

Studies On Impact Of Two Different Methods Of Larval Culture On The Productivity And Quality Of Tasar Cocoons Of *Antheraea Mylitta* D.

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ABSTRACT

The Indian tasar silkworm *Antheraea mylitta* is natural fauna of tropical India, distributed in different geographical locations and habitats in this country. Possibly because of the distinct ecological conditions prevailing in these different localities, several morphological variants, traditionally called ecoraces have been identified in *Antheraea mylitta*.

In present paper we found that both Indoor and outdoor methods are viable for the larval culture of Daba ecotype of *Antheraea mylitta* as for as productivity and quality of tasar cocoons but the effective rate of rearing under Indoor method is relatively better than outdoor method. However, the quality of tasar cocoons in respect of cocoon weight, shell weight and filament length have been found relatively better under outdoor condition.

INTRODUCTION

Method of larval culture is the process by which cocoons are harvested for the silk. Two methods of larval culture namely Indoor method and outdoor method of rearing which effects rate of rearing(production) cocoon weight, shell weight, shell ratio and filament length of Daba ecotype of *Antheraea mylitta* as well as quality of tasar. It is indigenous tasar silk producing insect distributed over different ecopockets in tasar silk producing area. So the popular type is Daba existing in different localities of tasar culture belts in India.

Since *Antheraea mylitta* primarily in habits forest habitats, it is excepted that with the gradual deptetion of forest cover due to surge in the human activities the habitat lost its continuity and resulted in geographic isolation. A number of morphologically well defined ecotypes, are known for this species. It is wild polyphagous and bivoltine or trivoltine in nature.

MATERIAL AND METHODS

Cocoons of *Antheraea mylitta* were produced from supply station of Chaibasha (Jharkhand) in the month of June and carefully transported to Bodh-Gaya and acclimatised under both Indoor and outdoor conditions. The cocoons were selected according to their weight, size, healthy and unhealthy conditions. The desire moths were kept in monias of 6" × 6" × 4" size for 1 to 2 hrs. The male moths were rejected after coupling and female moths were allowed for egg laying separately at the temperature range of 260-280C and 70-80% R.H.

The selected eggs were put for incubation usually for a week or less till hatching. The hatched first stage larvae were immediately brushed on the foliages of the host plants till cocoon formation in both Indoor and outdoor conditions. The essential steps of grainage were followed as per the methods suggested by Krishnaswamy, 1973. New hatched larvae of *Antheraea mylitta* were brushed on the foliages of tasar host plants till the formation of tasar cocoons under the experimental method and the rearing of tasar larvae were carried out during the Indoor and outdoor methods.

During the rearing of the larvae of *Antheraea mylitta* at initial stages were carried out for the different samples of experiment and after that the analysis of tasar cocoons in respect of effective rate of rearing (E.R.R. %), cocoon weight, shell weight, shell ratio, filament length were made and results were recorded. The rearing and cocoons analysis were carried out as per the method suggested by Jolly, et al., 1974.

OBSERVATION

Impact of two different methods of larval culture on the productivity and quality of tasar cocoons namely Indoor method and outdoor method of rearing. We found that in Indoor performance in respect of its average E.R.R.%, cocoon weight (gm.), shell weight (gm.), shell ratio (%) and filament length (mtr.) are respectively in the tune of (42.0%, 10.60gm., 1.34gm., 11.61% and 643mtr.) but on the outdoor

rearing preference of Daba ecotype of *Antheraea mylitta* in respect of its productivity and quality of tasar cocoons in respect of average E.R.R.%, cocoon weight (gm.), shell weight (gm.), shell ratio (%) and filament length (mtr.) are respectively in the tune of (38.00%, 11.61 gm., 1.47gm., 11.84% and 682mtrs.).

So it is very clear that the two methods of larval culture of Daba ecotypes are significant and present evident variation in respect of their quantitative and qualitative characters. So we can say that the effective rate of rearing (E.R.R.%) under Indoor method as compared to outdoor method has been found relatively better showing in greater productivity of tasar cocoons than outdoor method of conventional rearing. But the quality of Daba tasar cocoons in respect of cocoon weight, shell weight and filament length have been found relatively better under outdoor condition than the Indoor condition of larval culture. However, the quality of tasar cocoons of Daba ecotype of *Antheraea mylitta* does not get adversely affected under Indoor method of tasar culture. Thus it is protected the developing larva from the pests, predator, diseases and vagaries of nature to a greater extent and these factors evidently reduce the chances of larval mortalities to greater extent as compared to outdoor, the uncontrolled method of larval culture. Thus the better productivity (E.R.R. %) of Daba ecotype under Indoor method than outdoor method of larval culture appears to be the logical outcome and raises no doubt at all.

Table showing relative Indoor and Outdoor rearing performances of Daba ecotype of *Antheraea mylitta* D.

S.N.	Rearing Parameters	Indoor culture	Outdoor culture	C.D. at 0.5% level for characters
1.	Av. E.R.R. (%)	42.00	38.00	**
2.	Av. cocoon weight(gm)	10.60	11.61	**
3.	Av. shell weight (gm)	1.34	1.47	*
4.	Av. shell ratio (%)	11.61	11.84	N.S.
5.	Av. Filament length (mtr.)	643	682	**

(N.S. : Not Significant, **: Highly Significant and * : Significant)

DISCUSSION

Jolly, et al. (1979) mentioned that the non-mulberry sericigenous insects are large wild in nature and prefer natural wild conditions particularly the forest areas for their desired biological manifestations. But

the vagaries of nature, disease pests and predators adversely affect the survival of insects under natural outdoor conditions of existence. Mohanthy, et al. (2007) have worked on the bionomics and ecoraces analysis of indigenous tasar silk producing insects and reported that the ecoraces of *Antheraea mylitta* prefer wild conditions for their desired natural activities. Sharma, et al. (2009) mentioned that the tasar culture being practiced under outdoor conditions suffers great loss of crop in the tune of 20% to 40% due to hazards of nature climate fluctuations, pests predator and disease.

The Indoor rearing of tasar larvae under controlled conditions of larval culture has become feasible and viable proposition in order to raise the productivity of tasar cocoons to an acceptable extent. Shamitha (2008) reported about the successful total larval culture of tasar silkmoth with desired productivities and qualities of tasar cocoons and said that Indoor biotechnique is better tool for raising the tasar crop by regulating the needed conditions of larval culture under the Indoor condition. The tasar worms have no problem in accepting the domesticated condition or rearing if the dietary condition and optimum environmental conditions are being maintained under the Indoor larval culture of tasar worms. Jolly, et al. (1975) have mentioned that the Indoor culture of tasar larvae reduces the chances of larval mortalities from unfavourable environmental hazards as well as the natural enemies of tasar worms and creates better scope for the productivity of tasar cocoons without affecting its qualities.

Further as per observation the quality of the cocoons in respect of reeling characters of Daba ecotype has been found relatively better under outdoor method of larval culture than the Indoor method of larval culture of said ecotype. Thus the result is very clear that the Daba ecotype of *Antheraea mylitta* is actually a wild tasar silkworm and prefer wild and outdoor conditions for its various behavioural manifestation by avoiding the domesticated condition of its survival and performing its natural condition. So we can say that to this wild natural ecotype the natural outdoor conditions are more suitable insisting the desired growth and development of tasar silkworm. This is perhaps the potent factor by which the reeling characters of ecotype is relatively better under natural outdoor condition of rearing than the domesticated condition of Indoor rearing. Jolly, et al. (1972) while working on the microbial activities

of pathogens causing diseases to tasar silk worms reported that the tasar culture being practiced under outdoor condition suffers great loss of crops due to disease like microsporozoasis, bacteriosis, virosis and mycosis. Dhal (1999) investigated the impact of abiotic factors of environment on the biological behavior of tasar silkworm *Antheraea mylitta* D. and found that the variations in temperature, photoperiod, humidity and soil conditions are the potent factors influencing the biology of tasar silkworm. Dash, et al. mentioned the higher rate of mortalities of tasar larvae under the wild conditions of tasar culture due to vagaries of nature. Vinita (2016) worked on the impacts of diseases on the biochemical contents of tasar silkworms and reported that the diseases of tasar silkworms namely microsporozoasis, bacteriosis, virosis and mycosis impair the growth of tasar worms and upset the biochemical make up by sharp deterioration of chemical contents of body like protein, carbohydrate and lipid.

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