



RESEARCH ARTICLE

Antifungal effect of three medicinal plant extracts against *Fusarium oxysporum* f.sp. *melongenae* causing wilt disease of Brinjal (*Solanum melongena* L.)

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Abstract

Wilt disease of brinjal caused by *Fusarium oxysporum* is one of the most destructive diseases of all brinjal growing areas. The present investigation was carried out to evaluate the efficacy of three antifungal plant extracts at different concentration to inhibited the pathogen in vitro. Among the plant tested, the aqueous extract of 15% of *Allamanda cathartica* (84 %), *Lantana camara* (52.2 %) and *Cassia alata* (41.4 %) inhibited the pathogen.

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Introduction

Brinjal plant (*Solanum melongena* L.) is affected by various diseases which causes significant reduction in yield. Among those diseases wilt of eggplant has been treated as one of the major constraints in eggplant cultivation in the country. It is caused by *Fusarium oxysporum* and one of the most important wilt diseases of brinjal in Assam. Wilt problems are especially severe in the humid tropics. *Fusarium oxysporum* was first described by Matuo and Ishigami during 1958 from Japan.

The wilt of brinjal is characterized by yellowing of foliage and then death of whole plant. High cost of chemical pesticides and their hazardous consequence use of biodegradable different material like fresh plant extracts gained importance during last three decades from plant disease control (Foweett and Spenser, 1970; Mitra et al., 1984; Grainge and Ahmed, 1988; Jespers and Ward, 1993). Several workers studied the control of *Fusarium* species on various plants extract (Fungal Wegrazyeke, 1984). EI. Shami et al; (1986). Reddy and Reddy, (1989); Patel (1989); Pandey et al., (1992). Therefore, the present study was conducted in order to find out the effect of aqueous extracts against the mycelia growth of *Fusarium oxysporum* causing wilt disease in brinjal.

Materials and Methods

The fungus *Fusarium oxysporum* isolated from the infected brinjal plants collected from Alopatis of Barpeta district (Assam) following tissue segmentation method. The pure culture was maintained in Potato Dextrose Agar slants at $4 \pm 1^\circ\text{C}$. Three plant extracts were tested for evaluating their inhibitory efficacy against *Fusarium oxysporum* under in vitro condition.

Invitro bio assay of Phytoextracts.

Aqueous extracts of the leaves of three local plants were tested for their antifungal property against *Fusarium oxysporum* by Poisoned Food Technique (Nene, 1971) under in vitro condition. Fresh leaves of test plants were taken for preparing crude extracts. They were thoroughly washed with water and fine slurry was prepared by taking 100g leaves with 100 ml of distilled water. The resultant slurry was filtered through muslin cloth and then through what man No. 1 filter paper and the extracts were used as stock

solution. From the stock solution different concentration of aqueous extracts like 5 ml, 10 ml and 15 ml was added with 95 ml, 90 ml and 85 ml of PDA media to make 5%, 10% and 15% concentrations respectively. The media was thoroughly shaken for uniform mixing of extract. 20 ml of media were poured into sterile petriplates. Mycelium of seven mm size discs from periphery of actively growing culture were cut out by sterile cork borer and one such disc was placed at the center of each agar plate. Petriplates contain only pathogen on PDA media served as control. The efficacy of plant product or botanicals was expressed as percent of radial growth over control, which was calculated by using the formula (Vincent, 1947).

$$I = \frac{C-T}{C} \times 100$$

Where, I = Percent inhibition over control

C = Radial growth in control

T = Radial growth in treatment

Results and Discussion

In the present investigation all the three botanical extracts significantly inhibited the mycelial growth of the test pathogen. Among them Allamanda extract was found most effective (84 %) followed by Lantana camara (52.2 %) and Cassia alata (41.4 %). (Table, 1. Fig.1).

It was observed that the maximum inhibition of the mycelial growth was found at highest concentration 15 % followed by 10 % and 5 %. There is significant difference among the three botanicals tried. The findings are in agreement with that of Meah et al., (2002) who reported that Allamanda leaf extracts showed significant result in controlling plant disease. Similar results were found by (Mdee et al., 2009;) using aqueous leaf extracts of Lantana camara against *Fusarium oxysporum*.

Table. 1 : In vitro evaluation of plant extracts against *Fusarium oxysporum* f.sp. melongenae.

S.L No.	Plant extracts	Percent inhibition of mycelial growth			
		Concentration (%)			Mean
		5	10	15	
1.	Allamanda cathertica L	55.6	71.1	84	70.2
2.	Cassia alata L.	28	35.1	41.4	34.8
3.	Lantana camara L.	42.2	46.6	52.2	47.0

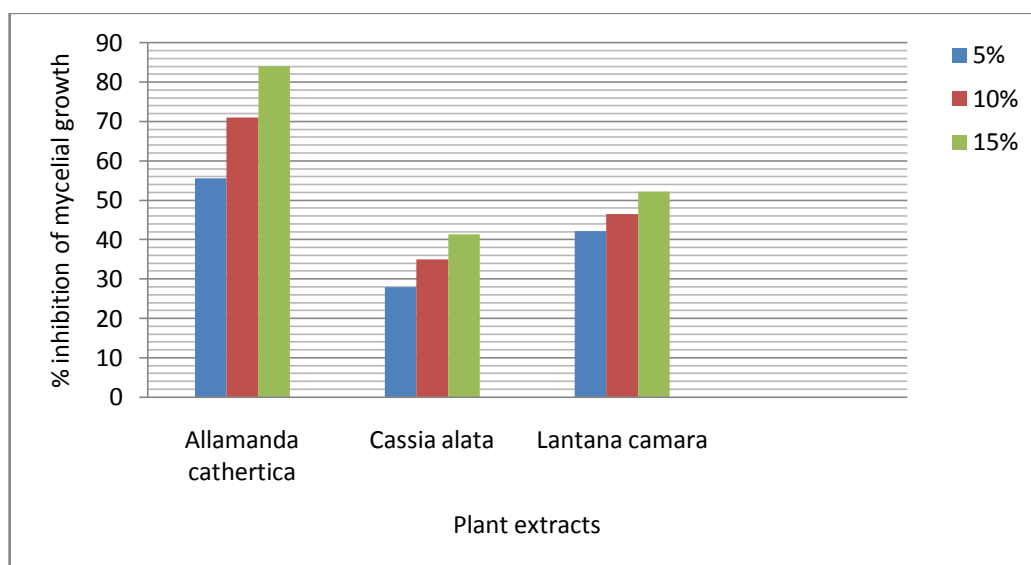


Fig. 1. In vitro evaluation of plant extracts against *Fusarium oxysporum* f.sp. melongenae.

Conclusion

It has been concluded from the present study that extracts of plant origin inhibited mycelial growth of *Fusarium oxysporum*. The in vitro control measures shown above may pave the way for utilizing plant extracts in management of diseases in field condition.

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