

Biological Control of Seed Mycoflora of Groundnut Using Extract Of *Ocimum Sanctum* L.

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Abstract— In present investigation study of fungi associated seeds of groundnut variety local revealed presence of 20 fungi on the seed surface. Seed borne fungi like *Aspergillus flavus*, *Alternaria Curvularialunata*, and *Fusarium moniliforme* were found. These fungi were found to be responsible for the loss in dry weight (dwt), loss in total protein content (TPC), total fat content (TFC) and total starch content (TSC) of the seeds of groundnut variety. The culture filtrates (CF) of the predominant seed borne fungi where found to be more inhibitory for seed germination (CG) and Seedling emergence (SE) Of the test cultivar, therefore the root, stem and leaf extracts of *ocimum sanctum* L. were used for the biocontrol of the seed mycoflora of groundnut. The test extract were found to be more inhibitory for the incidence of seed mycoflora (ISM), for germination and seed growth of seed borne fungi. Also found stimulatory for the SG and SE of the groundnut

Keywords—Seed mycoflora, seed germination SG seedling emergence (SE), biocontrol

INTRODUCTION

In this investigation groundnut (*Arachis hypogaea* L.) is an important oil seed crop legume in India. It is a self-pollinated annual legume crop and it originated from South America. It is also called as “King of oil seeds”, widely grown for its high quality 50 % edible oil and food use in the tropical and warm temperate regions of the world. The crop is grown in more than 100 countries. The major groundnut producers are China, India, Nigeria, USA, Senegal. It contains oil to an extent of 48 - 51 %. Seeds are rich in fats, protein, vitamin B1, B2, B6, nicotinic acid and other vitamins. It is also a good source of lecithin present to the extent of 0.5-0.7% in decorticated nuts. Peanut butter has become a common edible diet. Groundnut cake has high nutritive value. Peanut flour is suitable for supplementing white flour (Sastri, 1948). The seeds of groundnut carry number of fungi as seed mycoflora both in field as well as during storage. The seed microflora naturally associated with the grains found to be responsible for the seed bio deterioration and poisoning the grains. Some seed Borne fungi where known to inhibit SG, SAnd causes serious diseases like Seedling rot, seedling light, etc to the crop (Mathur and Sinha, 1977). (*Ocimum sanctum*) Syn. *Ocimum tenuiflorus* known as “Tulsi” is a well known sacred plant of the Hindus, widely used. In Ayurveda Tulsi is used against all kinds of fevers. Whole plant has antibacterial, antiperiodic, hypotensive and expectorant

properties. The powdered form of *Ocimum sanctum* leaf extract was found more suitable for the control of *Sclerotinia sclerotiorum*. Jha et al., (2000), Upmanyu and Gupta (2005) and Louis et al., (2011). Upmanu and Gupta (2005). In view of this problems detailed investigation where made to control biologically the seed mycoflora of groundnut by using leaf stem and root extract of *ocimum sanctum* L.

MATERIALS AND METHODS

In present investigation the method described by Paul Neergaard (1977), have been used for the collection of seed samples. Accordingly seed samples of the groundnut variety where collected from fields, store houses, marketplaces and research centres. A seed sample was prepared by mixing the individual seed sample together and was preserved in Gunny bags at room temperature. In present study the seed borne fungi of groundnut variety were detected by Agar plate and standard blotter test method as recommended by ISTA (1966), De Tempe (1970) and Neergaard (1977). Preliminarily the seed borne fungi of groundnut variety were identified based on sporulation characters. On the observation of the fungal characters was done under compound microscope and their identification was confirm with the help of latest manual (Subramanian, 1971; Neergaard and Mathur 1980; Jha 1993 and Mukadam 1997). Pure cultures was prepared and maintained on potato dextrose Agar (PDA) slants. The biodeterioration of seeds of groundnut variety was studied by infesting them with the seed borne fungi. After 10 days of incubation the seeds were washed with sterile distilled water and oven dried changes in DWT, TPC, TFC and TSC of the seeds were observed (AOAC, 1966). The surface sterilized seeds without infestation served as control. The CF of the predominant seed borne fungi was obtained by growing them in different media for 10 days at room temperature. The toxicity of the Culture filtrates was tested on the seeds for germination SE and root and shoot growth of groundnut variety. The roots stem and leaves of *Ocimum sanctum* L. Where dried and crushed separately into fine powder with the help of blender. 5% extract in hot distilled water was tested against the seeds of groundnut variety for I SM, SG SE. The extracts were also tested against the spore germination growth and sporulation of the seed borne fungi.

RESULT AND DISCUSSION

Seedmycoflora of groundnut variety. Seed mycoflora of twenty fungi were found to be associated with theseeds of test cultivar. The fungi like *Aspergillus terreus*, *Aspergillus flavus*, *Aspergillus niger*, *Curvularialunata*, *Drechsleratetramera*, *Fusarium moniliforme*, *Alternaria tenuis* and *Rhizopus nigricans* were found to be predominant.

CHANGES IN DRY WEIGHT OF SEEDS AND SEED CONTENTS.

From the observation from table it is clear that the predominant seed borne fungi of the test cultivators were found to be highly responsible for loss in DWT, TPC, TFC and TSC of seeds of groundnut variety. Similarly *Fusarium moniliforme* for loss in TPC and *Drechsleratetramera* for TFC loss were found to be more responsible

EFFECT OF SEED BORNE FUNGI ON SG AND SE OF GROUNDNUT VARIETY

The CF of predominant seed borne fungi were found to be inhibitory for SG root and shoot

Elongation and also caused root and shoot rot. The CF of *Alternaria tenuis* was found to be inhibitory for SG, SE, root length shoot length then the other seed borne fungi and also caused notable root and shoot loss of the test cultivar.

EFFECT OF EXTRACT OF OCIMUM SANCTUM ON SEED MYCOFLORA

It is clear that the SG and SE: From the result presented in table it is evident that the root stem and leaf extract of *Ocimum sanctum* were found to be inhibitory for seed mycoflora and stimulatory for SG, SE, root and shoot elongation. The leaf extract was found to be more effective.

EFFECT OF EXTRACT OF OCIMUM SANCTUM ON SPORE GERMINATION AND GROWTH OF SEED BORNE FUNGI

It is clear from the result that the root stem and leaf extract of the test plant part were found to be inhibitory for the spore germination of the seed borne fungi of groundnut variety. The leaf extract was found to be more effective against the spore germination and growth of seed borne fungi from table.

TABLE 1 - Seed mycoflora of Groundnut by Agar plate (A) and Standard Blotter paper (B) methods.

S.N.	Associated Seed Mycoflora	Percent Incidence	
		Agar plate	Standard Blotter paper
1	<i>Alternaria tenuis</i>	40	28
2	<i>Aspergillus flavus</i>	70	50
3	<i>A.fumigatus</i>	-	02
4	<i>A.nidulans</i>	20	10
5	<i>A.niger</i>	70	60
6	<i>A.ustus</i>	10	05
7	<i>Curvularialunata</i>	65	55
8	<i>C.pallescens</i>	22	18
9	<i>Drechsleralongirostrata</i>	10	-
10	<i>Fusarium moniliforme</i>	45	30
11	<i>Penicillium spp</i>	15	10
12	<i>Pythium</i>	7	-
13	<i>Rhizoctonia solani</i>	20	15
14	<i>Rhizopus nigricans</i>	65	45

TABLE 2 - Changes in dry Weight (DWT) total protein content (TPC), total fat content (TFC) and total starch content (TSC) o the seeds of groundnut infested with some predominant seed borne fungi

Seed Borne Fungi	DWT gm	TPC Mg/gm	TFC Mg/gm	TSC Mg/gm
Alternaria tenuis	15.1	121	35	234
Aspergillus flavus	09.6	101	24	205
Curvularialunata	10.0	124	110	245
Drechsleratetrame ra	15.2	135	8	215
Fusarium moniliforme	10.3	90	18	260
Control	24.5	135	45	350

TABLE 3 - EFFECT OF ROOT ,STEM AND LEAF EXTRACTS OF OCIMUM SANCTUM.L.ON INCIDENCE OF SEED MYCOFLORA ,SEED GERMINATION ,SEEDLING EMERGENCE ,ROOT LENGTH AND SHOOT LENGTH OF GROUNDNUT

Source of Extract	ISM %	SG %	SE %	RL mm	SL Mm
Root	06	95	69	61	47
Stem	10	92	67	59	45
Leaf	04	97	70	62	48
control	100	34	24	22	17

References

A OAC (1966): Official method of analysis Ninth edition AOAC, Washington PP 4

Baig Mumtaz (2006) : Seed Health Testing : Oil Seeds. Ph.d Thesis submitted to Swami Ramanand Teerth Marathwada University ,Nanded

De Tempe(1970): Testing cereal seeds for Fusarium infection in Netherlands. Proc.ISTA.35: 193- 206.

Gupta, R.K. and Bansal, R.K. (2003). Comparative efficacy of plant leaf extracts and fungicides against F. oxysporumSchlecht inducing fenugreek wilt under pot house condition. Annals

ISTA(1966): International rules of seed testing.1966.Int. Seed test.Asst.31: 1- 152.

Jha DK.(1993): Latest book on seed Pathology Vikas Publication House Private Limited New Delhi 132 PP.

Mukadam DS.(1997): The illustrated Kingdom of fungi some selected genera,Aksharganga PrakashanAurangabad, India.

Mathur S.M and S. Sinha Mathur(1980): Studies on aflatoxins by seed borne Aspergillus of. Bajra. Production India National Science Academy.40(3): 75- 78.

NeergardP. and SB Mathur(1980):.University teaching of seed Pathology published by PrasarangaUniversity of Mysore, India.

NeergardP(1977): Seed pathology volume I and II. Macmillan press limited london.1187 pp.

Subramanian C.V.(1971). Hypomycetes ICAR new Delhi.930 PP.

Sastri, B.N.(1948). The wealth of India. A dictionary of raw materials and industrial products. Vol I. Council of Scientific and Industrial Research, New Dehli. 253pp

ISTA, International seed testing association. Seed Sci. Tech. 1976; 4:51-77