



Management with leaf extracts of *Aphis gossypii* Glover (Hemiptera: Aphididae), a serious pest of *Mentha arvensis* L. at medicinal plant garden of Narendrapur, West Bengal

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Abstract

Among the five leaf extracts (black pepper, carrot, lemon grass, neem and green chilli+ garlic paste) all at 5% concentration, tested against *Aphis gossypii* infesting *Mentha arvensis* L. at medicinal plant garden of Narendrapur, West Bengal, revealed that black pepper leaf extract was the best, registering mortality of 82.32% followed by lemon grass (mortality-70.86%), green chilli+ garlic paste (mortality-68.99%), followed by carrot (mortality-65.93%) and neem leaf extract (mortality-46.57%).

Keywords: *Aphis Gossypii*, *Brevipalpus Euphorbiae*, *Mentha Arvensis*, concentration

Introduction

Mentha arvensis is an important plant having both medicinal and aromatic values and is grown at medicinal plant garden of Narendrapur. During summer of 2018, this plant was found heavily infested with *Aphis gossypii* damaging the host seriously. Hence, it was thought if control of pest can be achieved with some plant extracts and keeping that in view, a laboratory experiment was carried out to evaluate efficacy of five plant extracts viz. black pepper, carrot, lemon grass, neem, green chilli+garlic paste, all at 5% concentration and the results thereof is presented in this paper.

Materials and Methods

For preparation of plant extracts, the technique of Gupta *et.al.* (2007) [2] was followed. Its application was done on test insect kept on *Mentha* leaf in eppendorf tubes, each having 10 test insects. For each treatment, three replications were maintained with one control where no spray was done. So, altogether there were sixteen eppendorf tubes. The mouth of each tube was covered with a malmal cloth tightly fastened with rubber band. 1 ml of plant extract was applied on each of the tube directly with the help of a hypodermic syringe. Observations towards causing mortality were recorded at different intervals like 24,48,72,96 and 120 hours. At the end, the mean mortality was calculated.

Results and Discussion

The data pertaining to percentage mortality achieved at different intervals due to application of plant extracts on *Aphis gossypii* infesting *Mentha arvensis* have been given in Table-1.

24 hours interval

At this interval, the extract of black pepper had shown a good knockdown effect registering mortality of 60.52% which was superior to all other treatments. This was followed by green chilli+ garlic paste as well as extract of lemon grass where the mortality was 43.00% and 40.00%, respectively and both were at par. This was followed by carrot extract (26.66%)> neem extract registering 23.84%.

In case of control, no mortality was recorded. It appeared that all plant extracts could cause mortality but the degrees varied.

48 hours interval

At this interval, as was seen in previous case, black pepper registered highest mortality of 77.66% which was significantly better than other treatments. Lemon grass and carrot leaf extracts registering mortality of 64.33% and 58.33% were at par. These two were followed by green chilli+ garlic paste where the mortality was 51.31% and was superior to neem leaf extract, the latter registered mortality of 28.37%. Therefore, at this interval, it was seen that the mortality percentage improved in all treatments and black pepper leaf extract continued giving highest mortality.

72 hours interval

The trend of result at this interval was more or less same as in this case also black pepper extract was the best giving mortality of 83.33% followed by green chilli+ garlic paste registering mortality of 75.16%, followed by lemon grass and carrot leaf extracts where the mortality was 66.66% and 61.32%, respectively. The mortality percentage was lowest in neem leaf extract where it was 39.92%. No mortality was recorded in case of control.

96 hours interval

At this interval, the leaf extract of black pepper, carrot, lemon grass leaf extracts and green chilli + garlic paste, all were at par registering mortality which ranged from 82.15%-90.10%. The lowest mortality was recorded in case of neem leaf extract. No mortality was recorded in case of control.

120 hours interval

At this interval black pepper, carrot, lemon grass leaf extracts and green chilli+ garlic paste all were at par. In the first three treatments 100% mortality was noted and neem leaf extract recorded the lowest mortality of 89.92%. No mortality was recorded in case of control.

Mean mortality

The mean mortality can be arranged in the following descending order as:- leaf extracts of black pepper (82.32%)>lemon grass (70.86%)= green chilli+ garlic paste(68.99%)=carrot (65.93%)> neem leaf(46.57%).

Conclusion

- All the plant extracts tested in this study had shown insecticidal property causing mean mortality ranging from 46.57% upto 82.32%. The overall mortality was highest in black pepper leaf extract and lowest in neem leaf extract.
- The other plant extracts were quite good giving over

60% mortality.

- No mortality was recorded in case of control treatment.
- This laboratory experiment needs to be repeated with field experiment for confirmation of the present results.

Since none of the earlier workers included in their trials the plant extracts taken in the present study, the results obtained now could not be compared with those of others. Gupta (2012) [1] in his book provided a review on the effectiveness of plant extracts against mite pests and in that both neem and chilli leaf extracts were reported to be registering 100% mortality against *Brevipalpus euphorbiae*.

Table 1: Percentage mortality of plant extracts at different intervals against *Aphis gossypii* infesting *Mentha arvensis* L. based on laboratory trial

Treatments	Initial population	Percentage mortality of aphid at different intervals after spraying					
		24 hours	48 hours	72 hours	96 hours	120 hours	Mean
Black pepper leaf extract (5%)	10	60.52	77.66	83.33	90.10	100	82.32
Carrot leaf extract (5%)	10	26.66	58.33	61.32	83.33	100	65.93
Lemon grass leaf extract (5%)	10	40	64.33	66.66	83.33	100	70.86
Neem leaf extract (5%)	10	23.84	28.37	39.92	50.79	89.92	46.57
Green chilli+ garlic paste (5%)	10	43	51.31	75.16	82.15	93.35	68.99
Control	10	-	-	-	-	-	-
Cd at 5% level		4.96	7.12	6.33	8.31	7.35	6.81

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