

RELATIVE EFFECT OF SEASONAL CHANGES ON THE REARING PERFORMANCES OF *Antheraea mylitta* D.

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ABSTRACT

Antheraea mylitta D. belonging to family saturniidae of order Lepidoptera is popular indigenous tasar silkworm usually reared on the foliages of tasar host plants in the forest areas of tropical tasar silk producing belts in India during the seed crop (July-August) and commercial crop (September-October) seasons. The rearing performances of *Antheraea mylitta* during the commercial crop season as compared to seed crop season have been found relatively better and significant in respect of productivity and quality of tasar cocoons evidenced by the effective rate of rearing (E.R.R.%), cocoon weight, shell weight, shell ratio and filament length. The said, variations appear to be the outcome of relative impact of different environmental factors on the larval culture of tasar worms during the two different seasons of rearing. The commercial crop season is supposed to provide relatively better conducive and desired environment than the seed crop season in course of larval rearing of *Antheraea mylitta* D.

Key Words:- Saturniidae, Lepidoptera, Indigenous, Foliages, Conducive, Rearing, E.R.R., Shell weight, Shell ratio,

INTRODUCTION

Sericigenous insects are well known for producing the natural silks viz; mulberry, tasar, eri and muga in mulberry and non-mulberry sectors of great commercial importance. Among these tasar silk is usually produced by different species of *Antheraea* such as *Antheraea mylitta* D., *Antheraea pernyi*, *Antheraea roylei*, *Antheraea proylei*, *Antheraea yamamai* etc. under outdoor conditions. Tasar silkworms are wild, phytophagous, bivoltine/trivoltine in nature and follow a long days pupal diapause during the period of winter and summer.

Antheraea mylitta D. belonging to family saturniidae of order Lepidoptera is an indigenous tasar tasar silk producing insect and usually reared on foliages of tasar host plants namely *Terminalia arjuna*, *Terminalia tomentosa* and *Shorea robusta* in the tasar producing tropical belts of India during the seed crop (July-August) and commercial crop (September-October) seasons.

Thiagarajan, et al. (1993) revealed that the strains of mulberry silkworm, *Bombyx mori* L. differ in their biological manifestations in relation to impact of seasonal changes. Renuka, et al. (2013) observed rich biological diversities of tasar silk producing insect, *Antheraea mylitta* D. mainly due to its wide range of distribution, climatic factors, seasonal changes and food plants etc. which have led to made variation in their ethology, physiology and commercial traits. Jolly, et al. (1979) presented a comparative picture of non-mulberry silk insects in relation to their behavioural manifestations under the different environmental conditions and found significant variation in their quantitative and qualitative performances. Shiva Kumar, et. al. (2011) observed significant impact of environmental factors on the rearing performances of *Antheraea mylitta* D. Rahmathula, et al. (2012) revealed evident impact of seasonal variation on the food consumption and conversion and assimilation efficiency of mulberry silk producing insect, *Bombyx mori* L. Khaton, et al. (2018) found the significant impact of environmental factors on the laboratory culture of tropical tasar silkworm in relation to its rearing, breeding and reeling performances during two different seasons of larval culture.

MATERIALS AND METHODS

Healthy tasar cocoons of *Antheraea mylitta* D. (Daba) were collected from the rearing site of Jharkhand and stored under normal laboratory conditions for a week in view of proper acclimations. The tasar cocoons of uniform size and weight were carefully associated and thereafter the grainage operations in respect of emergence of moths, coupling, egg laying and hatching of eggs were carried out during the seed crop (July-August) and commercial crop seasons as per the methods suggested by Krishnaswamy, et al. (1973). The larval rearing of tasar worms during the seed crop and commercial crop seasons were carried out on the foliages of *Terminalia arjuna* (Arjun) tasar host plant under the outdoor conditions till the formation of tasar cocoons. The relative data in respect of effective rate of rearing (E.R.R.%), cocoon weight, shell weight, shell ratio and filament length during two different seasons of larval rearing of *Antheraea mylitta* were collected, analysed and finally recorded in the table 1. Following formulae were used in order to calculate E.R.R. and shell ratio of *Antheraea mylitta* D.

Apart from this tasar cocoons were selected randomly and weighed to determine average cocoon weight. Further the cocoons used for determining the average single cocoon weight were cut open and weighed to obtain shell weight in gram.

RESULTS AND DISCUSSION

Results obtained are indicative of the fact that the rearing performances of tropical tasar silkworm, *Antheraea mylitta* D. in respect of E.R.R. (48.0% and 59.0%), cocoon weight (10.18gm. and 12.75gm.), shell weight (1.43gm. and 1.68gm.), shell ratio (11.25% and 12.94%) and filament length (693mtr. and 780mtr.) during the seed crop (July-August) and commercial crop (September-October) present significant variation among themselves showing evident impact of seasonal changes on the rearing performances of *Antheraea mylitta* in relation to two different seasons of larval culture.

Jolly, et al. (1979) revealed that the tasar silkworm essentially requires optimum environmental conditions for its desired biological and behavioural manifestations. Shiv Kumar, et al. also observed significant impact of environmental and dietary conditions on the rearing performances of tropical tasar silkworm. Ramathula, et al. (2012) mentioned the impact of seasonal changes on the quality of foliage of tasar host plant and its subsequently effect on consumption by the mulberry silkworm. In the light of said facts it appears that the commercial crop season as compared to seed crop season relatively provide better suitable and conducive environment for the superior behavioural manifestations of *Antheraea mylitta* D. as such results obtained stand to logical and meaningful conclusion and very much inconformities with the earlier investigations carried out by the different sericologists.

REFERENCES

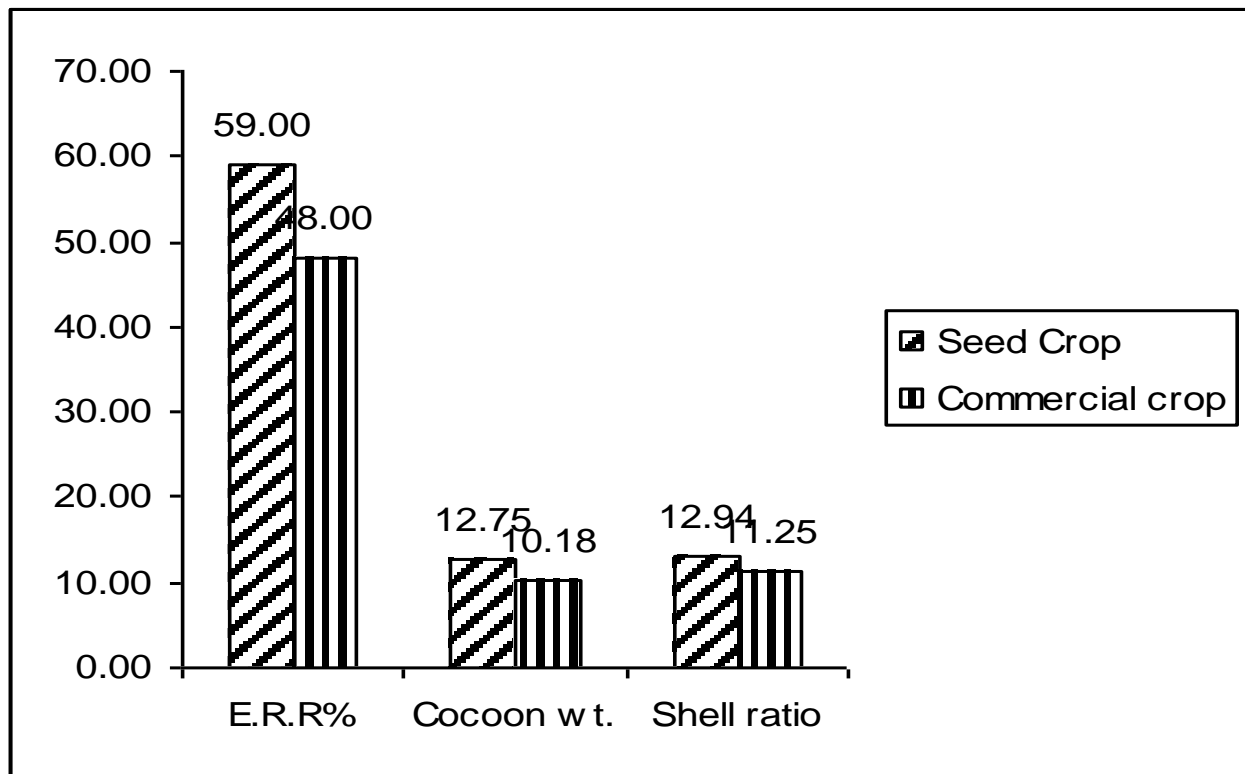
- Jolly, M.S.; Sen, S.K.; Sonwalkar, T.N. and Prasad, G.K. (1979) : Non-mulberry Silks. Manual on Sericulture, Vol. (4) : 146
- Krishnaswamy, S.; Narshimhanna, M.N. and Suryanarayan (1973) : Sericulture Manual-2. Silkworm rearing. F.A.O. Agri. Services Bull. 15/2 : 1-131.
- Khatoon, Z.F.; Singh, V.K. and Ali, Sarfaraz (2018) : Effect of environmental factors on the laboratory culture of Tasar Silkworm, *Antheraea mylitta* D. World Journ. of Pharmaceutical Research, Vol. (7), pp. 948-954
- Lokesh, G.; Srivastava, A.K. and Sahay, A. (2016) : Seasonal climatic influence on the leaf biochemicals of sal (*Shorea robusta*) flora and in situ breeding behaviour of Laria eco-race of *Antheraea mylitta* D. Journ. of Entomology and Zoology Studies 4(6) : 57-62.
- Renuka, G. and Shamitha, G. (2013) : Studies on the bio-diversities and ecological aspects of Tasar Silkworm, *Antheraea mylitta* D. Int. Journ. of Env. Science, Vol. (4) : 131-139.

- Rahmathulla, V.K. and Suresh, Suresh, H.M. (2012) : Seasonal variation in food consumption, assimilation and conversion of efficiency of *Bombyx-mori* L. Journ. of Insect Science 12(82) : 1-14.
- Shiv Kumar, G.; Shamitha, G. and Purshotam, R. (2011) : Studies on the impact of environmental factors on the rearing performances of tasar silkworm, *Antheraea mylitta* D. Sericologia 51(3) : 397-408.
- Thiagarajan, V.; Bhargava, S.K. and Naga Raj, B. (1993) : Differences in seasonal performances of twenty six strains of silkworm, *Bombyx-mori* L. Journ. of Lepidopteran Society (47) : 321-337.

Table - 1

Table showing relative impact of seed crop and commercial crop seasons on the rearing performances of tropical tasar silkworm, *Antheraea mylitta* D.

Sl. No.	Rearing parameters (Av.)	Seed crop (July-Aug.)	Commercial crop (Sep.-Oct.)	C.D. at 5% level for characters
1.	E.R.R. (%)	48.0%	59.0%	*
2.	Cocoon weight (gm.)	10.18±1.28	12.75±1.21	*
3.	Shell weight (gm.)	1.43±0.32	1.68±1.23	*
4.	Shell ratio (%)	11.25	12.94	*
5.	Filament length (mtr.)	693	780	**



Histogram showing relative variation in E.R.R. cocoon weight and shell ratio of *Antheraea mylitta* D. in relation to seed crop and commercial crop seasons of larval culture.