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Quantitative estimation of glycogen phosphorylase in *Neokrimia singhia* (cestode) parasitic in *Perdicula asiatica*

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Abstract
Glycogen phosphorylase presence indicated that the parasite utilized glucose through glycolsis for energy turn over in preference to glycogen. Glycogen was important substrate in the initial phase of HMP pathway. The glucose residues in glycogen were mobilized by the enzyme glycogen phosphorylase. The amount of 'a' and 'ab' glycogen phosphorylase was estimated biochemically in Neo krimia singhia. The phosphorylase content of mature proglottid was higher followed by gravid and immature. A similar gradient as that of glycogen was found along the strobila.

Keywords: glycogen phosphorylase, *Neokrimia singhia, Perdicula asiatica*

Introduction
Glycogen phosphorylase plays an important role in the glycogen metabolism. The glycogen metabolism is regulated by the inter conversion of the phosphorylase 'a' and phosphorylase 'ab' (Proser, 1973) [5]. Glycogen phosphorylase occupies an important position in the glycolytic sequence as it is the initial catalytic enzyme in the chain of the chemical events that leads to phosphorylative degradation and utilization of glycogen.
The D-glucose units of the outer branches of glycogen is the entry into the glycolytic pathway through the sequential action of two enzymes: glycogen phosphorylase and phosphoglucomutase. Glycogen phosphorylase is widely distributed in animal cells. The glucose residues in glycogen, are mobilized by the enzyme glycogen phosphorylase which exists in both active phosphorylated form (Phosphorylase a) and less active phosphorylated form (Phosphorylase, b) Roberts *et. Al.*, (1972) [8].
Glycogen is broken down to glucose-I-phosphate which in turn is converted to glucose -6-phosphate in the presence of phosphoglucomutase.
Despite the fact that Glycogen is the main energy reserve in cestodes, relatively little is known of its properties, although its activity is simulated by Adenosine Mono Phosphate (AMP) in adult Hymenolepis diminuta. In addition cysticerioids of Hymenolepis diminuta have 'a' and 'b' forms of phosphorylase and their inter conversions similar to the situation in mammals. It is regulated by a 3', 5'- Cyclic AMP dependent protein Kinase and 'a' Phosphorylase phosphate (Moczon, 1975, 1977) [3-4].
In the present investigation an attempt was made to study the Glycogen phosphorylase activity in *Neokrimia singhia*.

Materials and Methods
Neokrimia singhia a common parasite of jungle bush quail was selected for the present investigation, since the biochemical aspects of the parasite has not been studied earlier.
These birds were collected from Ranga Reddy district and were sacrified in the laboratory. The intestines were then cut open and the parasites were flushed into saline water and repeatedly washed in ice-cold saline water to remove the adhering mucus and food particles. Generally, mature and live worms of same size and length were taken for biochemical studies.
The parasites were then transferred to Whatman's Filter No.1 to remove the adhering moisture. Then the parasites were weighed and used for the experiment.

Glycogen phosphorylase activity was assayed by Cori. *et. al*., (1943) [1] method

Results

The regional distribution of glycogen phosphorylase activity in *Neokrimia singhia* are given in Fig. No. 1. The values of phosphorylase 'a' activity in immature, mature and gravid regions was 0.365 ± 0.001; 0.571 ± 0.001 and 0.425 ± 0.001 mg/100 mg weight of the tissue/hour.

The values of phosphorylase 'ab' activity in immature, matureand gravid regions was 0.484 ± 0.001; 0.753 ± 0.001 and 0.594 ± 0.001 mg/100 mg wet weight of the tissue/hour.

The values of phosphorylase 'ab' activity was higher than the values of phosphorylase 'a' activity.

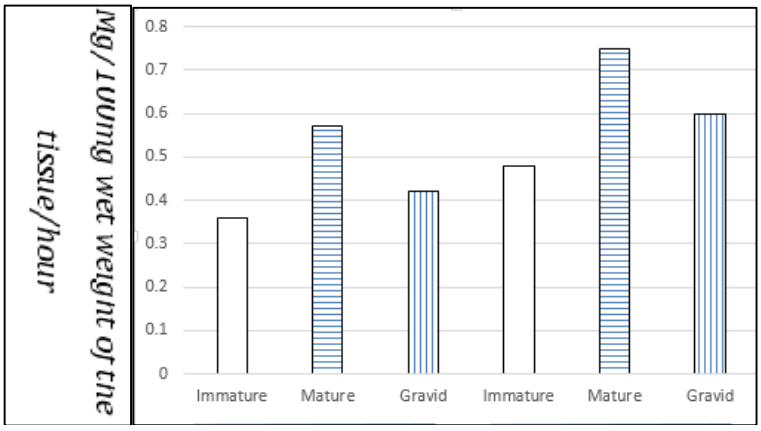

Fig: 1

Discussion

The presence of Glycogen phosphorylase activity in *Neokrimia singhia* indicated that the parasite utilizes glucose through glycolysis for energy turnover in preference to glycogen.

The glucose residues in glycogen were mobilized by the enzyme glycogen phosphorylase.

The values of Glycogen phosphorylase 'a' and 'ab' activity in the mature region of *Neokrimia singhia* was higher followed by gravid and immature regions. The regional distribution of phosphorylase'a' and 'ab' activity followed the similar pattern like that found in glycogen distribution. The variation along the strobila in the enzyme 'a' and 'ab' phosphorylase activity may be due to differential environmental influence on the different regions of the parasite and regional difference in permeability and different rates of metabolism along the strobila. Similar observation was reported in qualitative studies in H. diminuta by Moczon (1975, 71) [3]. In Choanotaenia acridothersi by Sailaja (1991) [7] and in Raillietina ® Paucites-ticulata by Sridevi (1991) [9].

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Glycogen phosphorylase 'a' ACTIVITY IN *Neokrimia singhia*

S.no.	Immature	Mature	Gravid
1.	0.370	0.574	0.429
2.	0.369	0.570	0.425
3.	0.366	0.572	0.427
4.	0.368	0.571	0.422
5.	0.362	0.570	0.426
6.	0.360	0.569	0.424
Mean	0.365	0.571	0.425
S.E. ±	0.001	0.001	0.001

Value s are expressed as mg/100 mg wet weight of the tissue/ hour.

Glycogen phosphorylase 'ab' ACTIVITY IN *Neokrimia singhia*

S.no.	Immature	Mature	Gravid
1.	0.488	0.575	0.599
2.	0.480	0.755	0.590
3.	0.486	0.752	0.592
4.	0.487	0.751	0.593
5.	0.485	0.753	0.596
6.	0.482	0.754	0.595
Mean	0.484	0.753	0.594
S.E. ±	0.001	0.001	0.001

Value s are expressed as mg/100 mg wet weight of the tissue.

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