

A laboratory evaluation of some leaf extracts against *Ferrisia virgate* (Cockrell) infesting *Calotropis gigantea* (L.) at medicinal plant garden of Narendrapur, West Bengal

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Abstract

Among the six leaf extracts, viz. (black pepper, carrot, lemon grass, wood apple, marigold and tulsi - all at 5% concentration) were evaluated to cause mortality of *Ferrisia virgate* (Hemiptera : Pseudococcidae) infesting *Calotropis gigantea*. So far as mean mortality is concerned, among all the six extracts, marigold and wood apple were better as compared to other treatments, Tulsi was just next to the former two and black pepper, carrot and lemon grass were inferior to the other treatments.

Keywords: *Calotropis gigantea*, *Ferrisia virgate*, pseudococcidae, hypodermic syringe

Introduction

The *Calotropis gigantea* grown in the medicinal plant garden of Narendrapur was found to have been attacked by mealy bug (*Ferrisia virgate*) on leaf surfaces causing yellowing and drying of leaves. It was thought necessary to control the pest with some plant extracts and evaluate their efficacies towards causing mortality of the pest. The present paper embodies the results of the same.

Material and Methods

For preparation of plant extracts, technique of Gupta *et al* (2007) [2] was followed and its application on the test insect species was done on excised *Calotropis gigantea* leaf kept on wet cotton pad in Petri dish, each having 10 mealy bug specimens (*Ferrisia virgate*). For each treatment, three replications were maintained with one control having no spray done on that. So, altogether there were nineteen excised leaves and on each 1ml of plant extract was applied 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 also calculated.

Results and Discussion

The data pertaining to assessment of plant extracts on *Ferrisia virgate* infesting *Calotropis gigantea* at various intervals had been given in Table-1

24 hours

At this interval, marigold registered the highest mortality of 49.91% which was significantly superior to all other treatments. Wood apple leaf extract, Tulsi leaf extract and lemon grass leaf extract registering mortality of 35.91%, 33.21% and 30.19%, respectively were next in order and all three were statistically at par. The carrot leaf extract which registered 26.66% mortality was superior to black pepper leaf extract where the mortality was 20.32%. No mortality was recorded in case of control.

48 hours

All the treatments had shown improvement towards causing mortality. It was 68.05% in case of marigold being at par with wood apple leaf extract (60.01% mortality). This was followed by Tulsi leaf extract (46.00% mortality). Both carrot leaf extract and lemon grass leaf extract registering mortality of 37.25% and 34.17%, respectively were at par and black pepper leaf extract was poorest among all, where the mortality was 28.57%. No mortality was recorded in case of control.

72 hours

The trend of mortality was almost similar as was seen in previous 2 intervals. The highest mortality was 82.25% in marigold which was significantly superior to all other treatments. That was followed by both Tulsi leaf extract (73.02% mortality) = wood apple leaf extract (71.29% mortality) and were superior to carrot leaf extract, lemon grass leaf extract and black pepper leaf extracts where the mortality was 49.04%, 45.55% and 45.56%, respectively and all were at par. No mortality was recorded in case of control.

96 hours

As it was seen in earlier cases, marigold (89.21% mortality) was superior to other treatments excepting wood apple leaf extract and Tulsi leaf extracts registering mortality of 88.02% and 86.41%, respectively. Other three treatments, viz. black pepper, carrot and lemon grass registered mortality of 69.85%, 67.77% and 69.44%, respectively were at par. No mortality was recorded in case of control.

120 hours

At this interval, marigold leaf extract, wood apple leaf extract and Tulsi leaf extract were at par registering mortality of 100%, 97.30% and 94.55% respectively. The rest of the remaining three leaf extracts were at par registering mortality of 90.12%, 83.59% and 81.59% in case of black pepper, carrot and lemon grass, respectively. No mortality was recorded in case of control.

Mean mortality

The mean mortality in six different treatments can be arranged in the following descending order:- Marigold leaf extract (77.88 % mortality) = wood apple leaf extract (70.50% mortality) > Tulsi leaf extract(64.64% mortality) > black pepper leaf extract (50.88% mortality) = carrot leaf extract (52.86% mortality) = lemon grass leaf extract (52.18% mortality). Since earlier to this study no one conducted any trial with any of the plant extracts against the test insect, *Ferrisia virgata*, the present result could not be compared with those of the earlier ones.

Conclusion

The above experiment has proved that

- All the leaf extracts had proved insecticidal property

against *Ferrisia virgata*.

- Among the treatments, marigold leaf extract and wood apple leaf extract were better compared to other treatments and Tulsi leaf extract was just next to the former two.
- Black pepper extract, carrot leaf extract and lemon grass leaf extract were inferior to the other treatments mentioned earlier.
- Gupta 2012 reviewed the performance of various plant extracts against mite pests and there also marigold, wood apple leaf extracts were reported to be having good acaricidal effects. This is a laboratory experiment and needs to be repeated for the confirmation of the result.

Table 1: Percentage mortality of leaf extracts at different intervals against *Ferrisia virgata* infesting *Calotropis gigantea* under laboratory condition:

Treatments (leaf extracts at 5% concentration)	Initial Population	Percentage mortality at different intervals (hours) after spraying					
		24	48	72	96	120	Mean mortality
Black pepper	10	20.32	28.57	45.56	69.85	90.12	50.88
Carrot	10	26.66	37.25	49.04	67.77	83.59	52.86
Lemon grass	10	30.19	34.17	45.55	69.44	81.59	52.18
Wood apple	10	35.91	60.01	71.29	88.02	97.30	70.50
Marigold	10	49.91	68.05	82.25	89.21	100	77.88
Tulsi	10	33.21	46.00	73.02	86.41	94.55	66.64
Control	10	--	--	--	--	--	--
CD at 5% level		5.36	8.39	7.51	8.14	7.66	7.41

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