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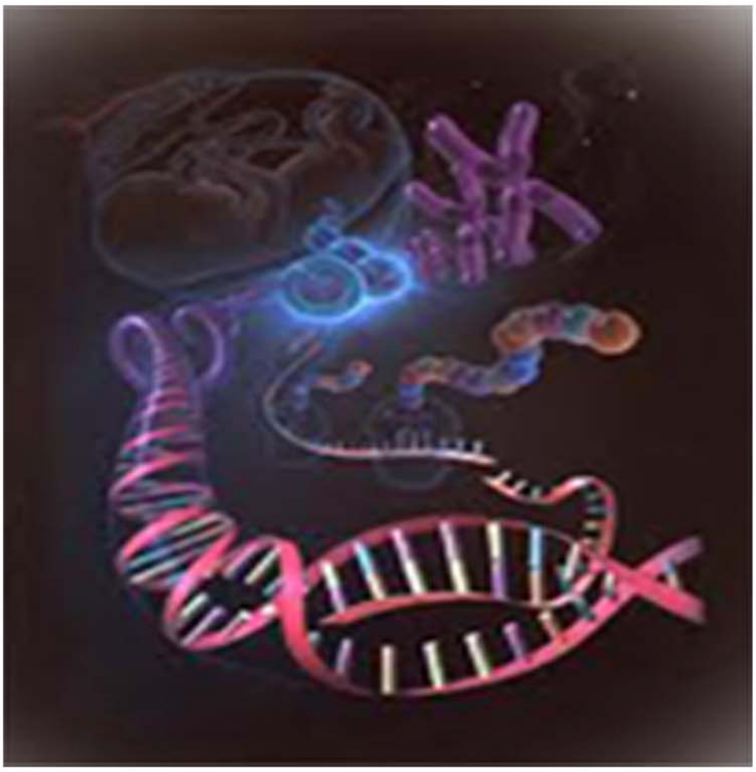

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Research Paper

REARING TECHNOLOGY OF ERI SILKWORM (*SAMIA CYNTHIA RICINI*) UNDER VARIED SEASONAL AND HOST PLANT CONDITIONS IN TAMIL NADU

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The eri silkworm, *Samia cynthia ricini* highly preferring castor as a host plant followed by tapioca and also the suitability of other alternative host has been found out for the continuous rearing during unseason of crop. In laboratory study we were used 10 plant species, viz., *Calotropis gigantean, Nerium odourm, Leucaena leucocephla, Parthenium hysterophororum, Annona squamosa, Pongamia pinnata*, Coconut leaf, banana leaf, *Sesbania grandiflora*, and *Terminalia catapa* for feeding the 5th instar larvae of eri silk worm after pre-starvation period of 30 min. In case of *Calotropis gigantea,* the larvae started feeding initially than stopped in a short period and showed 100% larval death with in an hour. In all other cases except the country almond *Terminalia catapa* and subabul *Leuciana leucocephala,* the worms were not feeding at all, or they just nibbled and started wandering. On the other hand, the feeding was moderate and continuous on subabul and country almond. In another experiment the larval duration on CRNB variety was minimum 23 days and it extent to 25 days in CPDB, CGDB, Co.2-CPDB, Co.2-CGDB, H.165-CPDB. Twenty-six days were required in castor-tapioca combination to complete the larval development and a maximum of 28 days on the tapioca (TV 1&2) host plant. The moulting period for all the larval stages ranged from 3.5 to 4.5 days on different host plants and combinations. It was short in favorable plants.

Keywords: Eri silkworm, Rearing, Season, Host plants, Bed material, Spinning

INTRODUCTION

India enjoys a unique distinction of being the only country in the world producing all the varieties of natural silk, viz., Mulberry, Eri, Tasar, Oak tasar, and Muga. Among these commercially exploited silkworms, eri silkworm is completely domesticated multi voltine, poly-phagous species under non-mulberry sector which is reared through out the year. Neelu Nangia *et al.* (2000) reported the host plant preference of eri silkworm in the order

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of merit, viz., castor > tapioca > papaya > barkesseru > gulancha. Castor and tapioca are the two most important host plants for eri silkworm though there are certain perennial tree species like *kesseru* and *payam* in north east states may serve to provide supplementary food in the off season. Kumar *et al*. (1993) reported that leaves of *kesseru* were next to the castor leaves in terms of cocoon harvest and other economic parameters in south India, the match wood tree species, *Ailanthus excelsa* is common in the plains and hills is also a alternative host for eri silkworm. Sachan and Bajpai (1973a) observed superior larval growth, development and higher cocoon production when eri silkworms were fed with leaves of Rosy castor variety followed by S-30, EB-31 and EB-16 varieties. Papaya plantation is also coming up on a large scale in many parts of South India and the leaves can be used productively. The progressive growth of eri silkworm was superior when fed on castor. Further, the larvae receiving the castor leaves during fifth instar had better growth irrespective of the diet used earlier, i.e., whether tapioca/castor (Joshi, 1987).

The eri silkworm culture adaptation is being practiced in a large scale on the leaves of castor and tapioca. Castor and tapioca is grown on large scale in Salem, Dharmapuri, Nammmakal, Erode and Coimbatore districts of Tamil Nadu where could be practiced successfully and adapted ericulture under these climatic conditions. Growing the castor and tapioca as commercial crop and ericulture would increase the net income to the farmers. The ideal feeding is to administer nourishment to all the worms simultaneously and thereby to secure uniform growth and development of the worms. The feeding must be in harmony with the eating habit and appetite of larvae and must be done economically. Next to feeding, cleaning is an equally important factor. It is necessary for the health and progress of the worms. The pilling of litter makes beds moist became favoring for multiplication of pathogenic microorganisms affects the health of worms and culture. Considering all these factors the ideal bed material, spacing, feeding and cleaning intervals, mountage materials and season were studied.

MATERIALS AND METHODS

Due to the voracious feeding habit of the fifth stage larvae, there is a need to identify alternative host plants for continuous rearing, in case there is a shortage of castor/tapioca leaves. A study was conducted to test the suitability of the following plant species (Table 1) to fifth instar larvae of eri silkworm, after pre-starvation period of 30 min. For each treatment fifty larvae were used. Further, the varieties of preferred host plant and method of rearing and their impact on rearing parameters was studied as per method given below. Same size of the platform (6 x 2 ft.) was used for all the treatments with a larval population of 50 per sq. ft. All the developmental parameters were observed on 50 larvae per replication in three places selected at random on each bed.

T1 Bed method of rearing on double bloom green castor

T2 Bunch method of rearing on double bloom green castor

T3 Bed + Bunch method of rearing on double bloom green castor

T4 Bed method of rearing on Kumkum Rose variety

T5 Bunch method of rearing on Kumkum Rose variety

T6 Bed + bunch method of rearing on Kumkum

Rose variety

T7 Bed method of rearing on Burma White variety

T8 Bunch method of rearing on Burma White variety

T9 Bed + bunch method of rearing on Burma White variety

T10 Floor rearing on Kumkum Rose variety

T11 Tray rearing on Kumkum Rose variety

Considering the need for low cost technology, the following types of bed materials (locally available low cost or waste materials) used for preparing rearing bed and compared their suitability for eri culture using local castor and tapioca varieties:

T1 Gunny bag (GB) + Newspaper (NP),

T2 Urea bag (UB) + Newspaper (NP),

T3 Newspaper alone (NP),

T4 Coconut leaf mat (CL) + Newspaper (NP).

At the fifth instar stage larvae were fed four times per day and beds cleaned daily. The platform size was 6 x 2 ft for all the treatments. Based on the area occupied by the last stage eri worm, the approximate larval population per sq. ft. was fixed at about 50 in the bed method of rearing. With a view to optimize the space and maximize productivity, two higher levels of larval population were tested in comparison with 50 larvae per sq. ft. The study was conducted in a farmer's rearing house with the following treatments:

T1 50 worms per square foot

T2 60 worms per square foot

T3 70 worms per square foot.

Growth and development of eri silkworm depending on the availability food or the frequency of feeding, the following experiments were conducted to find out the interval of feeding using castor Pink Double Bloom Variety in the fifth instar larvae.

T1 3 times feeding per day

T2 4 times feeding per day

T3 5 times feeding per day

During the course of experiment the larvae were fed with more number of leaves for three times feeding per day at the time of feeding compared to four and five times per day and bed cleaned regularly for all the treatments. In another experiment, the pilling of litter makes beds moist became favoring for multiplication of pathogenic microorganisms affects the health of worms and culture. In this regard an experiment was conducted for schedule of cleaning with the following treatments during fifth instar.

T1 Regular bed cleaning

T2 Cleaning once in two days

T3 Cleaning once in three days

T4 Cleaning once in fifth instar at 6th day

During the larval period worms were fed four times per day and bed cleaned according to the interval period. Same size of the platform (6 x 2 ft.) was used for all these experiments.

In order to study the spinning ability and quality of cocoon of eri silkworm on different locally available mountage materials were tried as follows:

T1 Rotary mountage

T2 Dried Sapota leaves

T3 Dried Coconut leaves

T4 Green Coconut leaves

T5 Plastic mountage

T6 Dried banana leaves

T7 Dried sugarcane leaves

T8 Dried palm leaf

T9 Dried sugarcane sheath

T10 Dried guava leaves

T11 Dried mango leaves

The ripened worms were collected from the rearing bed and allowed for spinning on the materials mentioned above. Hundred worms were introduced in each treatment at the rate of 40 worms/sq. ft. and three replications were maintained. The farmers' participatory experiment was done for ideal season/climate on 20 batches of rearing of farmer's crop during the period of September 2003 – January 2005.

RESULTS AND DISCUSSION

Feeding response of *S. cynthia ricini* was poor in the following host plants *Thespesia populnea*, *Antigonon leptopus*, *Erythrina indica*, *Vitex negundo*, *Ipomea carnea*, *Albezia lebbeck*, *Calotropis gigantea* and the mortality rate was high in *Azadirachta indica*, *Jatropha glandulifera*. Low mortality and moderate feeding was observed in the case of *Glyricidia maculate* and *Carica papaya*. *Terminalia catapa* recorded as alternative host plant for matured worms and worms were shown good feeding and no mortality was observed (Table 1).

In the case of *Calotropis gigantea*, the larvae started feeding immediately when fed but stopped within short period and resulted in 100% larval death within an hour. In all other cases the larvae were not shown any growth and the larval stage exist for long time, except in country almond

Table 1: Suitability of Host Plants for Eri Silkworm

Plant Tested	Feeding Response	Remarks
Albezia lebbeck	No feeding	High mortality
Antigonon leptopus	No feeding	High mortality
Azadirachta indica	Slight feeding	High mortality
Coffea robusta	Nibbling/Low feeding	High mortality
Coffea Arabica	Nibbling/Low feeding	High mortality
Calotropis gigantea	No feeding	High mortality
Carica papaya	Moderate feeding	Low mortality
Erythrina indica	No feeding	High mortality
Glyricidia maculata	Moderate feeding	Low mortality
Ipomea carnea	No feeding	High mortality
Jatropha glandulifera	Moderate feeding	Low mortality
Terminalia catapa	Good feeding	No mortality
Thespesia populnea	No feeding	High mortality
Vitex negundo	No feeding	High mortality

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(*Terminalia catapa*) and subabul (*Leucaeana leucocephala*) the worms were fed moderate and continued the rearing. Earlier reports mentioned that there was no significant difference between champa (*Plumeria acutifolia* [*P. rubra*]) and cassava, whereas *S. c. ricini* was unable to survive beyond the 1st instar on sweet potato or papayas (Huq *et al*., 1991). Tender leaves were chosen for the chawkie rearing in case of castor, tapioca and country almond. On contrast *Ailanthus, Jatropha,* and papaya gave 100% mortality at chawkie stage, when the same host plants were tried in the 5th instar the survival percentage was very poor. Among the different host plants the castor and tapioca gave better performance in respective with larval weight, cocoon weight and ERR. Govindan *et al.* (2002) also observed that eri silkworms fed on DCH-177 recorded significantly higher larval weight, larval survival, effective rate of rearing, cocoon weight, shell weight, shell ratio, silk productivity, pupal weight, and rate of pupation, eclosion, fecundity and egg hatching with lower larval and pupal durations than those fed on local pink and raised under farmers' practices. Apart from the above plants, diseased tapioca leaves infected with mosaic virus were also tried for feeding the fifth stage larvae of eri silkworm after a pre-starvation period of 30 min. The larvae fed normally on the mosaic-infected leaves and there was no adverse effect on the eri silkworm.

Larval Development

The larval duration of Eri silkworm on different

Table 2: Stage-wise Larval Duration of Eri Silkworm on Different Host Plants

Instar Host Plant	I Instar (days)	II Instar (days)	III Instar (days)	IV Instar (days)	V Instar (days)	Moulting Duration (days)	Feeding Duration (days)	Larval Duration (days)
CPDB	3.5	4.0	3.5	5.0	6.5	2.5	20.0	22.5
CGDB	3.5	4.0	3.5	5.0	7.0	2.5	20.5	23.0
TV 1	4.0	4.5	4.0	5.0	7.5	3.0	22.0	25.0
TV 2	4.0	4.5	4.0	5.0	7.5	3.0	24.0	25.0
CPDB – TV 1	3.5	4.0	4.0	5.0	7.0	3.0	22.0	23.5
CPDB – TV 2	3.5	4.0	4.0	5.0	7.0	3.0	22.0	23.5
CGDB – TV 1	3.5	4.0	4.0	5.0	7.0	3.0	22.0	23.5
CGDB – TV 2	3.5	4.0	4.0	5.0	7.0	3.0	22.0	23.5
TV 1 – CPDB	4.0	4.5	3.5	5.0	7.0	3.0	22.0	24.0
TV 1 – CGDB	4.0	4.5	3.5	5.0	7.0	3.0	22.0	24.0
TV 2 – CPDB	4.0	4.5	3.5	5.0	7.0	3.0	22.0	24.0
TV 2 – CGDB	4.0	4.5	3.5	5.0	7.0	3.0	22.0	24.0
CNBR	3.5	4.0	3.5	4.5	6.5	2.5	19.5	22.0
CNBG	3.5	4.0	4.0	5.0	6.5	2.5	22.5	23.0

Note: First mentioned variety was used for up to II instars and second variety for later stages.

host plants revealed that 22-23 days in CRNB, CPDB and CGDB; 23-24 days were required in castor – tapioca combinations to complete the larval development and a maximum of 25 days on the tapioca host plant (Table 2).

Depending upon the host plant the larval duration was prolonged. The moulting period for all larval stages ranged from 2.5 to 3.0 days on different host plants and combinations. It was short in favorable plants. Previously Dookia in 1980 reported that eri silkworm reared on Rosy castor variety recorded maximum mature larval weight (7.904 g), cocoon weight (3.683 g), pupal weight (3.256 g) and shell weight (0.426 g), while shell ratio was more on EB-31 variety (13.31%). In our study results indicating that the maximum larval weight (7.6 g) has been obtained in bed + bunch method of rearing on double bloom green castor, cocoon weight (2.96 g) in bed method of rearing on Kumkum Rose variety, effective rate of rearing (90.0%) in bunch method of rearing on double bloom green castor, shell weight (0.44g) and silk ratio (14.9 g) in bed method of rearing on Kumkum Rose variety (Table 3). Reddy *et al*. (1989b) recorded higher survival rate (95.67%), maximum growth index (2.06), higher shell ratio (12.20%), higher net reproductive rate (503.52) and shorter developmental period (46.49 days) when eri silkworms were reared on castor. Devaiah *et al*. (1985) reported that castor is the best host plant affecting the larval weight, silk gland weight, cocoon weight and shell weight considerably.

The observation on different host plants and methods of rearing experiment indicated that the bunch and bunch + bed methods of castor were caused less mortality, unequal and greater ERR compared to other methods and these are statistically significant. Though these bunch method either for castor or tapioca were consuming more time and labor providing more space and good aeration which resulting in less mortality and unequal larvae and maximum ERR

Table 3: Ideal Methods Rearing and Varieties of Host Plants for Eri Silkworm

Treatment	Matured Larval Wt. (g)	3 Days Old Cocoon Wt. (g)	Shell Wt. (g)	Silk Ratio (%)	ERR (%)
T1	7.2	2.62	0.35	13.48	82.70
T2	6.8	2.48	0.32	12.94	90.00
T3	7.6	2.76	0.40	14.13	88.30
T4	7.5	2.96	0.44	14.90	84.00
T5	6.7	2.85	0.42	14.70	82.00
T6	6.9	2.93	0.43	14.70	83.00
T7	6.2	2.85	0.39	13.70	75.00
T8	6.4	2.69	0.37	13.70	77.00
T9	6.0	2.57	0.35	13.60	76.00
T10	6.6	2.88	0.41	14.20	83.00
T11	6.2	2.95	0.43	14.60	84.00
F-value	10.60	11.70	9.80	10.60	5.79

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(Table 3).

The cocoon characters also providing supportive evidence for bunch and bet type of rearing, also statistically significant compared to other types of rearing. Among the tapioca Kumkum Rose variety has been enhanced the growth of larvae in terms of weight, spinning potential, cocoon weight, shell weight, silk ratio and ERR compared to other varieties is irrespective of method of rearing (Table 3). On each variety, all methods of rearing were statistically on par for many rearing parameters. Sannappa *et al.* (1999) reported that three breeds of *Samia cynthia ricini*, White-Plain, Blue-Plain and White-Zebra, were reared on 6 castor [*Ricinus communis*] genotypes, Aruna, RC-8, DCS-72, Local, SL-1 and PCS-121. Data on larval duration and mature larval weight were correlated with larval survival, effective rate of rearing, cocoon weight, pupal weight, shell weight, shell ratio, adult emergence, fecundity and hatchability. He was concluded that increased larval duration and mature larval weight have an influence on rearing performance and cocoon and grainage parameters.

Among the different types of bed materials used in this experiment, coconut leaf mat with newspaper and gunny bag with newspaper were better and statistically significant compared to other types of bed materials taking into account of lower number of unequal larvae, mortality per square foot and number of flimsy cocoons and maximum larval weight, silk ratio and ERR (Table 4). However, the cocoon weight was not statistically significant among the treatments. Spacing experiment revealed that T1- 50 larvae/sq. ft. was statistically superior in terms of minimum larval mortality, minimum number of unequal larvae, maximum larval weight, highest ERR%, higher cocoon weight and maximum silk ratio% (Table 5). Also, this experiment indicated that when the larval populations were increased per square foot, the rearing parameters observed

Table 4: Suitability of Low Cost Materials for Eri Silkworm Rearing

Treatments	5th day 5th Instar wt. (g)	Larval Mortality (%)	Unequal Larvae/sq. ft. (%)	Good Cocoons (%)	Flimsy Cocoons	Cocoon Weight (g)	ERR (%)	Silk Ratio (%)
T1. GB + NP	6.23	2.25a	3.50a	79.60b	20.40b	2.31a	84.80c	13.43c
T2. CL + NP	6.40	1.00a	2.30a	85.80c	14.20a	2.51ab	90.95d	14.19d
T3. NP	6.20	3.70ab	4.33a	75.40b	24.60b	2.28a	77.05b	12.18b
T4. UB + NP	5.90	9.00c	9.30b	65.70a	34.30c	2.17a	71.70a	11.69a

Table 5: Impact of Population Density on Rearing Parameters of Eri Silkworm

Treatments	5th day 5th Instar Wt. (g)	Larval Mortality (%)	Unequal Larvae/sq. ft. (%)	Good Cocoons (%)	Flimsy Cocoons	Cocoon Weight (g)	ERR (%)	Silk Ratio (%)
T1	7.27c	0.67a	2.00a	88.9c	95.2c	6.2a	2.65b	13.57b
T2	6.73b	2.33b	4.33b	81.6b	87.4b	5.8a	2.23a	13.44b
T3	6.00a	4.00c	8.00c	67.6a	76.3a	8.7b	2.04a	12.53a

were below optimum. Haque and Hossain (1991) reported that the highest density desirable for eri silkworm was found to be 150 larvae/tray (0.9 x 6 m^2) were reared on castor and cassava in the laboratory at 27 °C and 80% RH, at 50-275 larvae/ tray.

The frequency of feeding studies revealed that when larvae were fed for 3 times per day more number of unequal larvae, higher rate of flimsy cocoons and lower ERR was observed compared to 4 and 5 times feeding per day (Table 6). The cocoon characters indicated that the cocoon weight and silk ratio were more or less similar in other treatments. However, the cocoon weight, ERR % and SR % were not greatly influenced by the frequency of feeding (Table 6). The study indicates that the number of feeding is not having much influence if sufficient food provided during three times feeding per day. Huq *et al.* (1991) reported that the optimum number of feeds was 4/day at intervals of 6 h.

The bed cleaning experiment in farmers' field reveled that regular bed cleaning every day minimizes the larval mortality (0.67%). It was higher in T3 and T4 treatments (2.0-3.67%). Good cocoons were lower and flimsy cocoons higher in T4. Silk ratio was also lower in T4 (cleaning once during V instar). However, the ERR % was non-significant (Table 7). All the mountage materials selected in this study showed 100% spinning. After fifth day the cocoon was harvested from each mountage materials separately for studying the cocoon characters like cocoon weight, length and breadth; shell weight and silk ratio. This study revealed that the worms allowed to spin on the green coconut material was recorded statistically significant highest cocoon weight (2.67 g) followed by rotary mountage, dried

Table 6: Suitable Feeding Schedule for Eri Silkworm Rearing

Treatments	5th day 5th Instar Wt. (g)	Unequal Larvae/sq. ft. (%)	Good Cocoons Cocoons (%)	Flimsy Cocoons Cocoon	Cocoon Weight (g)	ERR (%)	Silk Ratio (%)
T1	5.90a	4.00b	90.5a	89.4a	9.5b	2.44a	12.13a
T2	6.57b	2.67a	97.0b	96.6b	3.0a	2.68b	14.23c
T3	6.87b	3.00a	96.0b	95.7b	4.0a	2.65b	13.88b

Note: Similar alphabets in the column are statistically not significant.

Table 7: Bed Cleaning Schedule in Ericulture

Treatments	5th day 5th Instar Wt. (g)	Larval Mortality (%)	Unequal Larvae/sq. ft. (%)	Good Cocoons Cocoons(%)	Flimsy Cocoons Cocoon	Naked Pupae (%)	Cocoon Weight (g)	ERR (%)	Silk Ratio (%)
T1	6.80	2.20	11.65	80.20b	19.80 a	90.10b	1.90	2.43	13.42
T2	6.40	4.37	11.20	79.00b	21.00a	87.45ab	2.1 0	2.27	12.79
T3	6.30	6.05	12.80	71.93a	28.07b	83.70a	1.30	2.17	13.30
T4	6.30	6.88	15.40	69.78a	30.22b	79.45a	4.30	2.09	12.40

mango, coconut, sapota and banana leaves (2.53 -2.46 g). The worms allowed to spinning on the plastic mountage, sugarcane leaf and sheath, palm leaf, guava leaves were recorded lowest cocoon weight (2.38-2.25 g) compared to other materials used.

Mountages

The mountage materials have influence on the shell weight of eri silkworm, the present study revealed that the worms allowed to spin on the banana, rotary, green coconut, mango leaves and plastic mountage were recorded statistically significant maximum shell weight (0.35-0.33 g) compared to the dried coconut, sapota, sugar-cane leaf and sheath, palm and guava leaves (0.32-0.30 g). But, the silk ratio of the cocoons obtained from the different mountage materials were used in this study showed statistically not significant and it was ranged from 12.87 to 13.97% (Table 8). The length of the cocoon was maximum in worms allowed to spin on the banana, sapota, coconut, guava and mango leaves ranged from 6.1 to 5.82 cm and this was minimum when worms allowed spinning on rotary mountage. The breadth of cocoon was ranged from 2.09 to 2.58 cm and it was maximum in worms spin on sapota and minimum on palm leaf. The correlation stu-dies revealed that the shell weight proportionally increased with cocoon weight and it has signi-ficant positive correlation with the silk ratio. The shell weight and silk ratio are having significant positive correlation with cocoon breadth and non significant negative correlation with cocoon length.

The available information for 20 batches of rearing was pooled and correlated. The summary of the results is given below. The mean maximum temperature during the study period of September 2003 to January 2005 was in the range of 26.0 to 37.2 °C in the plains and hills of four districts in Tamil Nadu. The mean minimum temperature in the above period ranged from 19.0 to 27.0°C, and

Table 8: Suitability of Mountage Materials for Eri Culture

Materials	Cocoon weight	Shell weight	SR%	Cocoon Length	CocoonBreadth
Rotary	2.53ab	0.34ab	13.71	4.48a	2.43b
Sapota leaves	2.46a	0.32a	13.17	5.83c	2.58bc
Coconut dried	2.47a	0.32a	12.90	6.00c	2.34b
Coconut green	2.67ab	0.34ab	12.87	5.74bc	2.39b
Plastic	2.36a	0.33a	13.97	5.52b	2.51b
Banana leaves	2.46a	0.35ab	14.33	6.10c	2.51b
Sugarcane leaves	2.38a	0.31a	13.10	5.60b	2.22a
Palm leaf	2.35a	0.31a	13.08	5.48b	2.09a
Sugarcane Sheath	2.25a	0.31a	13.86	5.33b	2.42b
Guava leaves	2.32a	0.30a	13.05	5.83c	2.40b
Mango leaves	2.51ab	0.33a	13.14	5.82c	2.46b
F-value	2.39	2.12	NS	14.07	3.32

Note: Similar alphabets in the column are statistically not significant.

the relative humidity was 49 to 78%. Eri silkworm rearing could be done in the above range of temperature and humidity of these selected reference area in Tamil Nadu. The mean larval period during the above mentioned period was ranging from 19 to 24 days and the silk ratio was 11.4 to 16.8 % (Table 9a). The worms have to be fed for an extra of 5 days on an average. That means the rearing schedule and quantity of leaf required will be having a great influence on eri culture. Again, the additional food ingested should result in increased silk in the cocoon to commensurate the time and material needed additionally. With this in view, correlations were made on the influence of key weather factors on silkworm larval period and the resultant SR percent.

There was a negative significant correlation between the mean maximum temperature or mean minimum temperature of the rearing period on the one hand and larval period of the eri silk-worm on the other during the rearing in 20 batches between September 2003 and January 2005. The correlation between maximum/ minimum temperature and silk ratio was not significant

Table 9a: Influence of Weather Factors on Larval Period and Silk Ratio

Batches/Months	Mean Max.Temp. °C	Mean Mini.Temp. °C	RH %	Larvalperiod	ERR(%)	Silk Ratio%
I. 9-10/03	31.0	27.0	73.0	19	80.2	14.80
II. 11-12/03	30.5	24.0	73.5	25	83.9	15.90
III. 12/03-1/04	29.5	19.5	72.5	21	73.7	13.00
IV. 1-2/04	30.5	22.0	73.8	21	82.6	14.58
V. 2-3/04	32.9	21.5	61.1	21	76.3	15.79
VI. 4-5/04	37.2	26.7	60.8	20	87.1	11.75
VII. 5-6/04	35.1	26.4	58.6	19	58.4	14.68
VIII. 5-6/04	36.9	27.4	60.8	20	57.3	15.23
IX. 6-7/04	34.2	25.4	59.7	20	58.7	11.40
X. 7/2004	26.0	22.0	78.0	23	68.3	15.80
XI. 7-8/04	35.9	26.3	58.6	20	71.7	12.47
XII. 8/2004	33.1	23.1	59.6	22	85.1	14.20
XIII. 8-9/04	36.3	26.9	67.7	19	80.0	13.09
XIV. 9/2004	32.9	22.4	66.2	22	78.8	15.60
XV. 9-10/04	32.9	24.0	65.7	23	76.3	16.80
XVI. 10/2004	30.5	24.6	65.6	23	80.7	16.10
XVII. 11/2004	29.1	24.0	73.0	23	84.3	15.90
XVIII. 11-12/04	31.0	24.0	72.5	23	93.2	15.70
XIX. 12/2004	30.0	19.0	55.1	24	86.0	15.90
XX. 1/2005	31.0	25.5	49.0	22	75.2	15.60

Table 9b: Correlation Between Weather and Rearing Parameters

Parameters	Larval period	SR%	ERR (%)
Maximum Temp.	-0.651**	0.184 NS	-0.269 NS
Minimum Temp.	-0.559*	-0.303 NS	-0.337 NS
RH %	0.206 NS	-0.533*	0.233 NS
Larval period		0.654**	0.526*

Note: n = 18; P (0.05) = 0.399; P (0.01) = 0.564

(Table 9b). This indicates that lower the temperature during the rearing period longer is the larval period requiring more leaves for feeding. The correlation between larval period and silk ratio percent was positive and significant. As the larvae feed for more number of days the silk content in the cocoon also increased proportionately. Hence, during the cooler months the larvae feed for a longer time and produce more silk.

Neupane *et al.* (1990) reported that *Samia cynthia ricini* had 6 generations annually on castor (*Ricinus communis*) in the laboratory. The life cycle took 38-50 days during March-September, 49-61 days during September-November and 114-126 days during November-April. The mean weights of mature larvae, cocoons, pupae and shells were 5.24, 3.75, 3.09 and 0.61g, respectively, during July-August. Similar results were obtained using cassava as the food plant, but the weights of larvae, cocoons, pupae and shells were slightly lower. Sannappa *et al.* (1999) reported that the larval duration and mature larval weight were correlated with larval survival, effective rate of rearing, cocoon weight, pupal weight, shell weight, shell ratio, adult emergence, fecundity and hatchability. He was concluded that increased larval duration and mature larval weight have an influence on rearing performance and cocoon and grainage parameters.

CONCLUSION

Reference to this experiment we are concluding that the ericulture practice could be implemented in Southern region of India. This experimental report is providing valuable guidelines and economical strategies to the ericulture farmers.

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