

UTILIZATION OF LEAF EXTRACTS OF *Azadiracta indica* A.Juss. AND *Trigonella-foenum gracium* L. TO CONTROL SEED BORNE PATHOGEN OF GROUNDNUT CULTIVERS.

Jogdand S.K.

P.G.Dept.of Botany,

Mrs.K.S.K.College Beed. (M.S)

ABSTRACT

The present study deals with the effect of different leaf extract to control the seed borne pathogens were evaluated. The seed treatments improved seed germination, vigour index and reduced seed borne pathogens of Ground nut seeds. A total 12 fungal species were isolated from groundnut seeds collected from local market Beed city from Maharashtra. A isolated fungi were identified as *Aspergillus flavus* , *Aspergillus niger* , *Penicillium sp.*, *Rhizoctonia solani* , *Fusarium oxysporum* , *Fusarium semitectum* , *Fusarium solani* , *Cladosporium sp.* *Mucor sp.* , *Curvularia lunata* , *Verticillium sp.*, and *Trichoderma viridae*. *Aspergillus flavus* , *Rhizoctonia solani* and *Fusarium solani* were observed dominant pathogen on treated and untreated seeds of ground nut. It was effectively controlled by the treatment of leaf extract of *Azadiracta indica* A.Juss.and *Trigonella foenum –gracuum* L

KEY WORDS

Pathogen ,leaf extract, local market , treatment

INTRODUCTION

Groundnut (*Arachis hypogea* L.) is a valuable legume crop is also known as peanut .It is annual,wet season plant grown in many tropical and temperate countries of the world .Ground nut seeds contain 50% of edible oil . Seeds are rich in fats,protein ,vitamin B1, B2,B6 and nicotinic acid. It is also good source of lecithin present to the extent of 0.5-0.7% in decorticated nuts. Groundnut flour is suitable for supplementing wheat flour (Sastri, 1948), various diseases caused by organisms *Fusarium solani*. Damping off of Ground nut seedlings is caused by *Fusarium oxysporum*(Reddy and Rao,1980).*Aspergillus* attacks germinating ground nut seed (Clinton,1960) .*A.niger* caused crown root *disease* of peanut (Gibson,1953) . Many workers have detected mold fungi and their toxin production ability in stored products (Afzal et al.,1979)

However the average Indian farmer cannot afford the increasing cost of synthetic chemicals. Furthermore, the use of fungicides has of late resulted in the buildup of toxic chemicals potentially hazardous to mankind and environment and also in the buildup of resistance by pathogens (Sinclair ,1971).

Therefore, the development of bio-pesticides has been focused as a viable pest control practice in recent years. Plants are one of the source of potential new pesticides is natural products .Plant extracts and essential oils show antifungal activity against a wide range of fungi (Grane and Ahmad,1988 ,Abd –Alla et al,2001).In the present study the antifungal activity of leaf extract of these four plants against *Collototrichum distructichum* was investigated recently by the Alkhali (2005) . The development of bio-pesticides has focused as a viable pest control strategy now a days. The present study is carried out in order to find out the effect of plant extracts, bio-agents on seed pathogens of Groundnut seeds.

MATERIAL AND METHODS

Plant extract for seed treatment: The seeds of four groundnut varieties viz. Gujrat, Western, Ghungroo and Local were collected from the different market places of Beed city (M.S) for the isolation of seed mycoflora associated with groundnut seed sample. Method was adopted which was recommended by ISTA (1966). Plant materials such as fresh leaves of *Azadirachta indica* and *Trigonella foenum-gracium* are collected and thoroughly washed in tap water. 100 gms of leaves of both plants were macerated to thick paste with the help of mortar and pestle. It was extracted with 100ml of distilled water and filtered through muslin cloth. The supernatant obtained was collected and stored for further use. The plant extracts poisoned food technique was applied (Nene and Thapilyal, 2000) 10% concentration plant extracts was used separately.

Seed treatment with plant extract: Four varieties of Groundnut *Arachis hypogea* L seeds were collected and experiment was conducted during the month of Nov. 2018. Firstly the seeds were sterilized with 0.1% HgCl₂ for three minutes for surface sterilization while for .rinsed thoroughly in distilled water and dried aseptically. The seeds were treated with plant extract of *Azadirachta indica* and *Trigonella foenum-gracium* separately by soaking seeds in it. Untreated seeds served as control. There were three replicates of each treatment.

Isolation and identification of seed-borne pathogens: Fungi were isolated from Groundnut seeds by using ISTA (2003) slanted blotter paper method. 100 seeds each from each treatment were plated in two layers of well moistened blotter by soaking 1% sodium hypo chloride solution for 2 min and washed with sterile water. The seeded plates were incubated at +/- 28°C. The seeds were examined under a stereoscopic binocular microscope for mycoflora. Subcultures were made on fresh PDA emerging on blotter paper and Agar plates for proper identification and pathological tests.

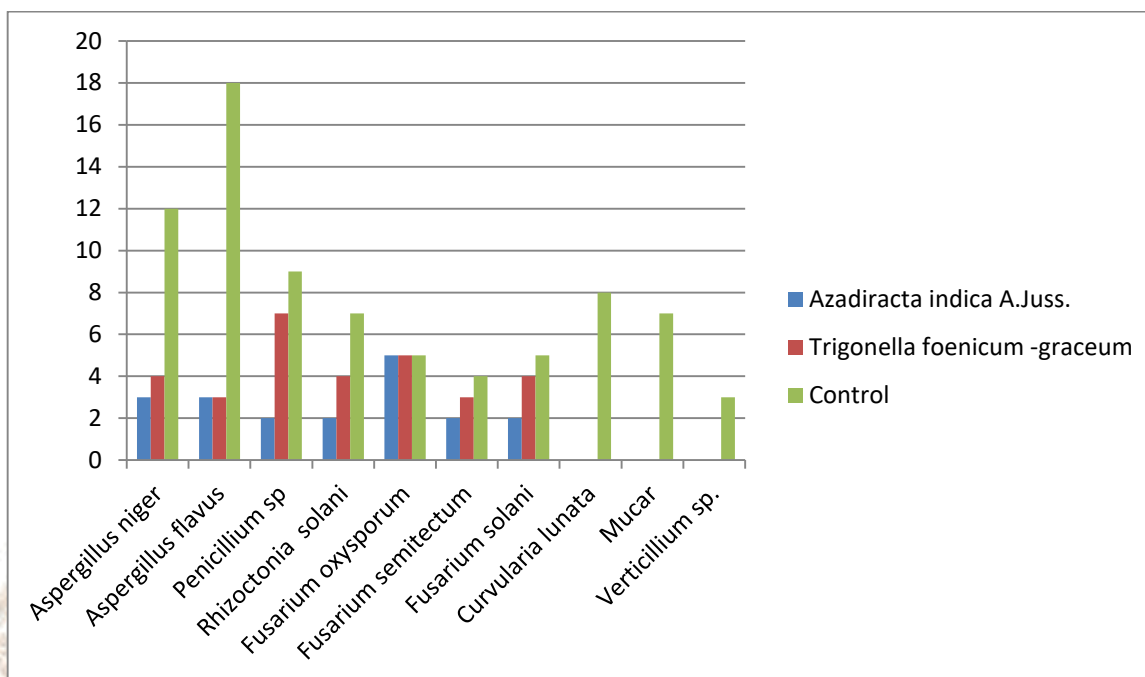
RESULTS AND DISCUSSION

Effect of leaf extracts on seed pathogens was evaluated. Groundnut seed mycoflora showed variations in their composition depending on the treatments (Table 1). In blotter paper method total 12 fungi were isolated with the seeds of Groundnut. Isolated fungi were as *Aspergillus flavus*, *Aspergillus niger*, *Penicillium sp.*, *Rhizoctonia solani*, *Fusarium oxysporum*, *Fusarium semitectum*, *Fusarium solani*, *Cladosporium sp.*, *Mucor sp.*, *Curvularia lunata*, *Verticillium sp.*, and *Trichoderma viridae*. *Aspergillus flavus*, *Rhizoctonia solani* and *Fusarium solani* were observed dominant pathogen on treated and untreated seeds of groundnut. It was effectively controlled by the treatment of leaf extract of *Azadirachta indica* A. Juss. and *Trigonella foenum-gracium* L. Untreated seeds recorded the highest seed mycoflora percentage 70%.

Sr.no	Name of the fungi/Percent incidence of Mycoflora	Treatment of the Plant extract		Control
		<i>Azadirachta indica</i> A. Juss.	<i>Trigonella foenicum</i> - <i>graceum</i>	
1	<i>Aspergillus niger</i>	03	04	12
2	<i>Aspergillus flavus</i>	03	03	18
3	<i>Penicillium sp</i>	02	07	09
4	<i>Rhizoctonia solani</i>	02	04	07
5	<i>Fusarium oxysporum</i>	05	05	05
6	<i>Fusarium semitectum</i>	02	03	04
7	<i>Fusarium solani</i>	02	04	05

8	<i>Curvularia lunata</i>	-	-	08
9	<i>Mucar</i>	-	-	07
11	<i>Verticillium sp.</i>	-	-	03
Total		19	26	78

Table 1. Effect of aqueous medicinal leaf extracts on incidence of seed mycoflora on Groundnut seed



Effect of aqueous medicinal leaf extracts on incidence of seed mycoflora on Groundnut seed

Effect of medicinal plant extracts on seed mycoflora of Groundnut was evaluated. Seed borne mycoflora of Groundnut showed variations in their occurrence depending on the treatments. Total 10 fungi were isolated by the Blotter paper method (Table 1.) These isolated fungi were identified as *Aspergillus niger*, *Aspergillus flavus*, *Penicillium sp.*, *Rhizoctonia solani*, *Fusarium oxysporum*, *Fusarium semitectum*, *Fusarium solani*, *Curvularia lunata*, *Mucar*, and *Verticillium sp.* Were the dominant fungi observed on untreated seeds of Groundnut. The number of fungi were reduced in the treatment given of leaf extract of medicinal plants namely *Azadiracta indica* leaf extract followed by the *Trigonell foenum gracium* leaf extract. The minimum number of fungi observed with the *Azadiracta indica* leaf extract. These results are in support of the Jeylakshmi et.al (1998) who reported the biological control potential of *T.harzianum*. Thus (Elad et.al.,1982;Aziz etal., 1993; Baker and Dickman.,1993;Sivakumar and Narayanswamy,1998),concluded that number of plant extracts are reported to decrease the incidence of pathogens. (Bansal and Gupta2000). Bunker and Mathur (2000)also reported the similar observations.

Thus the present investigation highlights the importance of seed treatments with medicinal plant leaf extracts in reduction of incidence of seed mycoflora of Groundnut. It was noticed that the treated seeds with aqueous leaf extract of medicinal plants decreases the incidence of seed borne mycoflora. It is ecofriendly and not polluted our planet.

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