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A Study on the Transaminase Activity of *Raillietina Tetragona* (Molin, 1858) Infecting Domestic Chick (*Gallus Domesticus*)

Achaiah N*

Department of Zoology, Kakatiya University, Warangal-506 009. (A.P), India

E-mail: achaiahsai@gmail.com

ABSTRACT

Raillietina tetragona is an endogenous helminth parasite infecting domestic chick. Transaminase enzyme (ALAT and AAT) levels in different regions representing different metabolic states were evaluated and the activity levels were statistically evaluated. A marked gradient of activity levels was observed. The results are discussed in relation to their metabolic activities.

Key words : *Raillietina tetragona*, domestic chick, Transaminases, ALAT and AAT, metabolic activities.

INTRODUCTION

Cestodes are a group of endoparasites which inhabit the intestines of the host. Much attention has been paid to carbohydrate metabolism as they are the chief energy source in cestodes. Enzymes are catalysts of biological systems. Transamination is the main mechanism for protein synthesis in helminthes (Von Brand, 1973). Transamination provides a link between carbohydrate and protein metabolism by interconverting keto acids and amino acids *vice versa*. Daugherty (1952) found the importance of carbohydrate intermediates of the Krebs cycle in protein metabolism of cestodes. These compounds, formed from glucose, apparently provide the tapeworm with the necessary building blocks for the production of amino acids and fats. Cheng (1964) stated the interrelationship between carbohydrate and protein metabolism is probably very close in certain helminthes. Yoon (1964) indicated that the transaminase plays an important role in protein synthesis in helminth parasites.

Daugherty (1952) reported high transaminse activity from *Fasciola hepatica*. Aldrich, Chandler and Daugherty (1954) studied its activity in *Hymenolepis diminuta*. Zeldon and Read (1960) evaluated the transaminse activity from three species of *Hymenolepis*. Cestodes synthesise proteins rapidly (Barrett, 1981) for egg production and tegument formation (Harris, 1983). Pathak *et al* (1981) reported serum ALAT and AAT levels of goats infected with *Cystecircus tennuicullis*. Min and Seo (1963) reported their activity from some helminthes. Nazifi *et al* (2011) and Radfar *et al* (2012) reported ALAT and AST activity levels from *Cystecircus tennuicullis*.

Although transaminases were identified in animal tissues as early as 1937, very few observations have been made on these systems in parasitic helminths. In the present study, a comparative analysis of transaminses was conducted in different regions of *Raillietina tetragona.*

MATERIAL AND METHODS

Parasites were obtained from the naturally infected domestic chick, collected from different

parts of Warangal. Collected worms were washed in saline and kept on blotting paper to remove water. Worms of same length were selected and biochemically analysed for ALAT and AAT levels. The results were analysed statistically by ANOVA.

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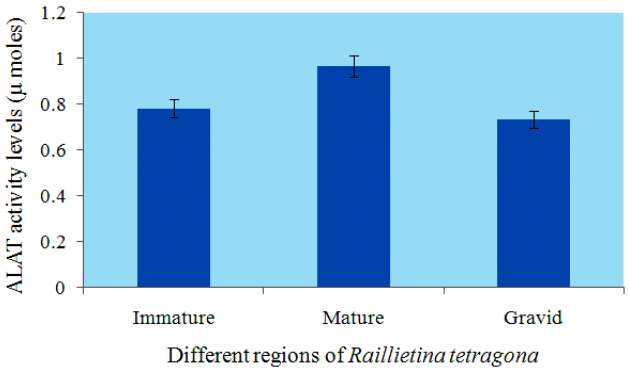
RESULTS AND DISCUSSION

Transaminase activity levels were determined by Reitman and Frankel (1957) as modified by Bergmeyer (1965).

The results of ALAT activity levels are presented in Figure-1. ALAT activity levels in immature, mature and gravid regions are 0.216 ± 0.080, 0.333 ± 0.087 and 0.95 ± 0.253µ moles of sodium pyruvate /mg protein /hr.

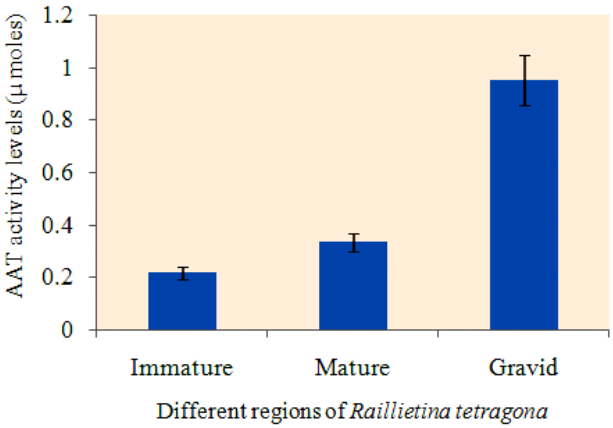
Figure-1. Histogram showing regional distribution of ALAT activity in *R.tetragona* (Values are expressed in µM of sodium pyruvate/mg protein/hour)



The results of AAT activity levels are presented in Figure-2. AAT activities are 0.783±0.076, 0.966± 0.111and 0.733±0.102 µ moles of sodium pyruvate/mg protein/irrespectively in immature, mature and gravid regions.

The present study revealed higher levels of ALAT in mature region and AAT levels in gravid region. The low activity of transaminases in *Raillitina tetragona* is in concurrence with earlier findings of Aldrich *et al* (1954) from *Hymenolepis diminuta,* Wertheim *et al* (1960) from *Hymenolepis diminuta*, *Hymenolepis citelli* and *Hymenolpeis nana*. When compared to vertebrates and insects, tapeworms have a limited capacity for transamination (Aldrich, 1954). It is in contrast to the higher levels of transaminases in trematodes (Von Brand, 1973). The low transaminase activity may be due to nutrient rich environment of the host.

Figure-2. Histogram showing regional distribution of AAT activity in *R.tetragona* (Values are expressed in µM of sodium pyruvate/mg protein/hour)



The reasons for low activity may be dietary effects, age of worms and reproductive phases of worm, which could also be attributed for variation in activity among three different regions. Werethiem *et al* (1960) declared that very few compounds serve as effective amino donors in Hymenolepis. In comparision with vertebrates (Awapara *et al* 1952), insects (Kilby and Neville, 1957) and Ascaris (Savel, 1955), helminthes show limited activity (Min and Seo, 1966). They are capable of absorbing amino acids and other materials from the gut of host.

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