



Biological Control of Seed Borne Fungi of Groundnut

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ABSTRACT

Seed of Groundnut are associated with number of fungi including *A. flavus*, *A. niger*, *Fusarium moniliforme*, *Rhizoctonia bataticola*, *Curvularia lunata* and *Rhizopus nigricans*. The seed were treated with aqueous extract, alcoholic extract and ethyl acetate extract of *Azadirachta indica* A. Juss leaves for 5 minutes, 15 minutes and 30 minutes. It is evident that the treatment of ethyl acetate extract for 30 minutes inhibited the growth of dominant fungi like *Curvularia lunata* A. *flavus*, *A. niger* and *Fusarium moniliforme*, so the ethyl acetate extract of leaves of *Azadirachta indica* A. Juss. can be utilized for the biological control of seed borne fungi of Groundnut.

Key words : Biological control, Groundnut seeds, seed mycoflora, *Azadirachta indica* .

INTRODUCTION

Seed is a source of origin and beginning of anything (Webster, 1962), and about 90 percent of all the food crops grown on earth are propagated by seed (Neergaard, 1977); Seeds being the source of plant may play a vital role in the total biological yield per unit time and per unit plant surface. Seeds have been shown to harbor a number of Fungi. Many of them are known to cause important diseases (Suryanarayana & Bhombe, 1961, Siddiqui *et.al* 1974). These fungi cause severe losses to seeds, seedlings and later stages of plant growth and finally affect quantity and quality of crops.

MATERIAL AND METHODS

i. **Selection of Seeds :**

Cultivators of groundnut seeds were collected from the Oil seed Research Station, Latur.

ii. **Study of Mycoflora:**

The surface mycoflora of the selected seeds was studied by incubating the seeds for 4 - 6 days on glucose nitrate agar medium (GNA)

iii. **Preparation of plant extracts:**

The leaves of the plant were cleaned and dried. The dried leaves were crushed into fine powder with the help of blender. 5% leaf extract in hot sterile distilled water was prepared.

iv. **Seed treatment:**

The different groundnut seed cultivars were treated with leaf extract of *Azadirachta indica* A. Juss. by soaking seeds in it for 5 minutes, 15 minutes and 30 minutes.

v. **Study of Mycoflora of treated seeds:**

The seeds with plant extract for the above time intervals were incubated in glucose nitrate agar medium for 4-6 days. They were studied for the growth of fungal forms from the seed surface.

TABLE NO. 1: MYCOFLORA OF GROUNDNUT CULTIVARS ON UNTREATED SEEDS

Sr. No.	Name of Fungus	Groundnut Cultivars		
		SB-XI	L-33	JL-24
1.	<i>Curvularia lunata</i>	++	++	++
2.	<i>Drechslera sps</i>	+	-	-
3.	<i>Alternaria alternate</i>	++	+	+
4.	<i>Fusarium moniliforme</i>	+	+	+
5.	<i>Aspergillus flavus</i>	++	++	++
6.	<i>Aspergillus niger</i>	+	+	+
7.	<i>Cladosporium sps.</i>	+	-	-
8.	<i>Rhizopus nigricans</i>	+	+	+
9.	<i>Rhizoctonia bataticola</i>	+	-	-

Symbols used in Table No. 1

+	=	Presence on 10% Seeds
++	=	Presence of 20% Seeds
-	=	Absence on Seeds

TABLE NO. 2 : EFFECT OF LEAF EXTRACTS ON SEED MYCOFLORA.

Sr. No.	Ground nut cultivars	Mycoflora on treated Seeds		
		<i>Azadirachta indica</i> A.Juss. Ethyl acetate Extract.		
		Exposure time		
		5 min.	15 min	30 min
1	SB-XI	<i>Curvularia sps.</i> <i>Fusarium sps.</i> <i>Drechslera sps.</i> <i>Rhizoctonia bataticola</i>	<i>Curvularia sps.</i> <i>Drechslera sps.</i>	---
2	L-33	<i>Curvularia sps.</i> <i>Fusarium sps.</i> <i>Alternaria sps.</i>	<i>Curvularia sps.</i> <i>Alternaria sps.</i>	---
3	JL-24	<i>Curvularia sps.</i> <i>Fusarium sps.</i> <i>Alternaria sps.</i>	<i>Curvularia sps.</i> <i>Fusarium sps.</i> <i>Alternaria sps.</i>	---

RESULTS

The most common fungi found to be growing on all untreated seeds were *Curvularia lunata*, *Alternaria alternata*, *Drechslera sps*, *Fusarium moniliforme*, *Rhizopus nigricans*, *Rhizoctonia bataticola* etc. (Table No. 1 & 2). The observation with seeds treated with the plant extract reveal that short treatment of 5 or 10 minutes had almost no effect over the seed mycoflora. Many of the fungi grew when the seeds were treated for short period. The inhibition of fungal growth was observed when the seeds were soaked in the plant extract for minutes. Not a single fungus grew after complete incubation period.

DISCUSSION

The result indicates that the longer duration of seed treatment with plant extracts is effective in controlling the growth of the entire surface borne seed Mycoflora. Application of plant extracts for the control of seed borne diseases is a method devoid of any health hazard problem. Hill bunt of Wheat (*Tilletia foetida*) was effectively controlled by seed treatment with plant extracts of *Datura stramonium*, *Thuja sps* and *Eucalyptus* Singh *et al* (1980). Similar findings were observed by Deans and Ritchie (1987) and Moleyar, and Narasimhan (1987). De Tempe (1970) obtained interesting results with neem oil (*Azadirachta indica*) against seed borne pathogens like *Fusarium*, *Aspergillus* and *Drechslera*. The anti-fungal effect of selected medicinal extracts can be applied at a larger scale to treat the seeds before sowing them in the field. The extract being of plant origin has least hazardous effects on the seeds as well as on soil.

The seed treatment with plant extract does not have any adverse effect on the germination of seed even after the treatment for 30 minutes. So the seed treatment of plant extract will not create any problem of pollution and the chemicals of plant extracts are easily degraded in the soil.

REFERENCES

1. Deans, S.G. and Ritchie, G. (1987) : Antibacterial properties of plant essential oils. *IJFM* 5:165-180.
2. De Tempe (1970) : Testing cereal seeds for *fusarium* infection in Netherlands. *Proc. ISTA* 35:193-206.
3. ISTA (1966) : International rules of seed Testing 1966, International Seed Testing Association 31: J -152.
4. Moleyar, V. and Narasimhan, P. (1987) : Mode of antifungal action of essential oil components citral and comphor. *Indian Journal of Expt. Bio.* 31 (4) : 322 - 334.
5. Neergaard, P. and S. B. Mathur (1980) : University Teaching of Seed Pathology Published by Prasaranga, University of Mysore, India.
6. Neergaard, P. (1977) : Seed Pathology Vol. I & II McMillan Press ltd. London : pp 1187.
7. Subramanian C.V. (1971) : Hypomycetes ICAR, New Delhi : pp 930.
8. Suryanarayana D, B.B. Bombe (1961) : Studies on the fungal Flora of some vegetables seeds. *Indian Phytopath* 32: 30-41.
9. Siddiqui (1974) : Fungal Flora associated with the seeds of Cereals and Vegetables in India *Seed Res* 2: 46-50.
10. Singh, A. K. Diekhit, A, Sharma, M.L. and Dixit S. N. (1980) fungitoxic activity of some essential oils. *Economic Botany* 34 : 186-190.
11. Webser N (1962) : Webster New Twentieth Century Dictionary. The world Pub Co, Clevelant & New York.