatus</i>	Normal Intestinal tissue of <i>Mastacembelus armatus</i>
2.37	3.53	4.12

**Graph: Graph showing protein content in *Polyoncobothrium sp.*, infected intestinal tissue and Normal intestinal tissue of *Mastacembelus armatus*.**



## DISCUSSION

Finding of present study are in agreement with previous study of Jadhav et.al., 2008 who reported amount of protein in *Davainea shindei* is 13.20 mg/mg wt. of tissue where as in host intestine is 15.42 mg/mg of tissue. Bhure et. al., 2012 recorded lower (15.88 mg/gm) amount protein in *Ascaridia galli* as compared to infected intestine (19.33 mg/gm) and normal host intestine (19.77 mg/gm). Nanware et.al., 2012 studied amount of proteins in *Cotugnia sp.* is lower (5.77mg/gm) as compared to protein present in infected intestine (6.66 mg/gm), in host normal intestine (16.22 mg/gm). Bhure et. al.,2013 reported low amount of protein in *Moniezia expansa*(2.72 mg/gm wet weight) as compared to infected intestine of *Capra hircus* (3.63 mg/gm wet weight) and normal intestinal tissue of *Capra hircus* (4.09 mg/gm wet weight). Pallewad et al., 2014 studied Protein contents in normal intestinal tissue of *Capra hircus L.* is 31.27 mg/100 mg; in infected intestinal tissue is 28.36 mg/100mg where as in *Cotylophoron sp.* is 23.60 mg/100gm. Bhure et.al.,2015 recorded proteins in *Spinitectus indica sp.* (2.55 mg/gm) is lower to infected intestinal tissue of *Mastacembelus armatus* (3.11 mg/gm) as well as

normal intestinal tissue (4.22 mg/gm). Bhure et.al.,2021 reported amount of protein present in *Stilesia* sp. is lower (2.98 mg/gm) as compared to protein present in infected intestinal tissue of *Ovis bharal* (4.12 mg/gm) as well as in normal host intestinal tissue of *Ovis bharal* (4.88 mg/gm). Also the concentration of proteins between different worms varies according to the type of host and the nature of the food, where protein ratio in the parasite depends on the host's protein-rich substances (Al-Kallak, 2001). Since fish are rich in protein, they account for about 15-24 % of body weight, so parasitic worms benefit from this characteristic and show a high level of protein compared with other types of worms that infect other vertebrates.

The present study indicates, protein is low in Parasite than infected and normal intestinal tissue.

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### REFERENCES

- Al-Kallak, S.N. H.(2001).** Morphological, histological and chemical studies on two cestode models as fish parasites. Ph. D. thesis, College of Science, University of Mosul, Iraq.
- Bhure D. B., Kadam Nima, Nanware S. S. and Garad V.B. (2012).** Studies on protein profile of *Ascaridia galli* and its host *Gallus gallus domesticus* *International Multidisciplinary Research Journal* **Vol.2 (6):**60-61
- Bhure Dhanraj Balbhim, Kalyankar Madhav Marothrao and Nanware Sanjay Shamrao (2013).** Studies on Protein contents of *Moniezia expansa* Rudolphi, 1810 and its host *Capra hircus*. *Indian Journal of Applied Research*. **Vol.4 (4):** pp 67-68.
- Bhure Dhanraj Balbhim, Nanware Sanjay Shamrao and Kardile Swati P. (2015).** Studies On Protein Content Of *Spinitectus indica* Bhure and Nanware,2013 and its Host *Mastacembelus armatus* Lacepede, 1800. *Proceeding of National Conference on "Current Trends in Aquaculture"*. Published as a Special Issue of *International Journal of Advanced Research in Basic and Applied Sciences*. Special Issue pp.108-111.
- Dhanraj Balbhim Bhure, Sanjay Shamrao Nanware\*, A.A.Page , Mayur Darbeswar, P.S. Manoorkar and D.D.Gour (2021).** Quantitative Analysis of Total Protein Contents in Cestode *Stilesia* sp. and its host *Ovis bharal*. *Journal of Emerging Technologies and Innovative Research*. Volume 8, Issue 12.pp.17-19.
- Jadhav, B. V., Shivesh P. Singh, Bhure, D. B. and Padwal, N. D. (2008).** Biosystematic studies of *Davainea shindei* n.sp. (Cestoda- Davainidae) Fuhrmann, 1907 from *Gallus gallus domesticus*. *National Academy of Science Letter* **Vol.-31 No.-7&8:** pp 245-250.
- Lowry, O.H., Rosenborough, N.J., Farr, A.L. and Randall, R.J., (1951).** Protein measurement with folin phenol reagent. *J. Biol. Chem.* **193:** 265-275.
- Nanware S. S., Nazneen Uzma, Bhure D. B. and Garad V.B. (2012).** Studies on protein content of cestode *Cotugnia* and its host *Gallus gallus domesticus* *Journal of Experimental Sciences* **Vol. 3(1):** 40-41.
- Pallewad Sushma, Nanware Sanjay Shamrao and Bhure Dhanraj Balbhim (2014).** Biochemical contents of *Cotylophoron cotylophorum* (Fischoeder, 1901) Stiles et Goldberger, 1910 and its host intestinal tissue. *Biolife, An International Journal of Biology and Life Sciences*. **Vol. 3(1)** pp.192-195
- P.Anil Kumar (2014).** Biochemical effects on Protein and Free Amino acid metabolism in *Catla catla* and *Labeo rohita* due to *Pallisentis nagpurensis* infection. *American International Journal of Research in Formal, Applied & Natural Sciences*, **6(1):** pp. 82-85
- Rao, R. and Suryalakshmi, A. A. (2011).** Textbook of Biochemistry 11th ed., UBS publishers distributors Pvt. Ltd., New Delhi, 2011; 586.
- Smyth J.D. and McManus D.P.(2007).** *The physiology and biochemistry of Cestodes*. Oxford: Cambridge University Press; 2007.
- Yamaguti, S.(1959).** *Systema Helminthum. II.The Cestodes of Vertebrates*. Intescience Publishers Inc. N.Y., pp 860.