

## IN VITRO EFFICACY OF VITEX NEGUNDO LEAF EXTRACT ON THE GROWTH OF ALTERNARIA SOLANI

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The antifungal activity of *Vitex negundo* leaf extract was tested *in vitro* on *Alternaria solani*. Inhibition of mycelial growth varied with the concentration. The percentage of inhibition increased with increase in the concentration of extract. This demonstrates the presence of antifungal compounds in the plant.

**Keywords:** Concentration; Leaf extract; Percentage of inhibition; Test fungus.

Tomato is one of the important crops cultivated largely for the fruit vegetables. One of the common diseases occurring on the leaves and fruits is the early blight caused by fungal pathogen *Alternaria solani*. Various chemical fungicides are used to control this pathogen. Since these fungicides cause pollution to the environment and also kill beneficial organisms, research to explore the alternate sources of ecofriendly antifungal substances has been intensified. There has been considerable interest in exploring the antifungal potential of various plant products. Many plants are known to possess antifungal compounds that can be used to control various plant and human pathogens<sup>1-4</sup>. Some of these compounds are found to be organic chemicals of high structural diversity such as alkaloids, phenols, essential oils, terpenoids, flavonoids, tannins, the so called secondary metabolites having antimicrobial properties<sup>5</sup>. In recent years the plant extracts have been tested as promising biocontrol agents for control of pathogens by several workers<sup>6-14</sup>.

Fresh leaves of *Vitex negundo* were collected and washed thrice with the tap water and then air dried. These dried leaves were ground to get fine powder. 10 grams of powder was mixed in 100 ml sterile distilled water, boiled and filtered through double layered muslin cloth. The filtrate thus obtained was considered as 100% stock leaf extract. From this stock, different concentrations viz. 5%, 10%, 15%, 25%, 50%, 75% and 100% were prepared by proportionately adding sterile distilled water. The antifungal effect of the leaf extract was evaluated by poisoned food technique<sup>15</sup>. Each concentration of the extract was mixed aseptically with sterilized PDA medium (1:1 v / v) and poured in petriplates. The pathogen (test fungus) *Alternaria solani* was isolated from the infected tomato leaf and grown on the PDA medium in petriplate.

Mycelial discs of 1 cm diameter of the test fungus were taken out from the seven days old culture maintained

on PDA medium and inoculated on the solidified poisoned medium in each petriplate. The inoculated plates (in replicates) were kept for incubation at 27 ± 2 C. A set of control was also kept. On the 7th day and 9th day, diameter of the colony growth was measured in each petriplate and the percentage of inhibition of the fungal growth was calculated using the (Vincent's)<sup>16</sup> formula:

$$\text{Diameter of colony} - \frac{\text{Diameter of colony}}{\text{growth in control}} \times 100$$

Diameter of colony growth in control

The observations on the average growth diameter of the colony and the percentage of inhibition of the colony on the medium poisoned with different concentrations of leaf extracts of *Vitex negundo* on seventh and ninth day of inoculation of the test fungus *Alternaria solani* is presented in Table 1.

The leaf extracts of *Vitex negundo* inhibited the growth of test fungus. The percentage of inhibition increased with the increase in concentration of the leaf extract. Bhowmick and Choudhary<sup>6</sup> and Suresh and Nargund<sup>17</sup> made similar investigations on *Alternaria alternata* and *Alternaria helianthi* respectively. However with increase in the number of days of incubation, the inhibition potentiality of the extract seems to be decreasing.

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**Table 1.** Effect of *V. negundo* leaf extract on growth of *Alternaria solani* in vitro.

Plate	Concentration	Average diameter of the colony (in cms) on 7th day and % age of inhibition	Average diameter of the colony (in cms) on 9th day and % age of inhibition
Plant Extract	5	3.4(2.8)	4.3(2.2)
	10	3.1(11.4)	4.1(6.8)
	15	2.7(22.8)	3.8(13.6)
	25	2.3(34.2)	3.4(22.7)
	50	1.1(68.5)	2.2(50.0)
	75	0.8(77.1)	1.6(63.6)
	100	0.2(94.2)	1.0(77.2)
Control		3.5(00.0)	4.4(00.0)

Figures in parenthesis indicate percentage of inhibition.

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