



Short Communication

Studies on Antimicrobial activity of Medicinal plants against Seed-borne Pathogenic Fungi

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Abstract

Many medicinal plants used for several years to control the plant diseases. Various medicinal plants are found promising against several seed borne fungi. In vitro studies were done by agar well method to evaluate antifungal activity of plant extracts. Six different plants were used to study antifungal activity against five different seed borne pathogenic fungi like *Rhizopus stolonifer*, *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger* and *Fusarium oxysporum* among these six medicinal plants four plants showed antifungal activity. *Azadirachta indica* showed highest activity and *Capsium annum* showed least activity against seed borne pathogenic fungi in vitro. From above result it is clear that these medicinal plants were used as antifungal agent for management of seed borne diseases.

Keywords: Antimicrobial, Medicinal plants, Seed borne fungi.

Introduction

The fungi are considered as main causal organisms for the disease production in plants and can loss maximum. Different species of *Alternaria*, *Aspergillus*, *Cercospora*, *Ceratobasidium*, *Trichoderma*, *Cephalosporium* and other fungi are most common. Seedling damage and in storage condition with quality loss and the value of nutrition¹. In national and international trade seeds are distributed widely along with germplasm under breeding programmes. Indiscriminate use of chemical pesticide all over the world deteriorated the soil mycoflora and damaged our environment beyond repairs from last four decades. Reckless use of non-target pesticides to kill the pest, we lost of biodiversity and disturbed our ecosystem.

Discovery of novel antimicrobials compound as a biopesticide and such biopesticide activity has been explored which are easily biodegradable, which can be locally produced for farmers who cannot afford expensive synthetic pesticides. From ancient times medicinal plants were used against various diseases and found effective also. Biopesticides are used and made available to the farmers which are easily degraded and cheap. From long time farmers use medicinal plant extracts to the purpose of diseases eradication. Plant produces several kinds of biochemical which effective against many plant diseases². Many plants contain essential secondary metabolites which used for medicinal purposes for several years³. India like countries which rely on such medicinal plants to combat the plant diseases. The management of fungal pathogens during seed borne phases is considered to be the cheapest disease control strategy⁴. The

synthetic fungicide are toxic to plant as well as food chain and there should be a bioaccumulation and bio-magnification process so, we must focus an eco-friendly and effective methods to control plant diseases by employing the medicinal plants⁵. Many locally available plants are rich source of novel bio-compounds which are cheapest source. Screening, isolation and studying the antifungal effect of such biochemical is needed to control diseases⁶. Hence in vitro antifungal effect of some medicinal plants is undertaken.

Materials and Methods

Collection of material: The plants were collected from Udgir Dist. Latur. Plants such as *Annona squamosa* L., *Azadirachta indica* A. Juss., *Butea monosperma* (Lamk) Taub., *Datura innoxia* Mill., *Lantana camara* L. The collected samples were stored and used for further study.

Preparation of Plant Extracts: Study of Antifungal activity, Leaf extract of five different medicinal plants was used. The collected leaf samples sterilized with 0.1% HgCl₂ then wash with sterile D.W. Sterilized leaves were crushed in mortar and pestle and prepared leaf extract with 10ml distilled water.

Screening for Antifungal Activity: Sterilized PDA is prepared and sterilized petriplate of PDA were streaked by fungi. In the center of agar medium well cavity of 6mm diameter was made and filled 2ml of each leaf extract. Incubation was done at 28°C for 48-72 hours⁷. The inhibitory zone of fungi in mm was observed. The observation was made in triplicate and mean is taken for consideration.

Table-1
Antimicrobial activity of some medicinal plant

Medicinal Plant	Zone of inhibitions (diameter in mm)					Mean
	<i>Alternaria alternata</i>	<i>Aspergillus flavus</i>	<i>Aspergillus niger</i>	<i>Fusarium oxysporium</i>	<i>Rhizopus stolonifer</i>	
<i>Annona squamos</i> L.	-----	----	----	----	----	----
<i>Azadirachta indica</i> A. Juss.	22.5	22.66	23.33	22.5	21.9	22.57
<i>Butea monosperma</i> (Lamk) Taub.	-----	----	----	----	----	----
<i>Datura inoxia</i> Mill.	19.5	20.0	20.66	18.5	19.66	19.66
<i>Lantana camera</i> L.	20.33	19.66	22.0	20.5	20.66	20.63
<i>Capsicum annum</i> L.	15.33	16.0	14.33	17,5	16.33	15.88

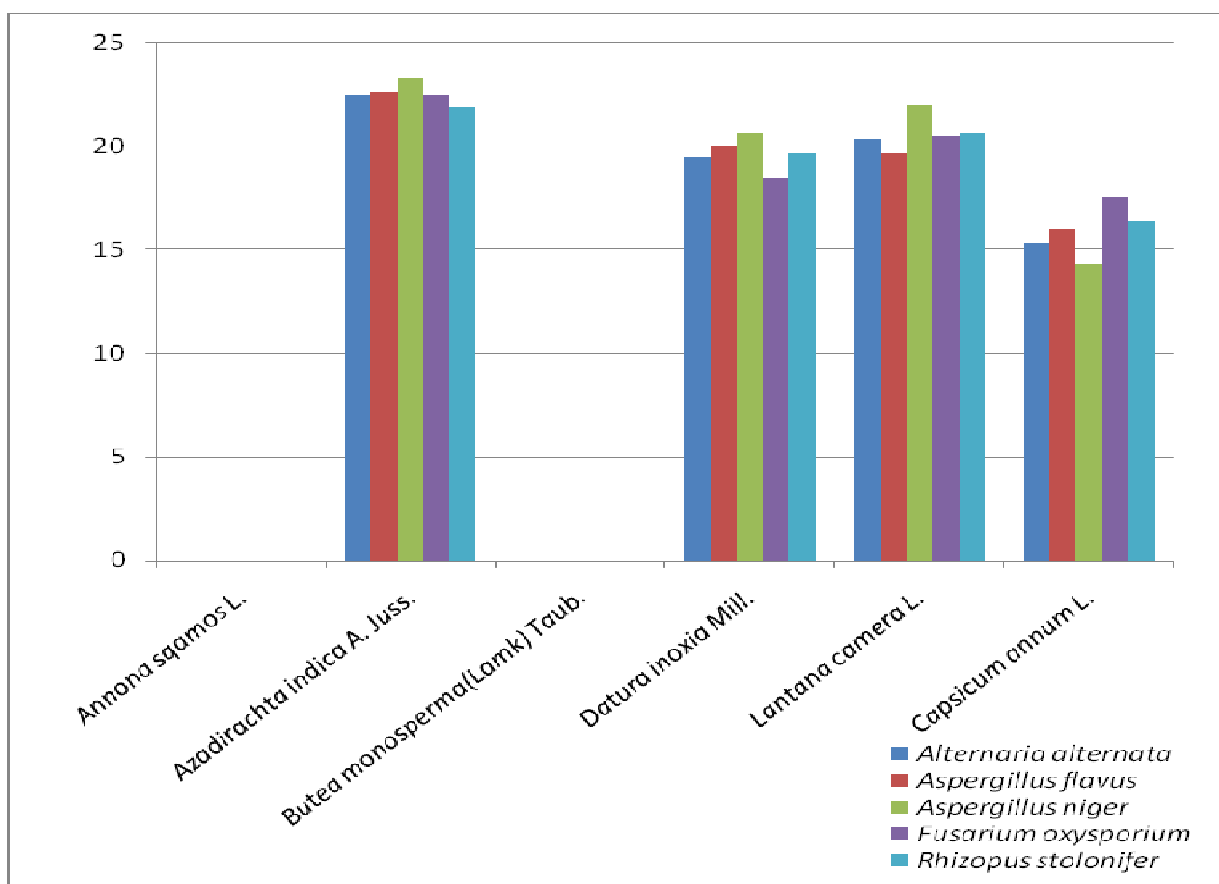


Figure-1
Antimicrobial activity of some medicinal plant

Results and Discussion

In the present study the antifungal properties of six leaf extracts against five seed borne fungi were studied. In vitro studies also showed that plant like *Azadirachta indica* A.Juss. (Zone of inhibition 22.57 mm), *Lantana camera* L. (Zone of inhibition

20.63 mm), *Datura inoxia* Mill. and *Capsicum annum* L. show less activity. The leaf extracts of *Annona squamosa* L. and *Butea monosperma* (Lamk) Taub. show minimal inhibition against *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger*, *Fusarium oxysporium*, *Rhizopus stolonifer* fungi.

As compared to synthetic fungicides, plant origin secondary metabolites found to be more effective against pathogens and it has high biodegradability which has less environmental hazards. The search towards the natural phytochemicals as antimicrobial that are attaining very importance as antifungal substances. Further biochemical investigations of the plants need to be done for the active principles in the plants

Conclusion

The present study revealed that the leaf extract of *Azadirachta indica* A.Juss. showed promising antifungal activity against *Rhizopus stolonifer*, *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger* and *Fusarium oxysporium* fungi. Present study leads to discover novel antifungal compounds.

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