

15. Glycogen Content of Some Fish Parasites, Proteocephalus Sangameshwariensis N.Sp with Mastacembellus Armatus and, Tetragonocephalum Aurangabadensis N.Sp with Trygon Shphen from West Coast of India

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Abstract

Glycogen is a most abundant organic molecule in cell it may be more than 50% of body weight. They are present each and every part of the body. The glycogen is absorbed by endoparasites of fishes, it causes ill effect on host body. The present paper deals with how cestode parasites maintain the good balance in glycogen content and also maintaining histopathological relation between *Proteocephalus sangameshwariensis* n.sp with *Mastacembellus armatus* and *Tetragonocephalum aurangabadensis* n.sp with *Trygon shphen*.

Key words :- Cestode, Host, Glycogen, Colorimeter, Biochemical.

Introduction

Cestodes when live in the intestine of hosts, they utilize food from the gastrointestinal tract. The metabolism of these cestodes depend on the feeding habits and the rich nourishment available in the gut of the host. These worms use this nourishment for their normal development and growth. The metabolic and in vitro studies suggest that a complex nutritional relationship occurs between a cestode and its host. It has been observed in some cestodes that they are capable of fixing CO_2 . Thus, it is clear that the parasites use the waste metabolic materials from the host's intestinal mucosa very efficiently, whereas there are another to be capable of taking the nutritional material by direct contact with the mucosal wall. Glycogen content is variable in different strobilla ex. *H. diminuta* (Good Child 1961) percentage of glycogen changes as age of

worm (Mettre and Cannon 1970). In posterior segments lipid is more than anterior segments. There is a variation in the lipid content of one species to other species.

The glycogen content of various helminths fluctuates considerably and there is variation in habitat, though no similarity in nutrition of worm is important. This reveals the glucose concentration in the tissues of *Taenia taeniaeformis*, which rises by as much as 100-200 mg/100 on incubating in vitro in glucose containing medium. (Von Brand et al 1964) but it increases when the worms incubated in sodium for saline, which do not permit glucose absorption. In this instance enlarged tissue glucose has been presumably derived from glycogen breakdown (Von Brand and Gibbs 1966). In case of *Hymenolepis diminuta* glucose is not evenly distributed along the strobila. (Goodchild, 1961) but whether the nutritional factors play a role in it is not known.

The cestodes which have been already experimented by different workers for the Glycogen metabolism are *Taenia crossiceps*, *T. pisiformis*, *T. saginata*, *Moniezia expansa*, *Moniezia benedeni*, *Echinococcus granulosa*, *Diphylidium caninum*, *Bothriocephalus gowkongensis*, *Phyllobothrium*, *Hymenolepis diminuta*, *H. citelli*, *H. nana* and the genus *Oochoristica*, *Raillietina* etc.

Material and Methods

Glycogen estimation in cestode parasites was carried by Kemp et al. (1954) method. Twenty intestines of *Mastacembalus armatus* (Linnaeus, 1758) and *Trygon sephen* were brought to laboratory during January 2018 to December 2018 from District Ratnagiri M.S (West coast of India) and were dissected for collection of cestodes. Out of twenty intestines four intestines were found to be heavily infected with cestode parasites. By observing the identical worms under the microscope, few of them were fixed in 4% formalin for Morphological studies. Taxonomical observations turned to the n.sp. of the genus *Mastacembellus armatus* and *Trygon shphen*

Small pieces of infected intestine were also collected for estimation of glycogen. The estimation of glycogen content in cestode and their host was done by Kemp et.al(1994) method. The collected worms were kept on blotting paper to remove excess of water from the body of cestodes. This material was transferred on a watch glass and weighed on a sensitive balance for 30mgs. This weighed material was ground into a homogenous paste in a mortar pestle, to this paste, 1ml of 30% KOH is added and taken in centrifuge tube and digested in hot water bath for 20 minutes, cooled and to the same 1.5ml of 95% ethanol was added by stirring

with a glass rod. Brought gently to boil in hot water bath, cooled and centrifuged for 15 minutes at 2000 R.P.M. Supernatant was drained on filter and 5ml of distilled water was added and reacted with 5ml of test solution, 5ml of glucose standard solution, 5ml distilled water, separately in three tubes, in each 10ml of Anthrone reagent was added and mixed, then heated for 10 minutes and immediately cooled and reading were taken with the help of Colorimeter at 620nm by setting blank 100. The amount of glycogen in the aliquot is calculated by the formula

$$100 \times 0.42 (U)$$

$$\text{Percentage of glycogen} = \frac{\text{-----}}{1.11 \times 2(S)} = 18.91 \text{ mg/100ml of solution}$$

U= O.D. of the unknown test solution.

S= O.D. of the 100mg of glucose standard.

1.11= conversion factor of glucose to

$$U=0.53 \quad S=2.$$

The Cestode parasite, *Proteocephalus sangameshwariensis* n.sp acquired 18.91 mg/100ml of solution of Glycogen. By using same techniques the glycogen content of host intestines were calculated. The infected intestines of the host (*Mastacembellus armatus*) have 30.04mg glycogen/100ml of solution.

By similar method the glycogen contents of worm, *Tetragonocephalum arangabadensis* WEDL, 1855 and Host *Trygon shphen*, is calculated, It shows 26.08 mg of glycogen /100 ml of solution in host body whereas its parasite *Phyllobothrium gracile* has acquired 20.02 mg/100ml solution of Glycogen.

Result and Discussion

The result obtained an amount of glycogen content in the present study indicates that the amount of glycogen present in cestode parasites is lower as compared to glycogen present in infected intestine as well as in host normal and infected intestine

Images- Hosts and their parasites

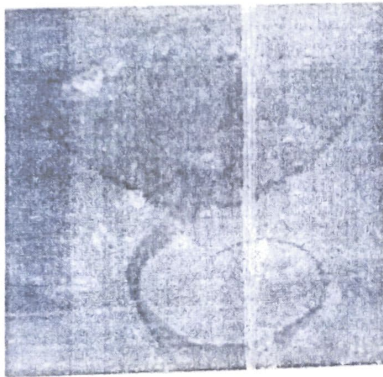
Parasite - *Proteocephalus sangameshwariensis* n.sp

Host - *Mastacembellus armatus*



Host- *Trygon sephen*

Parasite- *Tetragonocephalum aurangabadensis*



The result obtained in amount of glycogen content in the present study indicates that the amount of glycogen present in cestode parasites is lower as compared to glycogen present in infected intestine as well as in host normal and infected intestine. This is summarised in table

Table No. 1

Glycogen content of cestode parasites *Proteocephalus sangameshwariensis* n.sp, *Tetragonocephalum aurangabadensis*, with their hosts such as *Mastacembellus armatus*, *Trygon sephen* respectively

Sr.No	Name of Cestode parasites	% of glycogen in parasite	% of Glycogen in Host body	Name of Host
1	<i>Proteocephalus sangameshwariensis</i>	18.91	30.04	<i>Mastacembellus armatus</i>
2	<i>Tetragonocephalum aurangabadensis</i>	20.02	28.08	<i>Trygon sephen</i>

From the above result it can be concluded that the worm *Proteocephalus sangameshwariensis* n.sp. could maintain a good balance in glycogen content and also maintaining histopathological relation with the host *Mastacembellus armatus*. *Tetragonocephalum aurangabadensis*, could also maintain a good balance in glycogen contents and also maintaining Histopathological relation with the *Trygon sephen*.

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