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Effect of Feeding Trial on Commercial Characters in Tropical Tasar Silkworm *Antheraea mylitta* Drury

G.S. Singh*, S.S. Rath, S.S. Singh, M.K. Singh and N.B. Vijayaparakash
Central Tasar Research and Training Institute
Nagri
Ranchi (Jharkhand); India.

Abstract : Tasar silkworm *Antheraea mylitta* D. is a polyphagous insect and is reared out door on the food plant like as *Terminalia arjuna, Terminalia tomentosa, Shorea robusta*. Productivity of cocoon in outdoor rearing is poor due to attack of number of pests and predators besides natural vagaries such as, wide fluctuating temperature, heavy rain and stormy wind etc. Attempts were made in the past to increase the cocoon production by adopting various methods of indoor rearing particularly for early instar worms and also by improving the rearing conditions. The present study of indoor rearing was conducted in wooden tray supported with wooden rearing frames specially designed for young age and late age silkworms. Trials were taken up to determine optimum number of feeds per day for indoor rearing of tasar silkworm. Three feed per day resulted significantly higher effective rate of rearing (35% and 30 % during I and II crop respectively). Significant increase in commercial characters (cocoon weight and shell weight) was observed under three feedings condition than other feeding treatments.

Key words : *Antheraea mylitta*, Indoor rearing, Wooden rearing frame.

Introduction

The tropical tasar silkworm, *Antheraea mylitta* D is polyphagous insect. It is commercially reared out doors on its primary food plants, *Terminalia arjuna*, *Terminalia tomentosa*, and *Shorea robusta*. Traditional rearing method of tasar silkworm on nature grown forest plantations has many disadvantages like erratic climatic conditions, lack of watch and ward and free access to parasites, pathogens and predators lead to extremely low returns. There is heavy population loss to the tune of 50-55% in early instars due to pests and predators attack during out door rearing condition but during indoor rearing early instars loss can be reduced (Jolly *et al.*, 1974, 1979; Mathur *et al.*, 1999). It is pertinent to ensure higher recovery which is possible only in rearing the silkworm under controlled condition. Domestication of silkworm *i.e.* the indoor rearing technique at the Institute level has been tried by many scientists to study the nutritional ecology (Rath *et al.*, 1999; Ojha *et al*., 2000; Sinha *et al*., 2000). But work is still required to standardize the indoor rearing technique for domestication of silkworm for higher survivability. Insects attain their functional optima through intake and growth target (Raubenheimer and Simpson, 1999) and any change in intake and growth targets will lead to physiological disturbance affecting at its performance level. Keeping view, the present study was carried with an object to find out optimum number of feeds/day to meet the consumption level for better growth, development and cocoon production of tasar silkworm in indoor condition.

Materials and Methods

The experiment was conducted at Central Tasar Research and Training Institute, Nagri, Ranchi, Jharkhand during July to October.

a. The rearing tray

Specially designed wooden trays (3'LX 2'W X 4"H), with wire meshed bottom were used for early and late instar rearing. Wooden rearing frame of smaller size (1'L X 1'W X 3"H) (Fig. 1) was provided for young age (up to II instar) rearing, while rearing frame of bigger size (2.5'L X 1.5'W X 4"H) (Fig. 2) was provided for late age rearing (III instar onwards). News papers were used on the bottom of the tray for absorbing the litter moisture. Trays were arranged on the bamboo racks inside the rearing room. Temperature (25-28°C) and relative humidity (75-85 %) were maintained inside the rearing room.

b. Rearing technique

Antheraea mylitta (Lepidoptera: Saturniidae; Daba bi-voltine eco-race) larvae (fresh and healthy) hatched during the first week of July (I Crop) and first week of

*** Corresponding author :** G. S. Singh, Central Tasar Research and Training Institute, Nagri, Ranchi (Jharkhand); India; E-mail: *jayaraj625@yahoo.co.in*

Table 2: Effect of frequency of feeding on commercial characters of cocoons

Treatments	Cocoon weight(g)			Shell weight(g)			Silk ratio (%)		
	I Crop	II Crop	Mean of two crops	I Crop	II Crop	Mean of two crops	I Crop	II Crop	Mean of two crops
T1	9.12	9.33	9.22	0.95	1.1	1.02	10.41	11.78	11.09
T2	10.8	11.21	11	1.35	1.4	1.37	12.5	12.48	12.49
T3	11.85	11.95	11.9	1.52	1.54	1.53	12.82	12.88	12.85
T4	10.22	10.12	10.17	1.24	1.22	1.23	12.13	12.05	12.09
T5	12.25	12.85	12.55	1.65	1.74	1.69	13.46	13.54	13.5
C.D. at 5%	0.93	0.64	0.79	0.16	0.12	0.14	NS	NS	NS

cocoon weight and shell weight followed by T3 than others treatment groups. In all the cases T1 has registered low values of cocoon weight and shell weight, while Silk Ratio (SR) % did not change statistically.

The ERR% during II crop rearing (irrespective of condition) remains significantly at lower level than that of II crop rearing. While the decline in ERR% in T5 was recorded lowest (7.7%), it was high for T1 (33.3%), followed by T4, T2 and T3. The commercial characters of cocoons did not differ statistically among I and II crop rearing.

Discussion

The success obtained in the present attempt, at indoor rearing up to cocooning, was due to the introduction of wooden rearing frame. Such special type support was not used in earlier attempts for rearing of *A. mylitta* (Jollly, 1972 and Jollly *et al.,* 1974, 1979; Thangavelu and Sahu, 1983; Tikoo and Singh, 1990; Thangavelu *et al.,* 1993; Ojha *et al.,* 1994). Rearing till cocoon formation was conducted in wooden tray having specially designed frames to facilitate cocooning and restrict the worm inside the tray (Negi *et al.,* 2004 and Prasad *et al.,* 2005). Three feed per day (T3) resulted significantly higher ERR during I and II crop, respectively as against minimum ERR of 18% and 12 %, respectively, which was recorded under one feeding (T1) (Table 1). The survivability of worms has increased following fresh food three times a day. In this method of indoor rearing it was observed that newly hatched larvae remained on leaves feeding voraciously since the frame was raised from bottom to surface of the tray. The frame prevents the leaves touching the tray of bottom and sides walls, resulting restriction migration of worms out of the tray. Late age worms (from 3rd instar onwards) were reared on the bigger rearing frame because they required larger spaces for their movements and have many advantages. It is provided with 4" height stand at four corners raising it above the tray bottom and silkworm can not touch the tray bottom and sides owing to is size. Bigger frame supports comparatively large quantity of leaves and thus facilitates the bigger larva to feed.

Silkworms passing last excreta were picked up and put in a separate tray over matured leaves kept on late age rearing frame for cocoon spinning. Late age rearing frames was also found very helpful during cocoon formation. The bigger rearing frame provides optimum space is for hammock, ring and peduncle formation.

The present study indicates the feasibility of indoor rearing of tasar silkworm *Antheraea mylitta* in wooden tray along with wooden rearing frame up to spinning stage by adopting 3 feed per day. This method can be adopted for better cocoon production and for conducting various experiments and maintenance of precious germ plasm.

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