RESEARCH PAPER | Zoology | Volume : 4 | Issue : 5 | May 2014 | ISSN - 2249-555X

Glycogen Content in Moniezia Expansa and its Host Intestine

KEYWORDS: Capra hircus, Glycogen Content, Mammalian Tapeworm, Moniezia expansa.

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ABSTRACT *The present study deals with the content of glycogen in mammalian tapeworm Moniezia expansa and its host tissue i.e. infected and normal intestinal tissue. The present result indicates that the glycogen content is lower in the body of parasites (13.06 mg/gm wet weight of tissue) than infected intestinal tissue (15.76 mg/gm wet weight of tissue) and normal intestinal tissue of the host (23.42 mg/gm wet weight of tissue).*

Introduction

Carbohydrates are very important component due to it is a chief energy source in animal body. 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. Glucose is very important energy source for many helminthes in habiting the gut of vertebrates. Similarly, glycogen in most of the tapeworms provides a significant reserve store of energy.

The quantative values determined by many workers viz. Woodland (1923) Read et.al., (1956,1958,1967), Von Brand (1950,1960, 1966)and others have been obtained by rather unspecific chemical method, there often given higher values than those obtained by means of an enzymatic procedure (Glucose oxidize); Daughtry J.W. and Taylor D.(1956) studied regional distribution of glycogen in cestode of rat, Goodchild D.G. (1961) studied carbohydrate content of cestode H.diminuta from rat, Cheng T.C. and Dyckman E (1964) described glycogen deposition in H. diminuta, Chopra A.K.(1981) studied glycogen contents and its distribution in cyclophyllidean cestode of sheep, Singh et al., (1987) described total carbohydrates and glycogen in Cestodes, Hiware and Jadhav (1994) studied quantitative studies of glycogen in some cestodes, Pappas P.W., Barly A.J. and Werdropsm (1999) studied glucose and glycogen gradient in H. diminuta and Ramalingam, K. Vijayalakshmi, V. and Satyaprema, V.A. (2004) studied Carbohydrate profile in relation to growth and differentiaationn of proglottids in Avitellina lahorea

MATERIAL AND METHODS

Some intestine of Capra hircus were brought and these intestines were dissected for the collection of parasites. The identical parasites are sorted, few of them fixed in 4% formalin for identification. The taxonomc observation turns then to Moniezia expansa.

Small pieces of infected, non-infected intestine and Cestode parasite Moniezia expansa were collected and washed thoroughly in distilled water and the Glycogen content was determined by the method of Kemp et.al.1954.

RESULTS

The amounts of Glycogen in the worms were calculated by the Formula:

$$\text{Percentage of Glycogen} = \frac{100 \times U}{1.11 \times S}$$

Where,

U = Optical Density of Unknown solution.
S = O.D. of the 100 mg of Glucose standard= 2
1.11 = Conversion factor of glucose to Glycogen.

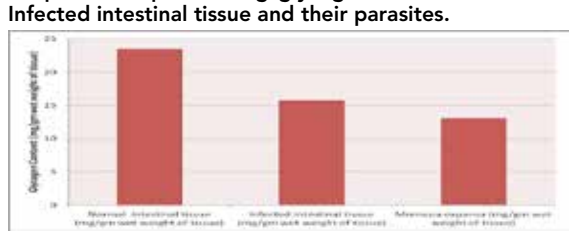
Table 1:- Comparative chart of glycogen contents in Normal, Infected intestinal tissue and their parasites

Sr.No.	Name of parasites	Normal Intestinal tissue (mg/gm wet weight of tissue)	Infected intestinal tissue (mg/gm wet weight of tissue)	Parasites (mg/gm wet weight of tissue)
1	Moniezia expansa	23.42	15.76	13.06

DISCUSSION

The result obtained in the present study indicates that the glycogen content shows differential values in parasite, normal and infected intestine as the cestode parasites contain low glycogen as compared to its host intestine. These were true for all the worms and are summarized in table no.1.

Graph 1:- Graph showing glycogen contents in Normal, Infected intestinal tissue and their parasites.



Graff and Allen (1963) determined glycogen content of Moniliformiis dubis from male rat. The glycogen content of the male worms, when expressed as mg glycogen/gm wet weight of tissue, was over twice them the amount found worms i.e.16.81 (14.3) in male while 7.87 (11.76) in female. Theron O, Odlang (1955) determined the amount of glycogen in trematode and cestode i.e. lung flukes Haematoloechus complexus and H. medioplexus have significantly smaller amount of glycogen than frog tapeworm, Crepidobothrium saphena. C.A. Hopkins (1950) described artificial infection of Schistocephalus to pigeon from fish body. He observed that the amount of glycogen in parasites body i.e. 11.9% (after infection of 24 hours) 10.8% (after 48 hours) and 10.0% (after 72 hours). Axmonn (1947) explained size of the parasite was on factor and that large flukes such as Fasciola, Fascioloides and Alassostoma stored greater quantites of glycogen then smaller worms, Habitat also very important factors which play

Volume : 4 | Issue : 5 | May 2014 | ISSN - 2249-555X

important role in amount of glycogen present in parasites body. Jadhav et.al, (2008) reported similar result related with glycogen content i.e. in Davainea shindei is lower (15.17 mg/100ml) than in host intestine (17.56 mg/100 ml). P. Anilkumar and Rajlingam (2009) determined the glycogn level in normal and post helminth infected tissue a Catla catla and Labeo rohita. They summarized the content of glycogen is high in infected intestine and liver of Catla catla and Labeo rohita as compared to normal tissue of both fishes. But in the present investigation, there is marked variation in glycogen content as lower glycogen level is noticed in parasite than infected and normal intestine of its host. Similar finding were reported by Bhure et.al.,2014 from Mastacembelus armatus and its parasite Senga sp. His result shows glycogen content in the normal intestinal tissue is 26.58mg/100 mg and in infected intestine contents 24.32mg / 100 mg where as in S. satarensis is 21.62mg / 100 mg, S. madhavae is 19.37 mg / 100 mg, S. mangalbai is 21.17 mg / 100 mg and S.microrostellata is 20.27 mg / 100 mg.

CONCLUSION

The present study indicates that the amount of glycogen is lower in the body of parasites than infected and normal intestinal tissue of host. As well as the amount of glycogen present in all cestode parasites are some variable due to its size and its habitat. The Cestode parasite Moniezia expansa quite successful in obtaining a sufficient amount of glycogen from the environment.

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