

EFFECT OF PLANT EXTRACTS SPRAY ON FRUITFLY TRANSMISSION OF CUCUMBER MOSAIC VIRUS

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Efficacy of six Angiospermic plant species, namely *Pongamia pinnata*, *Catheranthus roseus*, *Vitex negundo*, *Ocimum sanctum*, *Psoralea corylifolia*, *Azadirachta indica* have been studied against transmission of cucumber mosaic virus (CMV) disease on *Cucumis melo* cultivars (Arkajeet, Arkarajhans). All the above test products reduced vector population and virus incidence.

Keywords : Ecofriendly; Insecticides; Pesticides; Transmission; Vector population; Virus incidence.

In vegetable growing area of Faizabad (U.P.) district Cucumber mosaic virus is a more destructive disease of *Cucumis melo* crop. The fruit fly (*Dacus cucurbitae*) vector play very important role for the transmission of this viral disease. For the control of these viral incidence, prevention and control of the vector population was undertaken with the application of natural test product, which exhibited pesticidal/insecticidal properties and were ecofriendly and quickly biodegradable.

In India, plants and their products have been used as pesticides/insecticides since ancient times. Several workers have reported the insecticidal/pesticidal properties of some plant extract against vector population¹⁻⁷.

Cucumber mosaic virus culture was obtained from naturally affected *Cucumis melo* cultivars (Arkajeet, Arkarajhans). Which are grown in the vegetable growing field areas of Faizabad (U.P.). These virus are readily fruit fly (*Dacus cucurbitae*) transmissible. It had a restricted host range in cucurbitaceous family plant with Thermal Inactivation Point (T.I.P.) between 65^o- 70^oC and Dilution End Point (D.E.P.) 1:10,000,000. The virus (CMV) culture was maintained on two cucumis melo varieties "Arkajeet" and "Arka rajhans" through fruit fly transmission.

The experiment was conducted with fruitfly (*Dacus cucurbitae*) vectors of cucurbitaceous vegetable crops. The adult fruitfly were starved for 30 min, given an acquisition access on infected plants for 5 min, and released in groups on healthy *Cucumis melo* plants for 24 hours transmission access.

The fruitfly were removed from plants with a brush and not killed by an insecticidal spray, lest it should interfere with the action of plant extracts. The 15-20% plant leaf extracts of *Azadirachta indica*, *Vitex negundo*, *Ocimum sanctum*, *Psoralea corylifolia*, *Pongamia pinnata*, *Catheranthus roseus* used as sprays. Their effect on virus transmission was studied by releasing viruliferous fruitfly on plant extract sprayed healthy plant 24 hours, after treatment. To test the effect of plant extracts spray on virus acquisition, non viruliferous fruitfly were given acquisition access on plant extract sprayed infected *Cucumis melo* plants and then tested for their transmission ability. The residual efficacy of plant extracts spray in preventing virus acquisition was determined by releasing fruitfly for acquisition access on infected plant at 0, 24, 48, 72, 120 hours intervals after spraying and then releasing on healthy plants to see if the fruitfly carried any virus.

It was observed that none of the test plant sprayed with 15-20% of *Catheranthus roseus* and *Vitex negundo* leaf extracts developed symptoms of CMV infection which indicate that the two plant leaf extracts completely inhibited the fruitfly (*Dacus cucurbitae*) population and the incidence of CMV, and rest of the four plant leaf extracts *Azadirachta indica*, *Psoralea corylifolia*, *Pongamia pinnata*, *Ocimum sanctum* reduce virus transmission by 10.3, 15.2, 18.3, 20.5% respectively as shown in Table 1. However, all plant leaf extracts inhibited virus acquisition when fruitfly had acquisition access immediately after treatment (Table 1).

Table 1. Effect of 15-20% of six plant leaf extracts on transmission and acquisition of CMV by fruitfly (*Dacus cucurbitae*) vector.

Plant Leaf Extracts (15 - 20%)	Transmission Percentage (%)	Period of Symptoms (Days)	Acquisition percentage (When tested immediately after treatment) (%)
<i>Ocimum sanctum</i>	20.5	18	0.0
<i>Pongamia pinnata</i>	18.3	22	0.0
<i>Vitex nigundo</i>	0.0	00	0.0
<i>Catheranthus roseus</i>	0.0	00	0.0
<i>Azadirachta indica</i>	10.3	25	0.0
<i>Psoralea corylifolia</i>	15.2	22	0.0
Control(water sprayd)	80.0	15	80
Control (Unsprayed)	78.0	12	80

The inhibitory effect of *Catheranthus roseus* and *Vitex nigundo* tested upto 48 hours as the interval after the plant leaf extract spray increased the effectiveness of the plant extracts correspondingly decreased. After 72 hours, 20% of the plants got infected, but 120 hours after treatment 60% of plants developed CMV symptoms. In all cases where plants developed CMV symptoms, the incubation period of the virus increased to 20-25 days when compared with 10-15 days in the control.

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