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EFFECT OF PLANT EXTRACTS FOR THE MANAGEMENT OF TOMATO LEAFCURL VIRUS (TLCV) IN TOMATO (*Lycopersicon esculentum*, Mill)

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ABSTRACT

The experiment conducted in glass house for the management of tomato leaf curl virus in tomato revealed that among the 38 non-host plant species tested at 10% concentration as pre-inoculation spray, leaf extracts from *Mirabilis jalapa* and *Catharanthus roseus* recorded 96% reduction in TLCV infection over contrl followed by *Vitex negundo, Eucalyptus globulus, cynodon dactylon, Pongamia glabra, Acacia arabica* leaf and pod *Pithecellobium dulce* bark, *Datura metal, Thuja occidentalis, Ocimum sanctum, Coleus parviflorus, Mentha piperita* and *Dioscorea alata* with reduction of disease varying from 84-92% over control.

KEY WORDS : TLCV, Plant extract, % disease reduction

Tomato is one of the important vegetable crop grown in all agroclimatic conditions spread over from tropical to temperate countries of the world. Among the various diseases affecting the crop, TLCV is the most destructive disease. Ramakrishnan *et al.*, (1965) reported 31% yield loss in and around Coimbatore while Butter and Rataul (1973) reported yield loss upto 66% in Punjab state while Sastry and Singh (1973), Saikia and Muniyappa (1989) reported losses upto 92.3 and 50 - 70% respectively in Karnataka. The disease can be managed to some extent by spraying with insecticides to control the whitefly, *Bemisia tabaci* Gen. (Saikia and Muniyappa, 1989). The insecticides causes residual health hazard. Hence the study was undertaken to manage the disease with plant extracts.

MATERIALS AND METHODS

The experiment was conducted in the glasshouse of the Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore during 1995. A total of 38 non-host plant species were tested by taking 10% acqueous leaf extracts. The extracts were prepared by grinding leaf in a mortal with pestle by using sterilized water at the rate of one ml per g of plant tissue and filltered through cheese cloth. The plant extracts containing the antiviral principles were diluted further to have 10% concentration (V/W). The antiviral principles (AVP's) from various plants were sprayed @ 2 ml per plant on 25 days old CO 3 tomato plants on sets of 5 plants. Control plants were sprayed with water. Twenty four hours after the application of AVPs the tomato plants were inoculated with viruliferous whiteflies @ 3 insects per plant and then killed after 24 h of inoculation feeding by spraying with monocrotophos @ 1 ml/lit of water. Each treatment was replicated 5 times. Percentage of plants infected and % reduction over control in different treatments were determined by observing the plants daily.

RESULTS AND DISCUSSION

All the 38 non-host plants tested in the experiment reduced the leaf curl infection significantly. Among them leaf extracts from *Mirabilis jalapa* and *Catharanthus roseus* recorded 96% reduction in TLCV infection over control. This was followed by *Vitex negundo, Eucalyptus globulus, Cynodon dactylon, Pongamia glabra, Acacia arabica* leaf and pod, *Pithecellobium dulce* bark, *Datura metal, Thuja occidentalis, Ocimum sanctun, Coleus parviflorus, Mentha piperita* and *Dioscorea alata* with % reduction of disease varying from 84 to 92% over control (Table 1). The presence of antiviral principles in non-host plant species effective against different viruses has been reported by several workers (Allard, 1914 ; Smookler, 1971 and Baker and Cook 1974). Narayanasamy and Ramiah (1983) reported that AVPs from coconut, sorghum and finger millet were highly effective against tomato spotted wilt virus (TSWV) and inhibited local lesion formation in cowpea by 90%. Ganapathy (1985) also confirmed this report and found that other non-host

Table 1: Effect of plant extracts on tomato leafcurl virus infection

S. No.	Name of the plant species	% infection	% reduction over control
01.	*Mirabilis jalapa*, L.	4.00 (11.54)	96.00 (78.46)a
02.	*Catharanthus roseus*	4.00 (11.54)	96.00 (78.46)a
03.	*Vitex negundo* L.	8.00 (16.43)	92.00 (73.57)ab
04.	*Eucaluptus globulus* labill	8.00 (16.43)	92.00 (73.57)ab
05.	*Cynodon dactylon* pers	8.00 (16.43)	92.00 (73.57)ab
06.	*Pongamia glabra* vent.	12.00 (20.27)	88.00 (69.73)abc
07.	*Acacia arabica* kikar	12.00 (20.27)	88.00 (69.73)abc
08.	*Acacia arabica* (pod extract)	12.00 (20.27)	88.00 (69.73)abc
09.	*Pithecellobium dulce* Benth (Bark extract)	12.00 (20.27)	88.00 (69.73) abc
10.	*Datura metal* L.	12.00 (20.27)	88.00 (69.73)abc
11.	*Thuja occidentalis* L.	12.00 (20.27)	88.00 (69.73)abc
12.	*Ocinum sanctum* L.	16.00 (23.58)	84.00 (66.42)abcd
13.	*Coleus parviflorus* Benth	16.00 (23.58)	84.00 (66.42)abcd
14.	*Mentha piperita* L.	16.00 (23.58)	84.00 (66.42)abcd
15.	*Dioscorea alata* L.	16.00 (23.58)	84.00 (66.42)abcd
16.	Control (water spray)	100.00 (90.00)	-

CD (P=0.05) 8.18

Mean of 5 replications (5 plants per replication)

(Figures in parentheses are arcsine transformed values).

species namely *Nerium odorum* and *Tubernomantana diversicate* also contained effective AVPs. Similar results were also obtained by Krishnamoorthy (1994) who found that AVPs from *Mirabilis jalapa* and *Vitex negundo* to be highly effective against urdbean leaf crinkle virus. Narayanasamy (1984) and Verma and Khan (1985) viewed that the AVP might induce the resistance by activating the host defence system. Further research on this line in characterising the active principle in the plant products will be useful for commercial exploitation in the management of tomato leaf curl virus.

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