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ANTIFUMGAL ACTIVITY OF SOME COMMON MEDICINAL PLANTS AGAINST *Fusarium lycopersici*

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ABSTRACT

Twenty five plant samples belonging to seventeen angiospermic families were screened for their antifungal activity against *Fusarium lycopersici*, the cause of wilt of tomato. Among these, leaf extract of *Psidium gujava* belonging to the family *Myrtaceae* was found most active against test fungus *Fusarium lycopersici*.

KEYWORDS: Antifungal Activity, Medicinal Plants, *Fusarium lycopersici*

Fusarium lycopersici, the causal organism of wilt disease of tomato is one of the most distructive fungus which attacks the tomato plant and cause severe damage to crop. A large number of synthetic pesticide especially fungicides have been used extensively to control the diseases and other harmfull organism. Most of these synthetic fungicides that have been commercialized are halogenated hydrocarbons with long environmental lives and more suspected toxicological properties than the natural compounds. Hence a search for an environmentally safe and easily biodegradable fungitoxicant for the control of disease which are easily biodegradable and provide inexhaustible resources is needed (Beye, 1978). Some plant extracts have been earlier reported as antifungal by several workers (Duke, et al. 1988; Beg et al. 1995; Thapliyal et al 2000; Lopez et al. 2002). Therefore, the present study was an attempt to test antifungal activity of some common medicinal plant extracts against *Fusarium lycopersici* in order to find out a source of biofungicide which are largely systemic, less phytotoxic and easily biodegradable.

MATERIALS AND METHODS

Different parts of some common medicinal plants were collected from local vegetation and brought into the laboratory. 20 gm of plant parts were taken from each one of these samples and surface sterilized with 70 per cent alcohol and finally with sterilized distilled water. Then they were crushed by pestle and mortar and extracted with 20 ml. of sterilized distilled water and filtered aseptically through doubled layered cheese cloth. Thus the obtained extract was subjected to antifungal assay by poisoned food technique (Grover and Moore, 1962). 5 ml. aqueous extract of each plant parts were mixed with 10 ml. of molten Czapeck's Dox Agar medium in a pre sterilized petriplates separately and swirled properly. In control set the medium was supplemented with 5 ml sterilized distilled water instead of aquous extract of plant parts. Each petriplate was inoculated with a mycelial disc of 4 mm diameter taken from the periphery of 7 days old culture of *Fusarium lycopersici* grown on Czapek's Dox Agar medium. Three replicates were used for each treatment and control. All petriplates were incubated at 28^0C and radial mycelial growths were recorded in cm after six days. Fungitoxicity was calculated and recorded in term of per cent inhibition of mycelial growth by the following formula:-

$$\text{Percent inhibition of mycelial growth} = \frac{dc - dt}{dc} \times 100$$

Where dc = mean colony diameter of control

dt = mean colony diameter of treatment

RESULTS AND DISCUSSION

All plant extracts showed inhibitory effect against mycelial growth of the fungus *Fusarium lycopersici*. Among all the samples screened, the leaf extract *of Psidium gujava* belonging to the family Myrtaceae showed highest inhibitory effect of mycelial growth (89.56%) against the test pathogen. The next maximum inhibition was reported in *Saraca indica* of the family Caesalpiniaceae which was about 76.16 per cent. Other plant samples also showed significant mycelial inhibition against test pathogen. The inhibition of mycelial growth varies from family to family and species to species. Many plants are often seen disease free due to certain chemicals inside them which are enexhaustable source of environmentaly safe and biodegradable pesticide (Kubo & Nakanishi, 1979). We must not overlook the fact that practically all natural antimicrobial compounds are completely biodegradable

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without leaving any residue and thus limit pesticidal pollution (Beye 1978).

The ethanol extract of *Aloe spp*. was found to be most effective followed by chloroform, benzene and water extract against *Aspergillus niger, Cladosporium herbarum* and *Fusarium moniliforme* (Ali, et al. 1999). Kariba (2001) reported that the petroleum ether fraction of *Ajuga remota* was most effective against tested athogen.

In view of the above it may be concluded that many plants contain some fungitoxic compounds which inhibit the mycelial growth of fungus. Further studies are needed to isolate, purify and identify the active principle in promising plant extracts for commercial use in agriculture.

Table 1: Effect of different plant extracts on mycelial inhibition (%) of *Fusarium lycopersici*.

Name of the species	Family	Plant Part Used	Mycelial inhibition (%)
***Acacia arabica* Willd.**	Mimosaceae	Leaf	69.20 %
***Adhatoda vasica* Nees.**	Acanthaceae	Leaf	75.60 %
***Aegle marmelos* (Linn.) Corr.**	Rutaceae	Leaf	42.60 %
***Allium cepa* Linn.**	Liliaceae	Bulb	61.00 %
***Aloe barbadensis* Mill.**	Liliaceae	Leaf	75.90 %
***Azadirachta indica* A.Juss.**	Meliaceae	Leaf	73.84 %
***Boerhaavia diffusa* Linn.**	Nyctaginaceae	Root	28.90 %
***Calotropis procera* (Ait) R. Br.**	Asclepiadaceae	stem	24.20 %
***Cannabis sativa* Linn.**	Canabiaceae	Leaf	65.45 %
***Datura metel* Linn.**	Solanaceae	Fruit	45.76 %
***Evolvulus alsinoides* Linn.**	Convolvulaceae	Whole plant	32.00 %
***Ficus religiosa* Linn.**	Moraceae	Leaf	29.21 %
***Ipomoea cornea* Jacq.**	Convolvulaceae	Leaf	31.01 %
***Lantana camara* Linn.**	Verbenaceae	Flower	21.69 %
***Mentha spicata* Linn.**	Labiatae	Leaf	63.00 %
***Momordica charantia* Linn.**	Cucurbitaceae	Fruit	71.62 %
***Nepeta hindostana* (Roth.) Haines.**	Labiatae	Stem	32.16 %
***Nicotiana plumbaginifolia* Viv.**	Solanaceae	Leaf	40.10 %
***Nyctanthes arbor-tristis* Linn.**	Verbenaceae	Leaf	56.10 %
***Ocimum sanctum* Linn.**	Labiatae	Leaf	39.20 %
***Psidium guajava* Linn.**	Myrtaceae	Leaf	89.56 %
***Saraca indica* Linn.**	Caesalpiniaceae	Leaf	76.16 %
***Solanum nigrum* Linn.**	Solanaceae	Leaf	43.20 %
***Syzygium cumini (*Linn.) Skeels**	Myrtaceae	Leaf	59.21 %
***Terminalia arjuna* (Roxb. ex DC.) Wt. & Arn.**	Combretaceae	Fruit	41.25 %

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