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Acceleration of Mounting in Self Mounting Method and Its Effect on Cocooning, Cocoon Characters and Reeling Parameters in Silkworm *Bombyx mori* L.

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Rotary mountages are the best mountages among all the mountages that are used in sericultural areas. But to use this mountage more space, separate mounting hall & requires more labour to pickup the matured worms. To over come these problems, self mounting method is adopted to save the time & labour. But the mounting rate is generally less. To accelerate the mounting rate different repellents viz; saw dust, phytoecdysone, 1% cresol with paddy husk, lime, kaolin, formalin chaff were used in the present study. The results indicated that highest number of larvae climbed the mountage in 1% cresol with paddy husk, followed by phytoecdysone and lime. It is observed that the use of repellents at wandering stage accelerates mounting rate and did not affect the quality of the cocoons and reeling characters.

Key words : Rotary mountage, Acceleration, Mounting, Repellents

Introduction

The quality and quantity of silk produced are highly related to the care taken during rearing, types of mountages used during spinning and mounting conditions (Singh and Kamble, 1997; Dar *et al.*, 1989; Barah and Samson, 1990). Among the mountages that are in use in different sericultural areas, rotary mountages of Japan are proved to be the best because cocoons are uniform in shape and size, minimum defective cocoons, higher reelability and cocoons fetches 15 - 20% higher price compared to bamboo chandrikae (Katsumata, 1975; Himantharaj *et al.*, 1995; Rajan *et al.*, 2000). But, to use rotary mountages, more space and separate mounting hall are required. For mounting of silkworms different methods are followed. Among them self mounting or natural mounting method is time and labour saving method, but the mounting rate is generally low (Kamimura *et al.*, 1996, 1998). Various repellents like saw dust (Rajan *et al.*, 2000) Cresol with paddy husk (Rajan *et al*, 1996), saw dust of hinoki cypress, red pine (Ashida, 1936; Kitazawa, 1940) were used to accelerate the mounting process. Keeping this in view, the present study was undertaken to accelerate the mounting by using different repellents, to reduce the labour for mounting by adopting self mounting using the rotary mountage with minimum space.

Materials and Methods

Mass shoot rearing was conducted by using CSR2 x CSR5 bivoltine hybrid till spinning. At the time of spinning larvae were grouped in to seven groups. For each group, three replications and for each replication 1,500 larvae were kept. When the larvae were ready for spinning the following treatments were imposed: T1, Saw dust @ 2 kg./1500 larvae; T2, Crude extract of phytoecdysone 150 ml/1,500 larvae (150 ml of crude extract of phytoecdysone sprayed on 1.5 kg of mulberry leaf); T3, 1% Cresol with paddy husk (1 kg of paddy husk with 1 liter of 1% cresol); T4, Lime (30 gm./sq. feet rearing bed area); T5, Kaolin (30 gm./sq. feet rearing bed area); T6, 1 kg Formalin chaff for 1500 larvae (10 parts of charred paddy husk is mixed with 1 part of 0.8% Formalin).

Two rotary cardboard mountage frames were tied with a

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wooden reaper in such a way that two mountage frame remain adjacent to each other. After imposing the treatments, 5 no's tied mountages per replication were placed on the rearing bed itself . Similarly, control batch was also maintained to compare the results where in no repellents were applied. After mounting the silkworms, number of larvae climbed on the rotary mountages were recorded after every 6 hours interval up to 30 hours. In mounting hall optimum temperature (24 - 25°C), relative humidity (65 - 70%) and good ventilation were provided. After 6 days cocoons were harvested, sorted out, counted, number of good cocoons formed in the mountage, floss % was recorded. Observations were made for single cocoon wt, single shell wt, shell ratio, filament length, non-breakable filament length, denier, renditta, reelability and raw silk percentage. The experiment was repeated thrice and data were subjected for analysis of variance. Results were presented in Tables and Figures.

Results

The number of larvae climbed on the mountage was recorded at every 6 hrs interval. Highest number of larvae climbed in T3 batch (738 nos.) and lowest was found in control batch (425). Similarly, in 12 hrs, 18 hrs, 24 hrs and 30 hrs the highest number of larvae climbed in T2 and T4 batch (979,1133,1188,1196 respectively). Whereas, the lowest number of larvae were observed in control batch after 12 hrs, 18 hrs, 24 hrs and 30 hrs (546, 724, 724 and 961 nos. respectively) after placing the mountages on the rearing bed (Fig. 1).

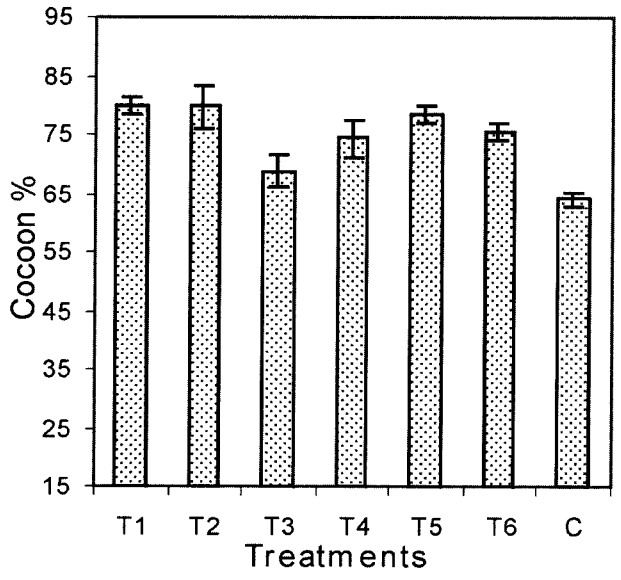

Fig. 1. Percentage of cocoons in mountage.

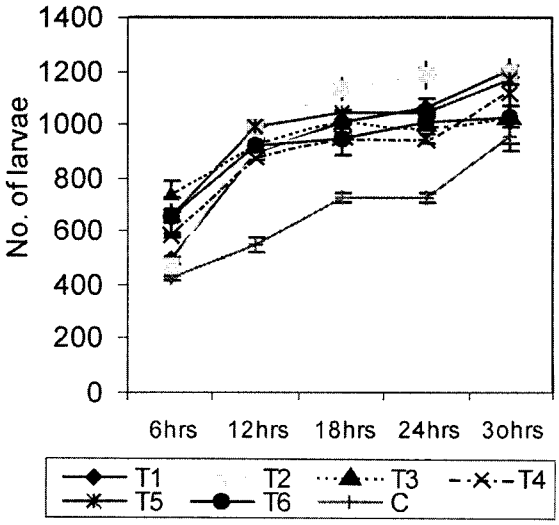

Fig. 2. Number of larvae climbed on the mountage after treatment of repellents.

The highest percentage of cocoon formed in T1 (80.0%) and lowest was in control batch (64.1%). The result indicated that there was highly significant difference between the treatments (Fig. 2). The data revealed that significant difference was observed among the treatments. Highest number of good cocoons were observed in T2 (1165) and lowest value was recorded in the control batch (928).

The highest floss percentage was observed in both T2 and control batch (1.10%) and lowest was observed in T3 (1.04%). However, there was no significant difference between the treatments. The data reveals that non significant difference was observed among the treatments. T2 showed highest single cocoon wt. (1.59 g) where as T5 showed lowest value (1.49 g). The highest single shell wt. was observed in T6 (0.370 g) and lowest was observed in both T1 and T5 (0.347 g).However, there was no significant difference between the treatments for both the traits compared to control. Highest cocoon shell ratio was observed in T6 (23.57%) and lowest was recorded in T2 (22.20%). No significant difference was observed between the treatments.

Highest average filament length was recorded in control batch (1025 m) and lowest was recorded in T1 (962 m). The highest and lowest non breakable filament length was observed in T2 and T3 (862 m and 741 m respectively). Denier showed marginal improvement in T2, T5 and T6 batch. (2.71, 2.65, 2.75 respectively) when compared with the control batch (2.47). The higher denier was observed in T2 (2.71) batch and lower denier was observed in T1 (2.39) batch. The result indicated that there was marginal improvement in renditta .The highest renditta was observed in T1 (6.13) and lowest result was

Table 1. Evaluation of silkworm mounting on self mounting and its effect on cocoon characters

Treatment	Good Cocoon in mountages (Nos)	Floss (%)	Single shell wt (g)	Single cocoon wt (g)	S.R.(%)
(T1) Saw dust	1151	1.04	1.51	0.347	22.98
(T2) Phytoecdysone	1165	1.10	1.59	0.353	22.20
(T3) Cresol with paddy husk	983	1.04	1.56	0.350	22.44
(T4) Lime	1083	1.05	1.54	0.350	22.73
(T5) Kaolin	1112	1.13	1.49	0.347	23.29
Formalin chaff	1109	1.06	1.57	0.370	23.57
Control	928	1.10	1.58	0.367	23.23
Test of significance	**	NS	NS	NS	NS
C.D. at 5%	97	-	-	-	-

NS = Non-significant ** = Highly significant

Table 2. Evaluation of silkworm mounting on self mounting and its effect on reeling parameters

Treatment	Av. Filament Length (m)	NBFL (m)	Denier	Renditta	RS(%)	RSR(%)	Reelability(%)
(T1) Saw dust	962	820	2.39	6.13	16.36	73.60	83.02
(T2) Phytoecdysone	983	862	2.71	5.94	16.86	81.13	88.13
(T3) Cresol with paddy husk	966	741	2.46	6.12	16.50	72.52	83.42
(T4) Lime	1010	840	2.45	5.92	16.67	75.15	87.45
(T5) Kaolin	990	774	2.65	6.09	16.76	69.85	85.73
(T6) Formalin chaff	1005	842	2.75	5.91	16.30	78.37	84.04
Control	1025	856	2.47	5.90	16.71	76.26	86.07
Test of significance	NS	NS	NS	NS	NS	NS	NS

NS = Non-significant

recorded in control batch (5.90).The highest raw silk percentage was found in T5 (16.76%) and lowest was observed in T6 (16.30%). Raw silk recovery percentage was highest in T2 (81.13%) and lowest in T5 (69.85%) was observed. However, marginal improvement was observed in T2 and T6 (78.37%) batches when compared to control (76.26%). Highest reelability percentage was observed in T2 (88.13%) and lowest value was recorded in T1 (83.02%). However, non-significant difference was observed between the treatments in all the reeling parameters (Table 2).

Discussion

The data clearly indicated that in phytoecdysone treated batch 79.7% of larvae climbed and formed the cocoon in the mountage as compared to control batch (64.1%). This is due to acceleration of maturation by phytoecdysone. This observation is in conformity with the studies of Ninagi and Maruyama (1996), Himantharaj (1996) and Maribashetty *et al.* (1997). In sawdust applied batch, the matured larvae mounted on the mountage in much shorter period than the control batch. This must be caused by the repellent compounds contained in the sawdust. This is in conformity with the studies of Mizuta and Kuwano (1969 a,b) who observed that hinoki saw dust had a repellent effect against the wandering larvae. Rajan *et al.* (2000) also observed that sprinkling of sawdust in wandering stage accelerated the mounting process without affecting the cocoon and reeling parameters. Use of lime and formalin chaff also showed that more number of cocoons formed in the mountage, than in the control batch. The pungent smell may accelerate the mounting process.

Further, the data of this study also clearly indicated that the use of repellents did not affect the quality of the cocoons and reeling parameters. The result of the present study is also in conformity with the findings of Rajan *et al.* (2000). It could be concluded that by use of repellents at wandering stage, accelerate the mounting process with out affecting the cocoon and reeling parameters. In addition, by employing self mounting in rotary mountage considerable amount of time and labour can be saved with out any compromise in cocoon quality.

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