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ANTIFUNGAL PROPERTIES OF BUCHANANIA LANZAN ESSENTIAL OIL AGAINST GROUNDNUT SEED MYCOFLORA

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ABSTRACT

The increased use of pesticides in the field of agriculture has become major source of environmental pollution affecting the ecosystem; consumption of organomercurial fungicides which are primarily used for seed treatment is gradually increasing. A wide variety of fungicides used for seed treatment are being produced in India. These include organomurcurial, thiram, mancozeb etc. These fungicides applied to crop are long lived and residues persist in soil causing pollution. In the present studies evaluation of essential oil from seeds of *Buchanania lanzan* was used for groundnut seed treatment which showed maximum efficacy against seed mycoflora. The essential oil inhibited the seed mycoflora to greater extent with respect to fungi like *Alternaria, Fusarium, Rhizopus, and Curvularia*. *Buchanania lanzan* seeds contain a variety of essential oils and antifungal components like camphene, a-pinene, y-terpinene, b-pinene, myrcene, 8-cineole, sabinene and triglycerides like triolein, dipalmitoolein and dioleopalmitin which may be responsible for antifungal activity. Among different concentrations of essential oil tested, 3% extract showed maximum inhibition of phytopathogenic fungi. Thus, the use of plant based biopesticides, which are target oriented and biodegradable is now essential to control plants diseases and for sustainable agriculture.

KEYWORDS: Antifungal, Mycoflora and *Buchanania lanzan.*

INTRODUCTION

The indiscriminate use of pesticides all over the world in general and India particular has badly damaged our environment for the last forty years. Use of non-target pesticides has caused severe damage to our biodiversity and damage to soil Microflora. This ultimately

affected the fertility of soil, moreover the use of bulk pesticides and chemical fertilizers have polluted our Environment beyond repair.

Time has come to avoid the use of fungicides and opt for control of diseases by biological control and by the use of biopesticides, which are target oriented and biodegradable. Hence, in view of the alarming present situation we need to embrace alternative natural therapy for controlling the cop diseases. Use of essential oils from plants would be an alternative therefore studies focused on evaluation of oil from *Buchanania lanzan* charoli (or chironji) showing inhibitory effect against (fungi) seed mycoflora is undertaken.

MATERIALS AND METHODS

The ripe fruits of *Buchanania lanzan* were collected from Udgir area of Latur District (MS). The seeds of plant were subjected to soxhlet extraction separately and successfully with methanol (50˚–85˚ C). The fractions obtained were evaporated and essential oil was obtained. Which are preserved in suitable glass vials at room temperature.

In order to study the seed mycoflora the cultivar seed samples were obtained from authentic sources like oil seed research station, Latur. Surface and internal mycoflora of different groundnut varieties was worked out. The pathogenic fungi after isolation were cultured for their sensitivity tests towards essential oil of *Buchanania lanzan.*

100 seeds were taken randomly in a plastic pouch and the essential oil was added. In this case of seed treatment the concentration of oil was adjusted to 1% (w/w). During the process of seed treatment seed were thoroughly agitated with oil taken in plastic pouch. Such treated seeds were then plated equidistantly on three layers of wet blotters in Petridishes and then the plates were incubated for a period of 1 week as per the standard condition of ISTA.

For evaluating antifungal efficacy of essential oil under study, disc diffusion method was adopted (Bauer *et al*, 1966). For this sterilized blank whatman filter paper discs were used. The discs were impregnated with essential oil and kept in slanted position so as to drain off excess oil.

For sensitivity testing PDA plates were seeded with each isolated plant pathogenic fungi and oil impregnated paper disc was placed on it in the center aseptically. All the plates were then incubated at 37˚ C for 5 days. After incubation results were noted by measuring zone of growth inhibition in mm and average value was calculated for each fungus.

RESULT AND DISCUSSION

These days an alternative to synthetic fungicides products of Botanical origin are being used to prevent fungal diseases in crop plants. Large number of plants contained essential oils which are known to be antifungal in nature. In the present study while evaluating the efficacy of essential oil from *Buchanania lanzan* against seed mycoflora, in general it was observed that the antifungal efficacy of essential oil was effective against *Curvularia, Fusarium, Alternaria, Aspergillus niger, Aspergillus flavous, Penicillium* etc. (Table I).

The inhibitory effect of essential oil from *Buchanania lanzan* against fungi isolated were studied individually (Table II).

Table: I Effect of essential oil on seed mycoflora of groundnut

Mycoflora	**% Occurrence of Fungi due to essential oil Treatment on Groundnut**	
	C	**T**
Aspergillus niger	50	02
Aspergillus flavous	20	05
Alternaria Sps.	27	---
Curvularia Sps.	10	---
Fusarium Sps.	30	---
Penicillium Sps.	40	10
Rhizopus Sps.	60	---

C – Control **T** – Treated

Essential oil used in general inhibited the seed mycoflora to a greater extent with respect to Fungi like *Alternaria Sps., Curvularia Sps., Fusarium Sps., Rhizopus Sps.* Storage fungi like *Aspergilli* and *Penicillia* also were inhibited to greater extent. The biopesticide int eh form of assential oil obtained from *Buchanania lanzan* L. shows its exceptional efficacy as an effective inhibitor against the pathogenic agents like *Alternaria Sps., Curvularia Sps., Fusarium Sps., Rhizopus Sps., Aspergilli* and *Penicillia*.

Table: II Antifungal effect of essential oil against plant pathogenic fungi

Essential oil	**Average value of zone of inhibition in mm against fungi**				
	Aspergillus	***Penicillium***	***Rhizopus***	***Fusarium***	***Alternaria***
Buchanania lanzan	29	36	34	28	40

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