

STORAGE OF FREE AMINO ACIDS IN ASCARIDIA GALLI, A DOMESTIC FOWL NEMATODE PARASITE

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ABSTRACT

Free amino acids in *Ascaridia galli* (Schrank, 1788), Freeborn, 1923 parasitizing domestic fowl host play a very important role in the production of energy by acting as catalysts for various metabolic processes. *A.galli* live in an environment which is rich in protein and free amino acid content. These nematodes have a very free access for the uptake and absorption of the said molecules Shishova and Lev, (1970). Hence in this investigation the study of free amino acids content level is very helpful to understanding to some extent the free amino acid synthesis capacity of nematode parasites i.e. *Ascaridia galli* (Schrank,1788), Freeborn, 1923 from Nanded region (M.S.) India. In present investigation storage of free amino acids in male is 112.09 ± 15.97 and in female is $169.00 \pm 27.23 \mu\text{g}/100 \text{ mg}$ tissue respectively.

INTRODUCTION

Amino acids commonly found in proteins, also occur as free acids. There are number of amino acids which are never found as constituents of proteins, but play important metabolic roles. Therefore, it is essential to study free amino acids. The free amino acid in tissues is small compared with the protein amino acids. There is very little information on the free amino acid of parasitic nematodes. The free amino acid in *A. lumbricoides* is relatively small, about 20 mg/100 g/fresh weight (Barrett, 1981).

Free amino acids act as precursors of many non-protein constituents. These include hormones, vitamins, co-enzymes etc. Protein hydrolyze within the cell by inactivation of enzymes. This autolysis yields amino acids which are available for protein synthesis. All cells require amino acids for the synthesis of proteins. Amino acids are found either in free or bound state. Amino acids distributed in the cytoplasm, act as precursors of protein synthesis and they may be utilized in energy metabolism. The capacity of protein synthesis of the parasites depends on the pool of free amino acids at a given time. In intestinal nematode parasites the amino acid requirements are met from the contents of their hosts as suggested by the Shishova and Lev (1970). Von Brand, (1973) described the free amino acid pool sometimes contains compounds derived from metabolic sequences.

Some workers studied the free amino acid of nematodes those are of Haskins and Weinstein, (1957); Jaskoski, (1960 and 1963); Polyakova, (1965); Purkesya et al., (1970); Okuno, (1971); Remeikis and Medzyavichyus, (1973); Abbas and Foor, (1978); Nigam, (1978).

In present study estimation of free amino acid content *li* from naturally infected host *Gallus gallus domesticus* was performed.

MATERIALS AND METHODS

The total free amino acids were estimated following the method of Moore and Stein (1954).

Nematode parasites of 100-150 mg were homogenized in 2 mL of 10% (w/v) TCA. To ensure proper precipitation of protein content, the homogenates were maintained in cold conditions for 30 minutes. Aliquots of 0.5 mL were made from these samples after filtering them through Watman No.1 filter paper. After adding 2 mL of ninhydrin reagent to the aliquots, they were boiled for 6 minutes. Cooled to room temperature and the contents were made upto 10 mL. The purple colour developed was read at 570 m μ .

The free amino acid content is expressed as $\mu\text{gm}/\text{of}$ tyrosine equivalents/100 mg wet weight.

RESULTS AND DISCUSSION

The content level obtained from the free amino acids are tabulated in the observation Table 1 on this investigation we state that Amino acid content in male and female is 112.09 ± 15.97 and $169.00 \pm 27.33 \mu\text{g}/100\text{mg}$ tissue respectively. The male to female ratio is $0.663 \mu\text{g}/100\text{mg}$ tissue and the female content is higher than male is about 33.67%. The results also suggest that female nematodes are metabolically more active.

The level of free amino acids indicates the metabolic activity of proteins in parasites. The quantitative free amino acid results obtained in the present findings are comparable with study of

Table 1: Free amino acid content in male and female nematode parasites of *Ascaridia galli*.

Sex	Activity Mean \pm S.D.	Male to female ratio	Percentage difference (%)
Male(08)	112.09 \pm 15.97	0.663	33.67
Female(08)	169 \pm 27.23		

other workers Polyakova, (1965), Okuno, (1971), and Nigam, (1978). Free amino acids are quite significant from the metabolic point of view. They are precursors of protein synthesis. They also play a significant role in the protein metabolism leading to the detoxification of metabolic products. The differential levels of amino acids in the nematodes are accompanied by corresponding protein reserves.

Therefore, metabolic differentiation of nematode parasite may be attributed to the dietary proteins of the host

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