

EFFECT OF BED DISINFECTANTS AND SEASONAL INCIDENCE OF SILKWORM DISEASES IN STONE AND RCC REARING HOUSES

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ABSTRACT

Silkworm diseases are the major problem in Sericulture, prevention of these diseases is one of the most important aspects in the success of commercial silkworm rearing. In order to obtain, high and stable cocoon yield it is necessary to decrease the pathogen load in the rearing environment. The most commonly used bed disinfectants by the farmers are viz., Active lime(4 kg), Vijetha(2-3 kg) and Ankush (3.5-4 kg). The variation was noticed with type of silkworm rearing house and cocoon yield. Further, in the medium stone house category (6 farmers) (40 × 20-50 × 30 ft) 5 to 15 per cent disease incidence was noticed during summer (5-15 and 5-20 %) compared to rainy (10 % and 1%) in stone house and RCC house respectively. Further cocoon yield of 85 and 95 kg/100 dfls was reported when the farmers applied 2kg Lime and 3 kg Vijetha respectively. The mean data from 4 farmers of medium RCC rearing house revealed that, a range of 0-1 %, 0-10 % and 5-20% disease incidence was recorded in rainy, winter and summer seasons respectively. On contrary cocoon yield of 95kg/100dfl was recorded in case sample number 4 even though the farmer did not applied any bed disinfectants.

INTRODUCTION

Silkworm is sensitive to varied climatic conditions which are affected by bacterial, viral, muscardine and protozoan pathogens and sometime in combination of different pathogens. Bacterial and viral diseases are major constraints in the progress of the agrobased sericulture industry. The host and pathogen reaction may be due to the genetic constitution of the host, the pathogen and the environment (Suparna *et al.*, 2011).

Nataraju *et al.* (2004) reported that the silkworm crop loss to the tune of 22 to 43 per cent due to flacherie. The management of silkworm diseases is a vital component of successful silkworm rearing for obtaining higher cocoon yield and quality. Use of bed disinfectants, antibiotics and rearing tolerant silkworm breeds help in reducing crop loss due to diseases. The need of the present work is emphasized on the lack of appropriate quantity of bed disinfectants used for disease management. However it is considered as one of the efficient approach in integrated disease management. In this study area different types of bed disinfectants are used by the farmer in different quantities without adopting standard package of practices as per the report when Vijetha used as bed disinfectant (3 kg/100 dfls) after each moult before feeding as well as on fourth day of final instar effectively prevented infection and spread of the diseases during silkworm rearing. It is unique formulation against all silkworm diseases namely pebrine, grasserie, flacherie and muscardine under varied conditions (Datta *et al.*, 1998). The silkworm bed disinfectants, vijetha, Resham jyothi, Resham keet oushadh and slaked lime

were tested at laboratory conditions for their efficacy against grasserie and flacherie in silkworm, *Bombyx mori* L. The study was revealed that, Vijetha and Resham Jyothi are found effective against grasserie as well as flacherie diseases while RKO and slaked lime proved to be good only for grasserie (Zeya *et al.*, 2004). Therefore a study was undertaken to assess their incidence in different rearing houses in zone-5 of Karnataka.

MATERIALS AND METHODS

A survey was undertaken during the months of June to May 2011 to 13 in Chikkaballapur and Kolar districts which were stands first and second position in the production of mulberry raw silk under both rainfed and irrigated conditions respectively. Three villages each from four taluks were selected. The survey was made by selecting atleast fifty sericulturists practicing sericulture.

The villages that are selected from Kolar district are under jurisdiction of KVK, Chintamani. Further, Bethamangala, Ankahatti, Matnahalli and Balegere are under jurisdiction of KVK Kolar. The villages that are selected from Chikkaballapur district are Kurubur, Kyvara and Kathriguppe from Chintamani taluk, Thaladimbanahalli, Devaramalluru from Shidlaghata taluk. The farmers are using different types and quantity of bed disinfectants during their rearing period. The farmers who are not used (0 quantity) bed disinfectants and their effect is reflected on the cocoon yield. The data was collected by using pre-tested structured personal interview schedule and data was pooled and statistically analyzed by using simple CRD.

Name of the farmers having medium stone house with stone roof (40 × 20-50 × 30 ft)

Sl. No.	Name	Name of the village	KVKs/ RSKs	District
1	Manjunath	Ankahatti	Sugaturu	Kolar
2	Ramanjanappa	Matanahalli	Chintamani	Kolar
3	Prasanna Kumar	Balagere	Sugaturu	Kolar
4	Shankarappa	Kywara	Kywara	Kolar
5	Siddappa	Bethamangala	Bethamangala	Kolar
6	Channabasappa	Alur	Kasaba	Chikkaballapur

Name of the farmers having medium RCC house (40 × 25 - 50 × 35 ft)

Sl. n.	Name	Name of the village	KVKs/RSKs	District
1	Prabhakar	Kuruburu	Chintamani Kasaba	Kolar
2	Papanna	Devaramallur	Shidlagatta	Chikkaballapur
3	Naganna	Bodaguru	Shidlagatta	Chikkaballapur
4	Venkataswamy	Chaudasandra	Jangama Kote	Chikkaballapur

RESULTS AND DISCUSSION

In medium, stone house did not yield significant difference in disease incidence during summer season, but significant difference was noticed during rainy and winter seasons. Out of six samples surveyed, only one sample used 3 kg of Vijetha, two samples were used 4 and 2 kgs of lime, one sample was used 3.5 kg of Ankush, 3 kgs of Vijetha + Lime per 100 dfls as bed disinfectants. The type of bed disinfectant used did not show much variation in the cocoon yield as it is noticed in the statistical data. However, maximum of 95 and minimum 70 kg/100 dfls cocoon yield was recorded in sample six and two respectively (Table 1).

In medium RCC house, the sample size was four. As per the statistical data highest percentage of disease incidence was ranged from 5-20 per cent, observed during summer season and cocoon yield is 80-95kg/100dfls. Among the three types of bed disinfectants used, preference was more for Lime and Ankush followed by vijetha @ 4kg/100 dfls. The increased application of bed disinfectants recorded increased yield per 100 dfls. (Table 2).

These results are confirmed by Selvakumar *et al.* (1994) who

conducted the survey on the incidence of silkworm diseases for a period of 4 years (1990-93) in different sericultural areas in Karnataka *viz.*, Attibele, Kunigal (seed area) Ramanagaram and Chamarajanagar (commercial areas). Dandin *et al.* (2000) reported the nuclear polyhedrosis prevails throughout the year and found more during summer and rainy season. It was found highest (7.35, 55.35 and 7.42, 32.97 per cent) during 1984 and 1985 respectively in Karnataka, Nataraju *et al.* (1998). It was also in confirmative with BonthaKasi Reddy and Jemmy Venkata Krishna Rao, (2009) who studied the season wise incidence of silkworm diseases namely grasserie, flacherie and muscardine in Palamaner and Penukonda areas. The diseases *viz.*, flacherie (8.0-10.0 per cent), grasserie (7.0-10.5 per cent) and muscardine (1.5-3.5 per cent) in summer season and whereas in case of 2005-06, flacherie (6.8-8.9 per cent), and grasserie (4.5-8.0 per cent) was noticed more during summer season.

Lime + paraformaldehyde + Benzoic acid (95:3:2) resulted in an overall decrease of 16.5 and 15.4 per cent mortality over control. These two composites were also significantly improved the effective rate of rearing (ERR). Application of Vijetha and Reshamjyothi are found effective against grasserie as well as flacherie diseases while RKO and slaked lime proved to be good only for grasserie (Zeya *et al.*, 2004).

Further, the research findings were strengthening by Laboratory studies on the efficacy of Ankush indicated its high efficacy in preventing the spread of diseases during silkworm rearing. The dusting of Ankush has resulted in the reduction of diseases over inoculated control to an extent of 74.14, 80.56, 96.00 and 69.75% in grasserie, flacherie, muscardine and pebrine respectively. The results clearly indicated that, the disease reduction due to efficacy of Ankush is on par with Vijetha. The data on the field trials of Ankush as bed disinfectant for the prevention of spread of diseases during rearing is presented. The evaluation studies showed that, an average of 60.75 kg cocoons/100 dfls. were harvested in Ankush dusted batches with diseases incidence of 3.072% when compared to 60.07 kg yield/100 dfls. in Vijetha batches (3.304 %) (Balavenkatasubbaiah *et al.*, 2014).

In addition to above, the effect of lime collected in the survey area on the silkworm crop is also emphasized by another laboratory study. Application of lime (3 g/ sq ft) as bed disinfectant + bundh powder after every moult) in first rearing. Revealed 10.04% flacherie and 0.10% muscardine. However,

Table 1: Effect of incidence of disease and type of disinfectants used on cocoon yield of different farmers (Stone house, 40 × 20-50 × 30 ft)

Sl. Number	Seasonal Disease incidence (%)			Type of bed disinfectants				Yield(kg/100 dfls)
	Rainy	Winter	Summer	Vijetha (Kg)	Lime(Kg)	Ankush(Kg)	Vijetha + lime(Kg)	
1	0.00(0.70)	0.00(0.70)	10.00(3.23)	0.00(0.70)	4.00(2.11)	0.00(0.70)	0.00(0.70)	90.00
2	10.00(3.17)	10.00(3.17)	10.00(3.23)	0.00(0.70)	0.00(0.70)	0.00(0.70)	0.00(0.70)	70.00
3	0.00(0.70)	10.00(3.23)	15.00(3.90)	0.00(0.70)	0.00(0.70)	0.00(0.70)	3.00(1.85)	75.00
4	0.00(0.70)	0.00(0.70)	15.00(3.90)	0.00(0.70)	2.00(1.55)	0.00(0.70)	0.00(0.70)	85.00
5	0.00(0.70)	0.00(0.70)	10.00(3.17)	0.00(0.70)	0.00(0.70)	3.50(1.99)	0.00(0.70)	90.00
6	0.00(0.70)	0.00(0.70)	5.00(2.33)	3.00(1.81)	0.00(0.70)	0.00(0.70)	0.00(0.70)	95.00
F-test	**	**	*	**	**	**	**	**
SEm ±	1.18	1.27	1.79	0.47	0.33	0.11	0.23	3.33
C D at 1%	5.09	5.48	7.75	2.03	1.44	0.50	1.01	14.39

**Significant at 1 %, () values in the parenthesis are transformed values of "x + 0.5"

Table 2: Effect of incidence of disease and type of disinfectants used on cocoon yield of different farmers (RCC, 40 × 25-50 × 35 ft)

Sl. Number	Seasonal Disease incidence (%)			Type of bed disinfectants			Yield (Kg/100 dfls)
	Rainy	Winter	Summer	Vijetha (Kg)	Lime (Kg)	Ankush (Kg)	
1	0.00(0.70)	0.00(0.70)	20.00(4.50)	0.00(0.70)	4.00(2.11)	0.00(0.70)	80.00
2	1.00(1.21)	10.00(3.23)	20.00(4.50)	2.00(1.55)	0.00(0.70)	0.00(0.70)	69.00
3	0.00(0.70)	5.00(2.33)	15.00(3.93)	3.00(1.85)	0.00(0.70)	4.00(2.11)	80.00
4	0.00(0.70)	0.00(0.70)	5.00(2.33)	0.00(0.70)	0.00(0.70)	0.00(0.70)	95.00
F-test	**	**	**	**	**	**	**
SEm ±	0.14	0.64	2.08	0.40	0.28	0.29	2.50
C D at 1%	0.68	3.06	9.87	1.93	1.36	1.36	11.86

**Significant at 1 %, () values in the parenthesis are transformed values of $\sqrt{x+0.5}$

in second rearing daily application of hydrated lime powder at the rate of 5 g/ sq ft + bundh powder after every moult recorded (10.05% flacherie and 0.11% muscardine) and maximum disease incidence was noticed in absolute control (22.56% flacherie, 1.75% muscardine and 22.54% flacherie, 1.74% muscardine, respectively) in first and second rearing. Revealing effective control flacherie and muscardine in hydrated lime, active lime in combination with bundh powder (Swathi *et al.*, 2014).

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