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# EFFICACY OF SOME BOTANICAL MATERIALS AGAINST THE RED PUMPKIN BEETLE, *Aulacophora foveicollis (Lucas) (Coleoptera: Crhrysomelidae)*

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## ABSTRACT

**The red pumpkin beetle, *Aulacophora foveicollis* (Lucas), is a serious pest of Ducurbits. Different botanical materials i.e. Neem (*Azadirachata indica* A. Juss.), Chinaberry (*Melia azederach* L.), Titepati (Artemisia vulgaris Nees) were tested for their efficacy against this insect. All the treatments were significantly better than the control in reducing feeding damage. Among the various botanical materials evaluated on watermelon seedlings. Neem oil was found effective in controlling the beetle i.e. 100% mortality within 24 hours and over 90% damage reduction) for three days.**

**Additional key words:** Biopesticides , mortality, cucurbits,

## INTRODUCTION

Cucurbits include the largest number of summer and rainy season vegetables in Nepal. These vegetables are attacked by a number of insect pests the red pumpkin beetle. Aulacophora foveicollis (Lucas). Adult beetles make characteristic perforations on leaves causing drying and finally death of young seedlings. In mature plants, besides leaves, they also feed on flower buds,flowers and young fruits. The grubs remain in the soil and are active throughout the year feeding on the roots and stems of cucurbits. Therefore, it is necessary to protect cucurbit seedlings from the beetles either by planting least preferred variety or by applying insecticides (Thapa and Neupane, 1992) the use of botanical materials for the control of this insect at the Institute of Agriculture and Animal Science, Rampur, Chitwan during 1991/92.

## MATERIALS AND METHODS

Seedlings of 'Sugar Baby' watermelon (*Citrullus lanatus* (Thunb.) were raised in earthen pots (30 cm diameter ) in the screenhouse i. E. under insect free and partial shade. After one month, individual seedling in each pot was soaked in various plant materials extracts, namely, leaf, seed, powder and oil extract of Neem *(Azadirachtta indica* A. Juss), leaf and seed extract of *Melia (Melia azederach* L.), Titepati (*Artemisia vulgaris* L.) and Asuro (*Adathoda vasica Nees*) including wather (control). All plant materials were used at 1:5 ratio (fresh plant material: water) but neem powder and oil were appplied as 1% spray solution. After the spray liquid dried on the treated seedlings, twenty adult beetles (field collected) were introduced inside the pot covered with nylon screen. One replication consisted of three pots and was repeated three times. Damage was recorded at 24, 48 and 72 hours.

A few leaves were also collected separately from each extra treated seedlings, put into plastic bags and brought to the laboratory for no-choice and restricted choice test. Under no-choice test, small leaf disc (2 cm diameter) was placed on the center of a petridish (9 cm diameter) with moist filter paper at the bottom and five adult beetles (field collected) were introduced inside the

petridish. In another set of experiment (restricted-choice i. E. control vs treated), both treated and untreated leaf discs were placed on pleriphery of a pertidish (9 cm diameter ) with moist filter paper at the bottom and five adult beetles were released inside as above. Four petridishes were maintained for each treatment. All the petridishes were kept at the normal room temperature (25-27 C). the feeding damage and insect mortalities (no-choice) and only feeding damage (restricted choice ) were recorded after 24 hour.

## RESULTS AND DISCUSSION

Effects of various botanical materials against the adult red pumpkin beetle (*A. foveicollis*) under free-choice and partial shade are presented in Table 1A. All the treatments were statistically different from the control for the recorded periods in reducing the seedling damage. Neem and Melia extracts were found quite effective (10 – 20 times higher) against this beetle. Artemisia leaf and Neem/Melia seeds lost their actions faster than other treatments while Neem leaf extract and Neem oil spray showed a constant reaction over the time and thus proved to be of more significance than other materials.

Table 1. Efficacy of various botanical materials against *A. foveicollis* on cucurbit seedlings under screenhouse condition. Rampur, Chitwan, 1991/92*

| Treatment | Seedling Damage at Indicated Hour | | | |
|---|---|---|---|---|
| | 24 | 48 | 72 | T-Mean |
| Neem leaf | 0.90 Ac | 1.70 Ad | 3.30 Ae | 1.97 |
| Melia leaf | 0.70 Bc | 2.60 Abd | 8.10 Ae | 3.28 |
| Artemesia leaf | 6.90 Cb | 29.20 Bbc | 49.40 Ab | 28.50 |
| Asuro leaf | 2.90 Bbc | 10.50 Ac | 17.60 Ad | 10.33 |
| Neem seed | 7.30 Cb | 30.60 Bb | 55.60 Ab | 31.16 |
| Melia seed | 3.90 Cbc | 12.80 Bc | 33.30 Ac | 16.67 |
| Neem powder | 3.20 Bbc | 6.30 Abcd | 10.00 Ad | 6.50 |
| Neem oil | 1.40 Ac | 2.90 Ad | 4.50 Ae | 2.96 |
| Control | 23.60 Ca | 46.10 Ba | 69.50 Aa | 46.41 |

- Means followed by same capital letters in a row and small letters in a column ate not significantly different at 5% level by DMRT.

Table 2 shows the efficacy of the tested materials under laboratory condition. Except Neem powder and Asuro leaf extract. All the treatments were significantly better than control. Both under no-choice and restricted-choice conditions, neem oil was found best in terms of adult beetle control and leaf damage reduction. Under no-choice testy, all the adults died and complete leaf protection was obtained whereas under restricted-choice (control vs treated) no adult mortality was observed but the feeding damage was reduced significantly on the treated leaf discs compared to the control. Even untreated leaf discs were less damaged in petridishes in which choice were provided with the leaves treated with Neem powder or Neem oil 1% as compared to leaf discs treated with other materials which clearly indicated the repelling action of Neem powder and Neem oil against the beetle. Neem and Melia seed extract also showed

mild repelling action. However, such property was not detected in leaf extracts and were equally at par with the control.

Table 2. Efficacy of various botanical materials against *A. foveicollis* on cucurbit seedlings under lab condition. Rampur, Chitwan, 1991/92*

| Treatment | No-choice | | Restricted Choice | | |
|---|---|---|---|---|---|
| | Damage(%) | Adult died | Control | Treatment | Diff. |
| Neem leaf | 13.33 bc | 0.00 b | 95.00a | 5.67 e | 89.33** |
| Melia leaf | 26.67 bc | 0.00 b | 91.67 a | 11.33 de | 80.33** |
| Artemesia leaf | 35.00 bc | 0.00 b | 88.33 ab | 26.67 cde | 61.67** |
| Asuro leaf | 33.33 bc | 0.00 b | 86.67 ab | 71.67 ab | 15.00ns |
| Neem seed | 53.33 ab | 0.00 b | 68.33 bc | 35.00 bc | 33.33* |
| Melia seed | 48.33 ab | 0.00 b | 65.00 bc | 16.67 cde | 48.33** |
| Neem powder | 95.00 a | 0.00 b | 41.67 cd | 41.67 cd | 1.67 ns |
| Neem oil | 0.00 c | 100.oo a | 26.67 d | 8.33 e | 18.33* |

- Means followed by same letters in a column are not significantly different at 5% by DMRT.

Plants products are known to contain biologically active components that may act as toxicants, repellents, antifeedants, and growth disturbing substances on insect pests. These properties and their appropriate concentration are of great significance in reducing pest damage. In the present study, repelling action of Neem powder and Neem oil was not detected under screenhouse condition which indicated that recommendations based on the laboratory biossay will not be reliable unless confirmed through the field or screenhouse studies. Thapa and Neupane (1992) studied seasonal incidence, behaviour and control of this insect using various chemical pesticides which can give satisfactory control of red pumpkin beetle for a short time. Furthermore, these materials and different form of the same material indicates that only neem oil was effective providing 100% mortality of the beetle, and therefore, there is need of verifying several botanical materials (Thapa, 1994)

## REFERENCE CITED

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