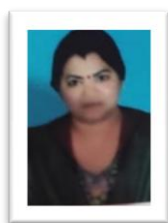


# In Vitro Evaluation of Fungistatic effect of Root Extracts of Plants on Colletotrichum Capsici causing Anthracnose of Urdbean

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### Abstract

Root extracts of eight angiospermic plants were evaluated in vitro against mycelial growth of *Colletotrichum capsici*, causing anthracnose of urdbean. Maximum inhibitory effect was exhibited by 5% extracts of *Aerva lanata*, *Datura metel*, *Ocimum sanctum* and *Eclipta erecta*. The root extracts of *Achyranthes aspera*, *Parthenium hysterophorus* and *Phyllanthus niruri* were poorly active whereas extract of *Ipomoea cornea* did not show any activity against the pathogen.

**Keywords:** *Colletotrichum Capsici*, Culture media, Antifungal activity

### Introduction

In India, anthracnose of urdbean is an economically important disease which affects urdbean cultivation. It is caused by many species of fungal genus *Colletotrichum* of which *C. capsici* crop up widely. *C. capsici* has been reported to cause anthracnose disease in many other countries (Ratanacherdchal et al. 2010). The disease is caused at any stage of plant growth, but flowering stage is most susceptible. In present day agriculture, farmers use integrated crop production strategies involving various inputs, practices and means of managing biotic and abiotic stresses. However, uses of chemicals dominate all other inputs thus leads to degradation of the environment, development of fungicidal resistance along with their harmful effects on human beings and beneficial organisms. So use of non chemical ecofriendly means of control i.e. biopesticides has emerged as a viable alternative under such conditions (Padder, 2010). Many plants possess antimicrobial properties (Genesan, 2000) Literature however shows majority of work done on only leaf extracts of plants on diseases inducing anthracnoses. (Misra et al. 2011, Subhashini 2012, Geat and Khirbat 2015). Present paper deals with the effect of root extracts of angiospermic plants on the growth of pathogen *C. capsici* in vitro

### Objective of the Study

Aims and objective of present investigation is to assess the use of non-chemical, ecofriendly means of control (i.e., biopesticides) in controlling anthracnose disease of urdbean which is one of the economically important crops of the India. Investigations has been carried out in vitro to find out the effect of roots extracts of various angiospermic plants on growth of pathogen (*Colletotrichum capsici*) causing anthracnose disease of Urdbean.

### Material and Method

Root extracts of eight mildly growing angiospermic herbs were used. 20 gram fresh roots were dug out from the soil and washed with distilled water and washed with 20 ml sterile distilled water. It was then filtered through muslin and finally through whatman filter paper no.42. This was treated as 100% standard solution which was further distilled to 5%. One ml of extract mixed with 20 ml sterilized PDA medium were seeded in petridishes and inoculated with 5mm culture disc of 10 days old sporulating culture of *Colletotrichum capsici*, isolated for diseased leaves of Urdbean. Petridishes were incubated at  $30 \pm 1^\circ\text{C}$  for 7 days after which radial growth was measured along two axis in petridish at right angles to each other. The experiment was performed in triplicate.

### Results and Discussion

Inhibition of mycelial growth of *C. capsici* by 5% water extract of roots of eight angiospermic herbs has been given in table 1. It was

revealed that the extracts of *Aerva lanata*, *Datura metel*, *Ocimum sanctum* and *Eclipta erecta* were more active (20-30%) in inhibiting mycelial growth of the pathogen in comparison to control. Maximum inhibition of 32.57% was however exhibited by *D. metel* followed by 27.44% exhibition by *O. sanctum*. Root extracts of *A. lanata* and *E. erecta* were statically at par with each other and the variations in them were insignificant. Root extracts of *Achyranthes aspera*, *Parthenium hysterophorus* and *Phyllanthus niruri* were poorly active against the pathogen. *Ipomoea cornea* did not possess any antifungal activity.

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*C. capsici* treated with *Datura metel* showed hyphal thickenings and swellings at the tip of hyphal strands. This was supported by Sariah (1995) and Kumaran et al. (2003) in case of *C.capsici* and they suggested that this was due to the Fungitoxic compounds present in the extract. Similar results were obtained by Geat and Khirbat (2015) by plant extracts on *C. capsici*. Misra et al (2011) were able to arrest the growth of *C. capsici* with the help of variety of plant extracts.

**Table 1: Effect of root extracts of plants on mycelial growth of *Colletotrichum capsici***

Plant Species	Mycelial growth	
	Radial growth (Mm)	Inhibition over control (Percent)
<i>Aerva lanata</i>	68.66	20.67
<i>Achyranthes aspera</i>	84.93	1.88
<i>Datura metel</i>	58.36	58.36
<i>Eclipta erecta</i>	68.00	21.44
<i>Ipomoea cornea</i>	86.56	00.00
<i>Ocimum sanctum</i>	62.80	27.44
<i>Parthenium hysterophorus</i>	84.46	2.42
<i>Phyllanthus niruri</i>	78.53	9.27
Control	86.56	00.00
SEm ±	1.90	
CD (P=0.05)	4.58	

Disease control through the use of plants has been explored in recent years due to their antifungal properties and easy decomposition so as not to create pollutional problems. Many studies have been conducted using plant extracts to control *Colletotrichum* sp. (Johnny et al, 2011).

#### Conclusion

In India, Anthracnose disease of Urdbean is an economically important disease which effects Urdbean cultivation. Disease is caused by many species of fungal genus *Colletotrichum* of which *C.capsici* crop up widely. In present investigation root extracts (5%) of eight angiospermic plants were evaluated in vitro against mycelial growth of *Colletotrichum C. capsici*. Maximum inhibitory effect was exhibited by extracts of *Aerva lanata*, *Datura metel*, *Ocimum sanctum* and *Eclipta erecta* while extracts of *Achyranthes aspera*, *Parthenium hysterophorus* and *Phyllanthus niruri* were found poorly active against the pathogens. *Ipomoea cornea* did not show any activity against the pathogen.

Disease control through the use of plants (as non chemical bio fungicides) has been new exploration in recent years due to their antifungal properties and easy decomposition without creating any pollution problems and degradation of the environment.

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