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RELATIVE EFFECTS OF DIFFERENT METHODS OF REARING ON THE FREE AMINO ACIDS CONTENT IN THE LARVAL HAEMOLYMPH OF *ANTHERAEA MYLITTA* D. (SATURNIIDAE: LEPIDOPTERA)

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ABSTRACT

The present communication accounts for the relative impact of Indoor and Outdoor rearing of tasar silkworm, *Antheraea mylitta* D. on the number of concentration of free amino acids in their larval haemolymph. The results obtained are indicative of the fact that the number and concentration of free amino acids in the larval haemolymph of *Antheraea mylitta* D. are evidently greater in the Outdoor reared larvae as compared to Indoor reared larvae. The said variation appears due to the differences among the environmental conditions of larval culture of indigenous tasar silkworm.

KEYWORDS: Terminalia tomentosa(Asan), Terminalia arjuna(Arjun), Shorea robusta(Sal), sericologists.

INTRODUCTION

The present communication tasar silkworm Antheraea mylitta D. belonging to family Saturniidae of order Lepidoptera is the principal tasar silk producing insect of great commercial importance. It is usually reared on the foliages of tasar host plants namely *Terminalia tomentosa*(Asan), *Terminalia arjuna*(Arjun) and *Shorea robusta*(Sal) in the forest areas under the outdoor conditions in the tropical tasar silk producing belts of India. Tasar silkworms are by and large wild polyphagous and bivoltine in nature. However attempts have

been taken by several sericologists for the Indoor larval culture of tasar worms in order to protect it from vagaries of outdoor larval culture which aims at protecting the tasar larvae under Indoor conditions for better productivity of tasar cocoons. Jolly (1971) developed a new technique of indoor rearing of tasar silkworm under the controlled laboratory conditions with desired productivity of tasar cocoons. A comparative study on the laboratory culture of different ecotypes of *Antheraea mylitta* D. has been successfully carried out by Pandey et.al. (1990). Agrawal et.al. (1974) found evident variation in the free amino acids contents in the larval haemolymph of tropical tasar silkworm under healthy and diseased larval conditions. Anonymous (2008) presented quantitative and qualitative details of vanya silk produced by the non-mulberry sericigenous insects. Mohan et.al. (2012) explored the possibilities of third sericulture crop under artificial regulated desired conditions. Mishra (2014) reported significant role of foliar constituents on the growth and development of tropical tasar silkworm. Sharma et.al. (2013) mentioned the significant role of environmental factors on the rearing performances of tasar silkworms in relation to productivity and quality of tasar cocoons since the tasar silkworms require conducive and suitable environmental optimum conditions for their desired behavioural manifestations. Kumar (2016) mentioned the impact of dietary conditions conditions on the free amino acid content in the larval haemolymph of *Antheraea mylitta* D. based on the quality of foliages used during the larval culture of tasar silk producing insects. Krishnaswamy (1973) suggested different methods for silkworms rearing.

MATERIALS AND METHODS

Fifth stage tasar larvae of *Antheraea mylitta* D. of same age obtained from the larval culture under the Indoor and Outdoor methods of rearings on the foliages of *Terminalia arjuna* host plant were considered for the biochemical analysis of free amino acids number and concentration in their larval haemolymph under the normal laboratory conditions. 1ml. larval haemolymph of *Antheraea mylitta* D. under the two different methods of larval rearing was taken separately for the analysis of free amino acids. Analar chemicals were used for the experiment. Haemolymph was deproteinised with ethanol (70% v/v) and was further centrifuged for 10minutes at 3000r.p.m. The protein free clear sample was evaporated to dryness at water bath. Fats and lipids were removed by extracting the residue with ether (1ml.) and thereafter the residue was dissolved in isopropanol (1.5ml 10%v/v). All the extracts were prepared in the same manner and used for double dimensional paper partition chromatography. 10ml. extract was applied on the whatman no.1 filter paper (20x20cm.). The

chromatograms were first run in butanol: acetic acid : water (4:1:5 v/v). The chromatograms were further dried at room temperature. Further the chromatograms were sprayed with ninhydrine solution in acetone (0.25% w/v). The sprayed chromatograms were heated in an air oven at 100degree for 20minutes. The amino acids were later identified by comparing R.F. values with known standards running under the same experimental conditions. The results obtained in relation to two different methods of larval rearing in respect of free amino acids contents were tabulated in the forms of traces (+-), present (+), absent (-) and higher concentration (++) and presented in the table.

RESULTS AND DISCUSSIONS

Results obtained as per the table clearly indicate that the number and concentration of free amino acids in the larval haemolymph of *Antheraea mylitta* D. are relatively greater in the larvae reared under the natural outdoor condition than the larvae reared under the artificial controlled Indoor condition. The total number of free amino acids in the outdoor reared larvae is 19 where it is 17 under the Indoor reared larvae of tasar silkworm. The Leucine and Methionine sulphoxide are altogether absent in the larval haemolymph of indoor reared larvae of *Antheraea mylitta* D.

Table. 1: Table showing relative impact of Indoor and Outdoor methods of larval rearing on the free amino acids contents in the larval haemolymph of *Antheraea mylitta* D.

Sl. No.	Free Aminoacids	Indoor Rearing	Outdoor Rearing	C.D. at 0.5% level for F.A.A.
1	Cysteic acid	+	++	(H.S.) : Highly Significant
2	Aspartic acid	+	+	
3	Glutamic acid	+	+	
4	Lysine	++	++	
5	Serine	+-	+	
6	Glycine	+-	+	
7	Alanine	+	++	
8	Glutamine	+	++	
9	Proline	+-	+	
10	Tyrosine	+	+	
11	Threonine	+	+	
12	Histidine	+	++	
13	Arginine	++	++	
14	Methionine Sulphoxide	(-)	+	
15	Valine	+	+	
16	Leucine/Isoleucine	(-)	++	
17	B.alanine	+	+	
18	Asparagine	+	+	

19	Cystine	+	+	
	Total	**17**	**19**	

+ = Present +- = Traces

- = Absent ++ = Abundant

Further under Indoor larval rearing the serine, glycine, proline have been found in traces unlike Outdoor method of larval rearing. The cysteic acid, Lysine, Alanine, Glutamine, Histidine, Argine and Leucine/Isoleucine are in abundance in the larval haemolymph of outdoor reared tasar larvae whereas Lysine and Arginine have shown their abundance in the larval haemolymph of indoor reared tasar larvae. Thus the results obtained are indicative of the fact that the outdoor reared larvae of *Antheraea mylitta* D. have registered their significant supremacy over indoor reared larvae in respect of number and concentration of free amino acids in the larval haemolymph.

The aforesaid variation of free amino acids in the larval haemolymph of indigenous tasar silkworm under the two different methods of larval rearing becomes clear when one takes note of the fact that the tasar silkworms are wild in nature and prefer natural outdoor environmental conditions for their desired biological manifestations as compared to indoor artificial condition. It appears that the differences in the dietary and environmental conditions between the outdoor and indoor methods of larval rearing of *Antheraea mylitta* D. are the potent factors for the results so obtained and it is very much inconfirmities with the earlier investigations carried out by several sericologists in the field of sericulture.

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