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Comparative study of field efficacy of *Curcuma longa* and *Nigella sativa* against *Apheliona maculosa* on *Glycine max*

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ABSTRACT

Jassids are also scientifically known as *Apheliona maculosa*. The pests suck sap from the leaves and stems and have green appearance. Due to the suction of sap the margin of leaf starts becoming yellow which is a characteristic feature to identify the plants infected by *Apheliona maculosa*. In severe cases the foliage turns yellow and then dries and falls of. Yield loss of *Glycine max* due to the pests is approximately 40-45%.. When the crop age is 35-40 days then dimethoate is sprayed i.e. 30 EC @ 2ml /lit. This can be repeated after 15 days if it is required. Except that oxydemeton methyl 25 EC @2ml/lit or 0.05 % quinalphos 25 EC @ 2ml/lit can be sprayed. Although chemicals protect the yield but they are harm the environment. So for the sake of environment, bio-pesticides should be adopted now. The present study has the following extracts that may be used as bio-pesticide, i.e. *Curcuma longa* and *Nigella sativa*. At an interval of 1 week these extracts were used for 4 days for checking their efficacy against *Apheliona maculosa*. When results were observed it showed that *Nigella sativa* was more effective with mortality of about 74.35% and *Curcuma longa* with only 63.69% of mortality. However *Curcuma longa* showed fewer efficacies than *Nigella sativa*. Damage % on *Glycine max* after application of 1st , 2nd , 3rd and 4th round of *Curcuma longa* was 2.38, 2.67, 2.93 and 3.02 whereas for *Nigella sativa* it was 2.24, 2.62, 2.84 and 2.92. Percent infestation was reduced when *Nigella sativa* was used.

INTRODUCTION

For sustaining life on earth and for having symbiotic association with N2 fixing bacteria Leguminous plants have been one of the most important plant species. However some pests like *Apheliona maculosa* are most harmful for these plants as their larvae and adults feed on these plants. These pests not only affect the quantity but also the quality of the plants and their products. Chemical pesticides are cost effective and easy means to avoid these pests but these chemicals are too harmful for the environment. These chemicals may develop pest resistance and have potential to kill the non-targeted organisms too. So it's the need of the hour to use means that could be equally effective as the chemical pesticide and would be environment friendly. Bio-pesticides are the best alternative known so far. "Bio-pesticides are the secondary metabolites that the plants produce for safety against nematodes, viruses, pests etc. These secondary metabolites can be readily used as bio-pesticides."

MATERIAL AND METHOD:

Plant specimens were collected from different parts of Kanpur city of Uttar Pradesh (India) on the basis of their availability & insecticidal properties. The plant materials were shed-dry. After that process, ethyl acetate was used to make homogenous spray solution of the following materials.

- REARING OF PEST: Eggs of *Apheliona maculosa* were collected from CSA University Kanpur U.P. Rearing was done on leaf of *Glycine max*. Neonate larvae were kept individually in a plastic box with abundant leaves of *Glycine max* as their food. As soon as the larvae became adults they were allowed to mate by keeping them paired.
- TREATMENTS: T1-*Curcuma longa*, T2-*Nigella sativa*.
- PROCEDURE OF TREATMENT APPLICATION: The homogenous spray solutions were sprayed at the time of first symptom of infestation. Then after that these extracts were sprayed after an interval of 1 week for about four times to see their effectiveness against the pest *Apheliona maculosa*.
- DATA COLLECTION: Data was collected from the plots of treatment after every 7 days.
- STATISTICAL ANALSIS: The correction of the experimental data was done by Abbott's formula and after that the analysis was done using the ANOVA method.

TABLE-1: % damage in *Glycine max* after multiple rounds of treatment:

Treatment	After 1st treatment	After 2nd treatment	After 3rd treatment	After 4th treatment
Curcuma longa	2.38	2.67	2.93	3.02
Nigella sativa	2.24	2.62	2.84	2.92
Control	8.54	8.87	9.77	11.36

CHART-1: % damage in *Glycine max* after multiple rounds of treatment:

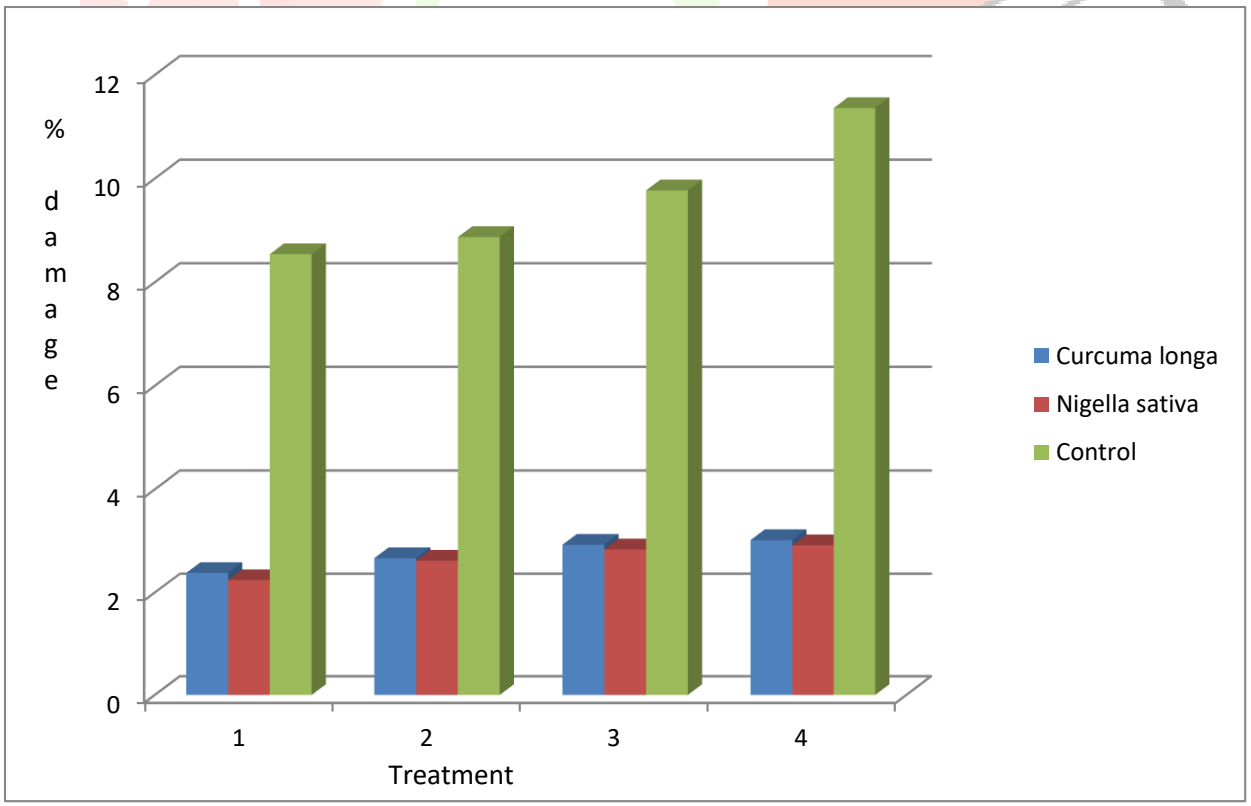
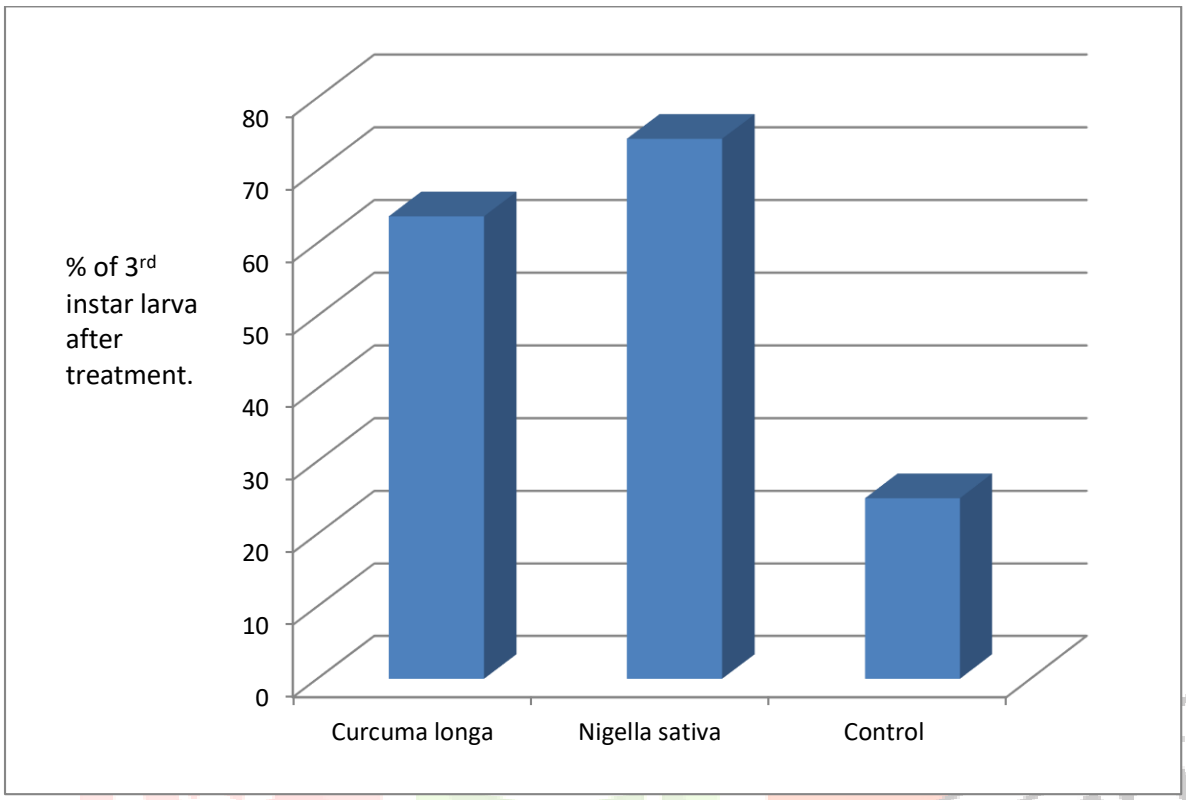


TABLE-2: Mortality % of 3rd instar larva of Apheliona maculosa after treatment.

Treatment	Mortality % of 3rd instar larva of Apheliona maculosa after treatment.
Curcuma longa	63.69
Nigella sativa	74.35
Control	24.93

CHART-2: % of 3rd instar larva of *Apheliona maculosa* after treatment.



RESULT AND DISCUSSION:

The control of *Apheliona maculosa* was done by bio-pesticidal extracts of *Curcuma longa* and *Nigella sativa*. The results confirmed that *Apheliona maculosa* is a serious pest to *Glycine max*. The best screeningof bio-pesticide was done by the comparing the untreated plot with the treated one. Among the two of them, *Nigella sativa* was more effective than *Curcuma longa*. When results were observed it showed that *Nigella sativa* was most effective with highest mortality of about 74.35% and *Curcuma longa* with only 63.69% of mortality. Damage % on *Glycine max* after application of 1st , 2nd , 3rd and 4th round of *Curcuma longa* was 2.38%, 2.67%, 2.93% and 3.02% whereas for *Nigella sativa* it was 2.24%, 2.62%, 2.84% and 2.92%. Percent infestation reduced when *Nigella sativa* was used.

CONCLUSION:

However both the botanical extracts performed very well in the experiment but *Apheliona maculosa* could be best controlled by *Nigella sativa*. Bio-pesticides are best effective way control the targeted pest & bio-pesticides are eco-friendly.

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