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# Antifungal efficacy of leaf extract of *Vitex nigundo* L.on seed mycoflora of legumes

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**Abstract**: The seeds of legumes are associated with two dominant fungi *Aspergillus niger* and *Fusarium* solani.The leaf extract of *Vitex nigundo* L.shows fungitoxic property against these two fungi. With increasing concentration of *Vitex nigundo* there is decrease in linear growth of these dominant fungi.The percentage of seed mycoflora also get decreased due to application of leaf extract of *Vitex nigundo* L.

**Keywords**: Seed samples,seed mycoflora,agar media

## Introduction:

Seeds of legumes or pulses are having an important source of dietary proteins.The Vegetarian population of India need important aminoacids in their diet.This requirement was fulfilled by legumes and pulses.There are major pulse crops like green gram,black gram and Bengal gram the seeds of which are found to be responsible for disease transmission because they carry number of pathogens which get associated either in the field or in the post harvest condition.(1-4).

Among different types of seed mycofloras,the two types of fungi were observed namely *Aspergillus niger* and *Fusarium solani.*The medicinal plant *Vitex nigundo* L.has an antifungal activity.In present investigation these seed borne fungi were controlled by using leaf extract of *Vitex nigundo.*Here an attempt has made to know the effect of leaf extract of *Vitex nigundo* on two types of fungi.(5-7).

## Materials and methods:

1) Collection of seed samples:The seed samples of Bengal gram,Green gram and Black gram were collected from Agriculture Research centre of Latur.
2) Assessment of seed mycoflora: By using Agar plate and Blotter paper method as recommended by ISTA the seed borne fungi of pulse seeds were detected.
   a)Agar plate method: At first glucose nitrate agar medium was prepared.Nine petriplates were taken for each seed sample.Then GNA medium and petriplates were sterilized in autoclave.After sterilization the medium was allowed to solidify.Then the seeds were treated with 0.1% of $Hgcl_2$ for two minutes.The removal of excess $Hgcl_2$ was made by washing the seeds with sterilized petriplates.After that these petriplates were incubated in incubating chamber for 8 days.Then the plates were examined after 8 days and noted the characteristics of fungal colonies associated with each seed.Prepared the

slides and examined them under microscope.The percentage of infection of different fungi was recorded and observed the changes taking place in infection of seeds.

b)Blotter paper method: Taken nine petriplates and nine blotters.Written sample number and data with marker pen.Dipped them in sterilized water.Blotters were kept in vertical position till the removal of excess water.Then the blotters were placed in the sterilized petriplates.The seeds were treated with 0.1% $Hgcl_2$ for 2 minutes.Then taken 10 seeds at random with the help of forcep.Placed 10 seeds at equal distance on the moist blotter.Written samples name on dish using marker pen.In such a manner prepared nine plates with each having 10 seeds of each sample.After that these petriplates were kept for one week at above $25^0$c temperature in an incubating chamber.

3) Selection of medicinal plant: Medicinal plants have been used as biocontrol agent to control the plant pathogenic fungi.The medicinal plant *Vitex nigundo* L.is selected to control the growth of *Aspergillus niger* and *Fusarium solani.*

**Observation Table No.1:**Effect of *Vitex nigundo* L.on linear growth of *Aspergillus niger*.

| Sr. No. | Leaf Extract Conc. (%) | Linear growth(mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Incubation period (Days) | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 1.0 | 7.00 | 12.50 | 15.00 | 22.00 | 30.00 | 41.50 | 48.00 | 53.00 |
| 2 | 2.0 | 5.00 | 11.00 | 13.00 | 20.00 | 26.00 | 38.50 | 44.00 | 47.00 |
| 3 | 3.0 | 4.00 | 10.00 | 11.50 | 18.00 | 22.00 | 26.00 | 32.00 | 25.00 |
| 4 | 4.0 | 0.00 | 0.00 | 0.00 | 3.00 | 4.00 | 6.00 | 7.00 | 8.00 |
| 5 | 5.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | Control | 18.00 | 22.00 | 26.00 | 32.00 | 40.00 | 48.00 | 62.00 | 70.00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7 | S.E.± | 3.20 | 4.22 | 4.65 | 6.20 | 7.22 | 9.40 | 11.20 | 13.85 |
| 8 | C.D.at P=0.01 | 25.22 | 33.45 | 40.21 | 60.41 | 70.84 | 90.14 | 102.98 | 112.32 |
| 9 | C.D.at P=0.05 | 16.22 | 22.26 | 26.22 | 39.40 | 42.86 | 60.28 | 68.42 | 76.41 |

**Observation Table No.2**: Effect of *Vitex nigundo* L.leaf extract on linear growth of *Fusarium solani*

| Sr. No. | Leaf extract Conc.(%) | Linear growth (mm) Incubation period (Days) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 1.0 | 8.00 | 13.00 | 19.00 | 22.00 | 32.00 | 36.50 | 42.50 | 48.00 |
| 2 | 2.0 | 7.00 | 12.00 | 17.00 | 20.00 | 28.00 | 33.50 | 38.00 | 43.00 |
| 3 | 3.0 | 6.00 | 10.00 | 15.00 | 18.00 | 24.00 | 30.00 | 33.50 | 40.00 |
| 4 | 4.0 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 12.00 | 13.50 | 17.00 |
| 5 | 5.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | Control | 18.00 | 20.00 | 23.00 | 29.00 | 38.00 | 48.00 | 62.00 | 70.00 |
| 7 | S.E.± | 3.82 | 4.52 | 5.54 | 6.20 | 8.34 | 11.63 | 13.15 | 15.22 |
| 8 | C.D. at P=0.01 | 31.44 | 37.52 | 44.06 | 56.22 | 74.26 | 92.42 | 109.44 | 128.15 |
| 9 | C.D. at P=0.05 | 20.07 | 24.28 | 30.18 | 36.22 | 49.52 | 63.18 | 70.25 | 84.23 |

**Results and Discussion**:

The bioefficacy of leaf extract of *Vitex nigundo* on seed mycoflora was observed.The results were noted in table 1 and 2.From the results it was clear that with increasing concentration of *Vitex nigundo* there was decrease in mycelial growth of *Aspergillus niger*.It was 8mm on 8$^{th}$day of incubation at 4% concentration of *Vitex nigundo* leaf extract showing the maximum inhibition while the growth of *Aspergillus niger* on contrl plate on 8$^{th}$day of incubation was 70mm.At 1.0% it was 53.00,mm,at 2.0% it was 47.00mm and at 3.0% it was 25.00mm This indicates that at 5.0% concentration,there was complete inihibition of the fungus.

Results depicted in table 2 indicated that linear growth of Fusarium solani was 17mm on 8$^{th}$day of incubation when treatment of Vitex nigundo was given at 4.0% concentration showing the maximum inhibition.On the other hand,the growth of *Fusarium solani* on control plate was 70mm on 8$^{th}$day of incubation.At 1.0% it was 48.00mm,at 2.0% it was 43.00mm,at 3.0% it was 40.00mm and at 4.0% it was 17 mm while at 5.0% it was 00mm from 1$^{st}$ to 8$^{th}$day of incubation.This means that at 5.0% concentration there was complete inhibition of fungus.

**Conclusion:**

In the summary I conclude that as the concentration of *Vitex nigundo* increases,there was decrease in linear growth of *Aspergillus niger* and *Fusarium solani.*

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