

RELATIVE IMPACTS OF SOME FACTORS ON THE BIO-CHEMICAL CONTENTS OF TASAR SILKWORM, *Antheraeamylitta* D. (SATURNIIDAE: LEPIDOPTERA)

DR. KUMARI SHOBHA RANI

Assistant professor, Department of Zoology, D.N.College, Masaurhi (Patna)

ABSTRACT: *The present communication accounts for the relative effects of some factors namely seasons, diet and sex on the biochemical manifestation of tasar silk producing insect, Antheraeamylitta D. The results obtained are indicative of the fact that the different seasons, diet and sex influence the biochemical make up of tasar silkworm in respect of number of free amino acids (F.A.A.), percent protein, carbohydrate and lipid contents as evidenced by the biochemical analysis of haemolymph of Antheraeamylitta collected from the different tropical tasar producing belts in India. The observations reveal that the significant bio-chemical variations do exist-at different stages of life cycle of tasar silkworms in relation to said intrinsic factors.*

Keywords: **Tasar Silk, Haemolymph, Silkworms, Antheraeamylitta, A-Mylitta, Amino acids, etc.**

1. INTRODUCTION

India enjoys the unique distinction of being the only country in the world, which produces all the four important varieties of silks viz; mulberry, tasar, eri and muga. Among the no I-mulberry silk, the tasars silk produced by different species of *Antheraea* namely *Antheraeamylitta*, *Antheraeapernyi*, *Antheraeayamamai*, *Antheraearoylei* and *Antheraeaproylri* are of great commercial importance. However, the Indian tasar silk worm, *Antheraeamylitta* so called tropical tasar silkworm

existing under the forest areas of Bihar, Madhya Pradesh, Orissa, West-Bengal, Maharashtra, Jharkhand and

Uttar Pradesh is famous and usually reared under wild conditions by the poor rearers on different tasar host plants viz; *Terminalia tomentosa*, *Terminalia arjuna*, *shorearobusta* and also on some secondary food plants during the seed crop and commercial crop seasons. It is worthwhile to mention that the biochemical contents of silk producing insects play vital role in the life processes subsequently influencing the productivity as well as the quantity of silk yarn. Some notable investigations on the behavioural and biochemical manifestations of silk insects have been carried out by Jolly (1960), Jolly et al. (1977), Krishnaswamy (1973), Pandey (1989), Reddy et al. (2010), Satyanarayana et al. (2009), Rahul (2014) and many others.

The present study has been designed to evaluate the relative impacts of two seasons (seed crop and commercial crop) two different diets (primary and secondary) and different sex (Male and female) on the biochemical contents such as free amino

acids, protein, carbohydrate and lipid in the haemolymph of A-mylitta collected from tasar silk producing belts of our country in order to search out suitable condition for desired productivity and quality of tasar silk yarn.

2. MATERIAL AND METHOD

Biochemical analysis of haemolymph tasar silkworm *Antheraea mylitta* D. collected from the rearing sites of Bihar, Madhya Pradesh, Orissa, West Bengal and Uttar Pradesh in respect of Free amino acids, protein, carbohydrate and lipid at different stages of its life cycle were carried out under laboratory condition as per the method suggested by Jolly and Sinha (1971). The results obtained in relation to two diverse factors season, diet and sex on biochemical contents of tasarworm were carefully recorded in the tables 1 to 4.

During the course of experiment two different seasons namely seed crop (July-Aug), and commercial crop (Sept-Oct), two different diets namely primary food plant (*Terminalia Arjuna*) and secondary food plant (*Terminalia belerica*) and finally two different sex (Male and female) were considered as factors for evaluating the biochemical variations among the tasar silkworm, *A mylitta*.

3. RESULTS AND DISCUSSION

Perusal of the tables 1 to 3 clearly indicate that the number of free amino acids (F.A.A.) in the haemolymph of tasar silkworm, *Antheraea mylitta* D. evaluated from the five ecological habitats of tasar producing states present evident variations in relation to two different seed crop and commercial crop seasons (F.A.A.=14.6:17.0), two different qualities of feeding on the foliages of primary food plant (F.A.A.=15.0:18.0). It is further clear that the tasar worms existing under the ecological conditions in the state of Bihar, Madhya Pradesh and Orissa carry relatively greater free amino acids contents as compared to the tasar worms existing in the states of West Bengal and Uttar Pradesh. This presents variations in free amino acids contents in the haemolymph of *A-mylitta* in relation to diverse ecological conditions of different states in India.

Table:1

Table showing variations in the Free amino acids contents in relation to seasons

Sl. No.	Tasar producing states	Number of F.A.A seed crop season	Number of F.A.A Commercial crop season	C.D. at 0.5% level in relation to seasons
1	Bihar	17	19	
2	Madhya Pradesh	16	18	
3	Orissa	14	17	
4	West Bengal	14	16	
5	Uttar Pradesh	12	15	
Average		14.6	17.0	

Table : 2

Table showing variations in the Free amino acids contents in relation to diets.

Sl. No.	Tasar producing states	Number of F.A.A on Primary diet	Number of F.A.A. On secondary diet	C.D. at 0.5% level in relation to diets
1	Bihar	19	13	H.S.
2	Madhya Pradesh	18	10	
3	Orissa	17	09	
4	West Bengal	14	09	
5	Utter Pradesh	14	08	
Average		16.4	9.6	

Table : 3

Table showing variations in the Free amino acids contents in relation to sex

Sl. No.	Tasar producing states	Number of F.A.A In Male	Number of F.A.A. In Female	C.D. at 0.5% Level in relation to sex
1	Bihar	17	19	H.S.
2	Madhya Pradesh	15	19	
3	Orissa	14	18	
4	West Bengal	14	17	
5	Uttar Pradesh	14	15	
Average		15.0	18	

Likewise the percentage concentration of protein, carbohydrate and lipid in the haemolymph of *Antheraea mylitta* the Indian tasar silkworm also present significant variations at different stages of its life style in relation to different seasons, dietary changes and sex differences in spite of its existence in different ecological habitats of five tasar producing states as per the table 4.

Table : 4

Table showing variations in protein, carbohydrate, lipid contents in the haemolymph of *A. mylitta* in relation to season, diet & sex

Stages	Seasons		Diets		Sex		C.D. at 0.5% level for character
	Seed crop	Commercial crop	Primary	Secondary	Male	Female	
Larval	62.83	63.93	63.5	16.4	61.2	64.5	H.S.
Pupal	60.92	62.85	61.3	13.9	60.1	62.5	
Adult	66.83	68.71	68.4	14.3	62.5	65.9	

4. CONCLUSIONS

It is thus very clear that the biochemical contents in the haemolymph of tasar silkworm, *A. mylitta* is evidently influenced by season, diet & sex. The results obtained has shown that the commercial crop season, primary food plant and female sex among the tasar silkworm have registered their supremacy over seed crop season, secondary food plant and male sex of *A. mylitta* in respect of biochemical contents inspite of its diverse habitat condones at different stages of its life cycle which is very much in conformities with the earlier works carried out by Jolly et al. (1977), Krishnaswamy (1973), Pandey (1989), Satyanarayana (2009) and Reddy et al. (2010) and stand to meaningful conclusion.

ACKNOWLEDGMENT

One of the authors **DR. KUMARI SHOBHA RANI** takes this opportunity to thank Prof. (Dr.) K. B. Sharma (M.Sc., Ph.D), Retired Professor, University PG Department of Zoology, Magadh University, Bodh Gaya, Bihar (INDIA), for numerous discussions, valuable suggestion and help in preparing the present research paper for publication. I also feel indebted to some scientific spiritualists who provided us the enthusiasm to undertake scientific studies with a wholesome attitude.

REFERENCES

1. Jolly, M.S. (1960): *Tasar Research Scientific Brochure*, Central silk Board, Bombay, pp. 1- 40.
2. Jolly, M.S. and Ahsan, M.M. (1977): Some studies on the reproductive behaviour of the tropical tasar silkworm *Antheraea mylitta* D. C.T.R.S. Ann rep. pp. 93 - 97.
3. Krishnaswamy, S. (1973): *Sericulture Manual-2, silkworm rearing* F.A.O. Agric. Services, Bull. 15/2 Rome: 51 - 53.
4. Pandey, V. (1989): *Behavioural and Biochemical investigations on the laboratory culture of Indian tasar silkworm, A. mylitta*. Doctoral thesis (Zoology) M.U.Bodh Gaya.
5. Reddy, R.M. and Sinha, A.K. (2010): Parental combination and rearing season compatibility for silk yield in tropical tasar silkworm, *A. mylitta* D. World applied sciences journal 9(8):855-859.
6. Satyanarayana K.S. and Acharya, s. (2009): SGSY, Special project for tasar development in Bihar and Jharkhand. *Indian silk* 48(4): 4- 8
7. V.Pandey (2014): Performance of various mulberry cultivars on development of silkworm hybrid of *Bombyx mori* L. *Eco-scan* vol.(5). pp. 285 - 294