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ORIGINAL ARTICLE

Studies on Protein and Lipid Contents in Piscean Pseudophyllidean *Cestode senga* Sp. Parasitic in *Mastascembelus armatus*

Sanjay Shamrao Nanware, Sumayya Nibraz and Dhanraj Balbhim Bhure
Department of Zoology, Yeshwant Mahavidyalaya, NANDED 431 602 (M. S.)
Email: drajbhure82@gmail.com, snanware@rediffmail.com

ABSTRACT

Most of the parasites reside in association of fishes of economic importance. Parasitic biochemistry has great practical importance through chemotherapy and vaccine production and in understanding of the complex association involved in the host parasite relationship however ; information in parasite biochemistry in patchy. It is a field growing in parallel with the new surge of interest in tropical diseases. whereas previously parasitologists have been require to adopt biochemical methodology in order to stay abreast of development. Intestinal cestode are the most pathogenic parasites in fresh water fish Mastacembelus armatus. Parasitism is a natural way of life, among the large number of organism and parasitic diseases are the major public health problem, which result into morbidity and mortality in tropical countries, particularly in the socio economically under develop societies in the world. Result obtained an amount of protein *and Lipid* in *Cestode Senga in* the present study *is Total protein (0.39gm), Albumin (0.20gm)and Globulin (0.19gm). While Cholesterol (49%), triglycerides(15.5%), H.D.L. cholesterol (75%), V.L.D.L(3.01%), L.D.L(29.1), Chol./HDL ratio(0.65%) and LDL/HDL ratio (0.38%). The present study indicates that the parasites were capable of extracting nutritious material from their hosts and thus represented a higher level in protein and lipids contents in their body.*

Key words: *Mastacembelus armatus, Protein and Lipid contents, Pseudophyllidean Cestode Senga sp.*

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INTRODUCTION

Proteins are complex molecule composed of amino acids and necessary for the chemical processes that occur in organisms. Proteins are basic constituent in all living organisms. Their central role in biological structure and functioning was recognized by chemist in the early 19th century when they coined the name for these substances from the Greek word "proteios", meaning "holding first place". Protein constitute about 80% of the dry weight of muscle, 70% of that of skin ,and 90%of that of blood. The interior substance of plant cell is also composed partly of protein. The importance of protein is related more to their function than to their amount in organism or tissue. All known enzymes, for example, are proteins and may occur in very minute amounts; nevertheless, these substances catalyze all metabolic reaction enabling organism to build up the chemical substances –other protein, and lipids –that are necessary for life. The proteins are absorbed by the parasites by diffusion and transfusion. Tapeworm completely lack alimentation in all stages of life history. The predigested food in host's small intestine (especially intestine is the chief source of nourishment for tape worm soluble nutrient like glucose, amino glycogen and of some lipid substances. The essential and non essential amino acid are required protein are also digested at the host parasite interface by activity of photolytic enzyme and these

secreted by the cestode tegument. Amino acid are absorbed by active transport but some amino acid try inhibit the uptake of other where as some have no effect. In hymenolepis diminuta there was interface by amino acid if the diet contained an incomplete protein or there was imbalance in dietary amino acid (e.g. Casein or Zein). It may be possible or change in the molar rations of intestinal amino acid. This can have influence on the response of the parasite to an altered host diet. The cestod parasites utilized the food from the gastrointestinal tract of the host so their metabolism depends on the nourishment available in the gut of the host. The metabolic and in vitro studies suggest that cestodes need proteins from the predigested food from the host intestine for various metabolic activites. Ammonia and urea are obtained from intra cellular compound, so they are the true end products .the cestodes are used to live freely in watery medium and they remove the end products so they are knoen as ammniotelic organisms.

Lipids are naturally occurring molecules that include fat, waxes, sterols, fat-soluble and vitamins(such vitamin A,D, E and K), monoglycerides, diglycerides, phospholipid and other. Lipid may be broadly defined as hydrophobic or amphiphilic small molecules; the amphiphilic nature of some lipids allow them to form structure such as vesicles, multilamellar /unilamelar liposome, or membrane in an aqueous environment. Although the lipid is sometime used as a synonym for fats, fats are sub group of lipids called triglycerides. Some essential lipid can not be made this way and must be obtained from the diet. Lipid are not soluble in water, they are non-polar and are thus soluble in nonpolar environment like choloroform, lipid are oxidized to released large amount of energy and are useful to living organisms. Lipids can make up anywhere from 20 to 80 percent of the membrane ,with the being proteins. Oils are triglycerides that appear as a liquid at room temperature, oil are mainly present in plant and sometime in fish. In patients infected with some other helminthes alterations in the lipid profile have been observed. Also the mechanisms involved in lipid changes especially in membrane proteins related to parasite infection remain uncertain. Present review of litreture shows that parasite induce significant changes in lipid parameters, as has been shown in vitro study of serum by lipid/cholestrol n medium and experimental models. Thus changes in lipid profile occur in patient having active infections with most of the parasites , membrane proteins are probably involved in such reaction. The parasite to break up the consumed lipid /cholesterol. Lipids also forms the basis of steroid hormones. Level of lipoprotein like high density lipoprotein (HDL), low density lipoprotein (LDL) and total cholesterol in patients suffering from parasitic infection. These parasites have developed unique metabolic pathways that allow them to survive and multiply by scavenging nutrients from the host. These parasite can take up the lipid and cholesterol they need from lipoprotein particles present in the host gut and tissue in vivo and from growth medium in vitro. Present study is focused to obtain an amount of proteinand Lipid in Cestode *Senga* parasitic in *Mastacembelus armatus.*

MATERIALS AND METHODS

Piscean cestode were collected from intestine of *Mastacembelus armatus* from local fish market Nanded, M.S. India. Generally mature worms of same size & length were selected for biochemical profile i.e. lipid and protein profile. Lipid profile test was estimated by GPO-PAP , triglycerides method and cholesterol by CHOD-PAP method. And protein was estimated by Biuret method. Both test are prepare by using biochemical analyzer ERBA CHEM 5v3 photometer for clinical chemistry.

RESULTS

The result obtained an amount of protein and Lipid in the present study summarized in table 1&2 and Graph 1&2.

Result obtained an amount of protein and Lipid in Cestode *Senga* in the present study is Total protein (0.39gm), Albumin (0.20gm)and Globulin (0.19gm). While Cholesterol (49%),

triglycerides (15.5%), H.D.L. cholesterol (75%), V.L.D.L(3.01%), L.D.L(29.1), Chol./HDL ratio(0.65%) and LDL/HDL ratio (0.38%).

Table 1: Biochemical estimation of protein from *Senga* parasite by using Biochemical Analyzer

Name of parameter	Contents in *Cestode Parasite Senga*
Total protein	0.39gm
Albumin	0.20gm
Globulin	0.19gm

Graph1: Graph showing percentage of Protein parameters in *Senga* parasite by using Biochemical Analyzer

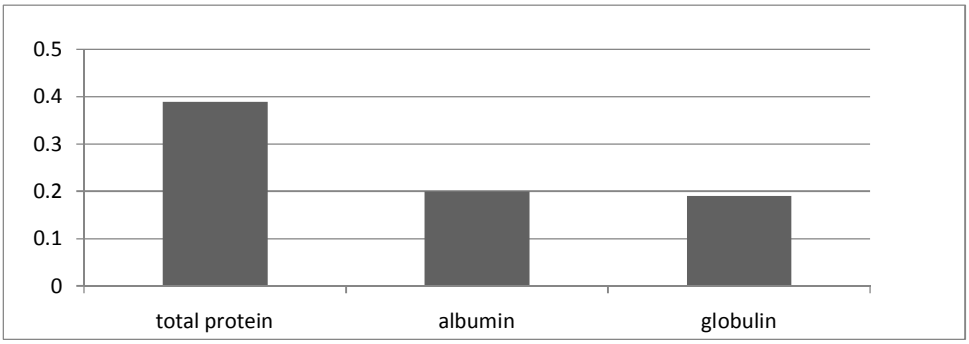
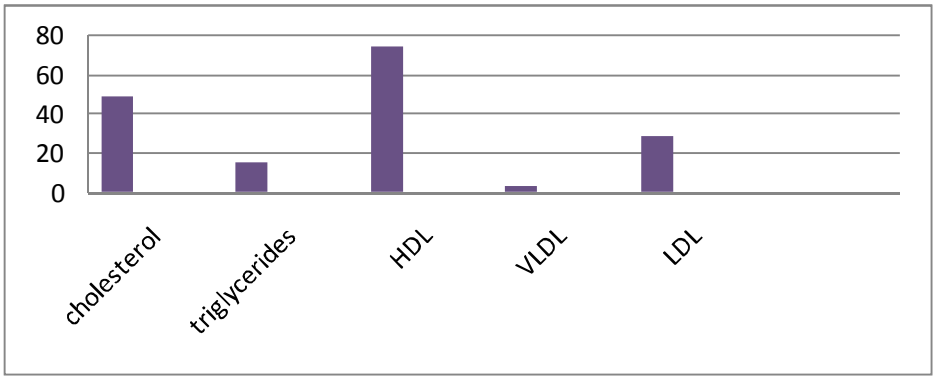


Table 2: Biochemical estimation of Lipid from *Senga* parasite by using biochemical analyzer

Name of parameters	Contents in Cestode Parasite Senga.
cholesterol	49%
triglycerides	15.5%
H.D.L. cholesterol	75%
V.L.D.L	3.01%
L.D.L	29.1
Chol./HDL ratio	0.65%
LDL/HDL ratio	0.38%

Graph 2: Graph showing percentage of Lipid parameters in *Senga* parasite by using biochemical analyzer



DISCUSSION

Jadhav *et. al.* 2007 reported biochemical contents from *Davainea shindei.* amount of protein present in *Davainea shindei* 13.20 mg/gm wt. of tissue. Bhure et. al., 2012 studied amount of proteins present in nematode parasites is (15.88 mg/gm). Nanware *et.al.,* 2012 studied amount of proteins present in Cestode *Cotugnia* sp. is 5.77mg/gm. Dhondge *et. al.,* (2010) and Laxma Reddy B. and Benarjee G. (2014) reported amount of Protein was lower in the body of parasites than infected and normal intestinal tissue of host. The distribution of protein content shown in present study is an agreement with the previous study.

In parasitic helminthes, the protein usually constitute between 20-40 % of the dry weight (Sharma 1979) but values, as high as 70 % of the dry weight have been reported for *Macrachanthorhynchus hirudinaceus* and the infective larvea of Nippostrongylus brasiliensis (Barrett 1997) the female parasites showed higher level of amino acid then the males (Barus 1998) the total protein content of Acanthocephalon parasites *Pallisentis nagpurensis* shows the femal parasites were having higher protein content then males. They also determine soluble, insoluble protein and free amino acids in adult *Pallisentis nagpurensis* that is soluble protein in female body 40.1 ± 4.2 where as in male is 20.2 ± 3.0, in soluble protein is 54.2 ± 4.2 in female 30.2 ± 3.0 in male and free amino acid is 4.05 ± 0.05 in female where as 3.10 ± 0.42 in male body.

The difference in lipid content of the parasite due to the difference in diet. Hence there is a relationship between the lipid content of parasite and nutrient content in environment. Similar finding was recorded by Dhondge *et.al.,* 2010 reported amount of Lipid was lower in the body of parasites than infected and normal intestinal tissue of host. Bhure et. al., 2011 reported Lipids contents in tapeworm *Tylocephalum sp.* is 16.74 mg / 100 mg. Jadhav et.al 2008 determine lipid content in *D. shindei* is 17.85 mg/gm. Nanware et al., 2011 described regional distribution of lipid in *Stilesia* sp. Higher content of lipid in older proglottids has led to the view that much of this lipid largely represents waste products of metabolism (Brand T. Von, 1952). M.R. Siva Sai Kumari (1994) reported total lipids content of cestode *Ncokrimia singhia* in immature mature and gravid region was 4.675 $\pm$ 1.215, 29.200 $\pm$ 0.608 and 31.902 $\pm$ 2.804 mg/gm fresh weight.

CONCLUSION

The present study indicates that the parasites were capable of extracting nutritious material from their hosts and thus represented a higher level in protein and lipids contents in their body.

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