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## Field efficacy of bio foliar formulations for control of mulberry sucking pests

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**Abstract**

Utilization of organic formulations in pest management is a cheap, environmentally friendly alternative to chemical pesticides. This study was designed to investigate the effects of organic formulations on sucking pests damage to mulberry leaves. A field experiment was conducted with irrigated V1 mulberry variety, Department of Sericulture, Forest College and Research Institute, Mettupalayam during 2017-2018 which was laid out in Randomized Block Design with five treatments and four replications. The applications of bio foliar formulations were given thrice at 15, 30 and 45 days after pruning using knapsack sprayer and data on pest population was counted weekly for two seasons. Analysis of variance revealed significant differences between the treatment groups at 5% probability level. The results revealed that the minimum damage by different pests viz., *Pseudodendrothrips mori* and *Aleurodicus dispersus* were observed in EM and panchagavya applied plants. Thus, the foliar spray of panchagavya at 3 per cent on 15, 30 and 45 DAP is ideal for magnify the mulberry sucking pests.

**Keywords:** Mulberry, organic formulations, panchagavya and sucking pest

**Introduction**

Mulberry (*Morus sp.*) is a hardy, deep rooted, perennial fast growing deciduous plant which belongs to the family Moraceae. It is the sole food plant for silkworm *Bombyx mori*. L and it has greater economic importance in sericulture industry. Mulberry crop is infested by an array of pests and diseases which cause an economic damage to the crop and ultimately affect silkworm growth and cocoon production. Among various pests and diseases, mulberry crop is severely affected by sucking pests such as mealy bug, thrips, whitefly and defoliators such as leaf webber, hoppers, ash weevil *etc.*, are controlled by chemical method. The application of various chemicals not only increases the cost of leaf productivity but also spoils the soil health status of mulberry garden. There arises the pertinent need to organic fertilizer and organic foliar formulations to prevent the damage of pests and diseases on crop (Pandian *et al.*, 2006)<sup>[5]</sup>. The application of organic foliar formulations on mulberry is a easiest way for supplying essential major nutrients and minor nutrients, plant growth regulatory substances, enzymes, beneficial microbes for quick boost to increasing mulberry leaf productivity, controlling pests and foliar diseases of mulberry and increasing the quality cocoon production. By keeping this view in mind, the present study has been undertaken to know the efficacy of different organic foliar formulations on controlling the sucking pests of mulberry.

**Materials and Methods**

A field experiment was carried out in the well-established mulberry garden with V1 variety (2 years old) in the 'J' Block, Department of Sericulture, Forest College and Research Institute, Tamil Nadu Agricultural University, Mettupalayam was selected for conducting the experiments. The experiment was repeated twice in 2 years old well-established mulberry garden. The experiment site was laid out in Randomized Complete Block Design (RCBD) consisting *five* treatments and *four* replications with the plot size of 40 sq.m. for each replication. The experiment includes 3% panchagavya, 2% vermiwash, 1% EM, 0.25% *seriboost* and control. The foliar spray was done with knapsack sprayer in the early hours of the day thrice on 15, 30 and 45 Days After Pruning (DAP). The farmyard manure and chemical fertilizers were applied at recommended quantity and irrigation was provided weekly twice.

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The pretreatment and post treatment counts were recorded before and after application of organic foliar spray respectively. Population of the pests was recorded a day prior to the treatment (14 DAP) and the post treatment counts at 22, 29, 37, 44, 52 and 58 DAP on five randomly selected plants from each replication during cooler hours preferably 6AM-7AM (Naranjo and Flint, 1995) [4]. The population of spiralling whitefly and thrips were recorded from leaves representing the top, middle and bottom portion of the plants. The border rows of the plots were avoided for the population count. (Sakthivel *et al.*, 2012) [6]. The per cent reduction in the population of the pests over the control was calculated as mean values of both the crops with the following formula (Abbott, 1925) [1]

$$\text{Percent reduction} = (\text{control-treatment}) / (\text{control}) \times 100$$

### Where

Control: Pest population on control plots

Treatment: Pest population on treatment plots

### Results and Discussion

There was increased population in all plots after first spray of organic formulations. After two sprays, population level was slightly reduced in panchagavya and EM treated plots

compared to control. Pest population before application of treatments was uniformly distributed all over the experimental plots and was found non-significant (Table 1 and 2). After I spray, there was slight reduction in pest population numerically in all treated plots compared to control and was statistically non-significant.

### Efficacy of organic foliar formulations against *Pseudodendrothrips mori* on mulberry

The thrips populations after 7 days of second spray in panchagavya and EM treated plots were at a par expect that of the plots sprayed with vermiwash and seriboost which was little lower than untreated plots. However, in both the crops, 7 DAS and 14 DAS after III spray, EM and panchagavya the thrips damage was found to be statistically on par with each other. The present result is in accordance with findings of Samuthiravelu *et al.* (2012) [7] who reported that minimum level of thrips infestation was observed in panchagavya and vermiwash treated plots. It was further supported by Sudhakar *et al.* (2018) [8] found that the lesser incidence of thrips (2.79%) in the panchagavya treated plots in mulberry. They observed that secretion of PGRS, antibiotic and toxic metabolites from the beneficial microbes in panchagavya that significantly control pests of many agricultural crops.

**Table 1:** Efficacy of organic foliar formulations against *Pseudodendrothrips mori* on mulberry

Treatments	Population of Thrips, <i>Pseudodendrothrips mori</i> (No./ Plant)								Overall mean	Per cent reduction
	Pre treatment	I spray		II spray		III spray				
		7 DAS	14 DAS	7 DAS	14 DAS	7 DAS	14 DAS			
Panchagavya @ 3%	16.78	18.26	20.31 <sup>a</sup>	19.56 <sup>a</sup>	18.21 <sup>b</sup>	14.29 <sup>a</sup>	8.64 <sup>a</sup>	16.58	19.42	
Vermiwash @ 2%	15.61	17.25	21.34 <sup>b</sup>	20.99 <sup>b</sup>	20.34 <sup>c</sup>	16.86 <sup>b</sup>	11.38 <sup>b</sup>	17.68	14.09	
EM @ 1%	15.81	18.38	20.13 <sup>a</sup>	18.32 <sup>a</sup>	17.38 <sup>a</sup>	14.75 <sup>a</sup>	9.03 <sup>a</sup>	16.31	20.73	
Seriboost @ 0.25%	14.94	16.28	22.34 <sup>b</sup>	21.58 <sup>b</sup>	19.84 <sup>b</sup>	16.98 <sup>b</sup>	14.09 <sup>c</sup>	18.00	12.50	
Control	15.29	17.98	19.34 <sup>a</sup>	20.17 <sup>a</sup>	22.21 <sup>c</sup>	23.87 <sup>c</sup>	25.21 <sup>d</sup>	20.58	0	
S.Ed	0.93	0.83	0.67	0.53	0.47	0.56	0.19	-	-	
CD(P=0.05)	NS	NS	1.33*	1.07*	0.93**	1.12*	0.38**	-	-	

NS – Non Significant, \*Significant; \*\* Highly significant

Each value is the mean of four replications

Mean followed by same alphabets are on par with each other

### Efficacy of organic foliar formulations against *Aleurodicus dispersus* on mulberry

Spiralling whitefly population was statistically non significant and uniformly distributed in the experimental plots before application of organic formulations (Table 2). After first application, there was increase in whitefly population in EM and panchagavya treated plots numerically. However, after second and third applications, there was a considerable

reduction in pest population observed in panchagavya and EM treated plots and were on par with each other. Boomiraj *et al.* (2004) [2] was reported that the foliar application of panchagavya at 7 per cent was effective against thrips infestation in moringa. Likewise; foliar application of EM was best to control pest population in organically grown cucumber was proved by Córdor Golec *et al.* (2007) [3].

**Table 2:** Efficacy of organic foliar formulations against on *Aleurodicus dispersus* mulberry

Treatments	Population of Spiralling Whitefly, <i>Aleurodicus dispersus</i> (No./ Plant)								Overall mean	Per cent reduction
	Pre treatment	I spray		II spray		III spray				
		7 DAS	14 DAS	7 DAS	14 DAS	7 DAS	14 DAS			
Panchagavya @ 3%	10.67	11.43	13.68	10.67 <sup>a</sup>	7.14 <sup>a</sup>	5.39 <sup>a</sup>	3.34 <sup>a</sup>	8.84	38.77	
Vermiwash @ 2%	12.38	11.63	12.92	11.28 <sup>a</sup>	9.68 <sup>b</sup>	7.53 <sup>b</sup>	5.01 <sup>b</sup>	9.91	31.35	
EM @ 1%	10.43	11.57	13.59	10.98 <sup>a</sup>	7.06 <sup>a</sup>	5.18 <sup>a</sup>	3.29 <sup>a</sup>	8.97	37.90	
Seriboost @ 0.25%	13.09	12.57	14.64	12.48 <sup>b</sup>	9.98 <sup>b</sup>	7.12 <sup>b</sup>	5.78 <sup>c</sup>	10.80	25.19	
Control	9.21	11.28	12.73	13.56 <sup>b</sup>	15.34 <sup>c</sup>	19.45 <sup>c</sup>	21.47 <sup>d</sup>	14.44	0	
SEd	0.61	0.71	1.03	0.86	0.44	0.37	0.16	-	-	
CD(P=0.05)	NS	NS	NS	1.72*	0.97*	0.74**	0.32**	-	-	

NS – Non Significant, \*Significant; \*\* Highly significant

Each value is the mean of four replications

Mean followed by same alphabets are on par with each other

## Conclusion

Based on the results of this study, The minimum damage by different pests viz., *Pseudodendrothrips mori* and *Aleurodicus dispersus* were observed in EM and panchagavya applied plants. However, the foliar spray of panchagavya at 3 per cent on 15, 30 and 45 DAP is ideal for magnify the mulberry pests. Hence, the application of different organic foliar formulations to mulberry as foliar spray also positively had an influence on controlling the sucking pests of mulberry.

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