Studies on Biological Control of Fungi

Tugaonkar S.G.

Department of Botany, Indira Gandhi Senior College, CIDCO, Nanded (M. S.)

***Abstract*— The poor incidence of *Aspergillus rubrer* was found in different concentrations of seed extracts of *Datura stramonium* and *Ipomea carnea.* Minimum incidence was found in 10 and 25 percent extracts of *Argemone mexicana* and *Cassia tora*, In general 50 percent seed extracts of all the tested medicinal plants were beneficial to control incidence of fungi. The maximum incidence of *Alternaria alternata Aspergillus flavus, A. niger, A. ustus, Curvularia lunata, Fusarium roseum* and *F. moniliforme* was observed on Soybean in presence of all the test percent extracts of medicinal plants.**

***Keywords*—** Sunflower, Soybean, Fungi, Medicinal plants

I. Introduction

Seeds are the main sources for contamination of oil seeds in field. Handling and packaging causes additional contamination during storage. The seeds are collected by simple methods and are commonly exposed to many contaminants before being dry enough and at storage in low temperature as per ([1],[2],[3]) Numerous studies revealed a wide spectrum prospects of using extracts of plants for biological control of pathogenic fungi ([4],[5],[6]). As a result, the management of fungi was carried out by using different seed extracts of medicinal plants.

II. Materials and Methods

A) Collection of Seed Samples

The collection of Seed samples was as per method described by [7]. The seed samples were collected from fields, store houses, market places and seed companies and composite sample was prepared by mixing the individual samples together. The samples preserved in cloth bags in laboratory at room temperature. The seeds of *Annona squamosa, Argemone mexicana, Cassia tora, Datura stramonium* and *Ipomoea carnea*, were collected from study region. The seeds were shade dried at room temperature and were ground into fine powder and stored in airtight containers at room temperature till extraction.

B) Preparation of Acetone Extract

The method for acetone extraction was adopted as per [8] with slight modification in the preparation of concentrations. The powder of seeds extracted with organic solvent acetone, based on order of polarity using soxhlet apparatus. The extracts obtained were subsequently concentrated under reduced pressure to get their corresponding residues. Seeds of test spices were soaked in 10, 25 and 50 percent concentrsations of 50 ml. acetone seed extracts in 100ml Erlenmeyer flask covered with parafin. The flasks were kept overnight at 25 to 30^0C in darkness as per [9]

Seeds were tested [10] with slight modifications. The seeds soaked in plant extracts were taken and ten seeds plated in each petriplates on three layers of moistened blotter papers. The seeds of the same

samples soaked in distilled water served as control. Seeds were incubated at 25 to 30°C for ten days. After ten days, seeds were examined under a stereomicroscope for growth of fungi and the data was recorded.

C) Identification of Seed Borne Fungi.

The fungi occurring on each and every seed on the plates were identified preliminary on the basis of sporulation characters like sexual or asexual spores with the help of stereoscopic binocular microscope. The identification and further confirmation of seed-borne fungi was made by preparing slides of the fungal growth and observing them under compound microscope. Pure cultures of these fungi were prepared and maintained on glucose nitrate agar (GNA) slants. The identification was made with the help of manuals, as per ([11], [12])

III. Experimental Results

As per the results of table number 1, maximum appearance of *Alternaria alternata, Aspergillus flavus, A. glaucus, A. niger* and *Cladosporium cladosporidies* was noticed in 10 and 25 percent testd seed extracts. The *Aspergillus rubrer* did not appear in the extracts of *Datura stramonium, Ipomea carnea* and *Annona squamosa.* Least incidence of fungi was found in 10 and 25 percent extracts of *Argemone mexicana* and *Cassia tora*. The seed extracts of the tested medicinal plants were more beneficial to control their appearance on spices. *Botrytis cineria, Curvularia tetramera, Fusarium oxysporum, Fusarium roseum,* were inhibited in all the concentrations of test extracts of medicinal plants.

The poor incidence of *Aspergillus rubrer* was found in different concentrations of seed extracts of *Datura stramonium* and *Ipomea carnea.* Minimum incidence was found in 10 and 25 percent extracts of *Argemone mexicana* and *Cassia tora*, whereas 50 percent seed extracts was effective in their incidence in case of *Aspergillus rubrer*. Different concentrations of seed extracts of *Annona squamosa* proved very much effective to control fungal incidence. The *Helminthosporium tetramera* did not respond to test concentrations of seed extracts of *Argemone mexicana* and *Cassia tora* except *Datura stramonium, Ipomea carnea* and *Annona squamosa*. In general 50 percent seed extracts of all the tested medicinal plants were beneficial to control incidence of fungi.

As per the results of table 2, least number of fungi were observed with their dominance on Soybean as compared to Sunflower. Seven fungi appeared on Soybean in presence of different seed extracts of medicinal plants. The maximum incidence of *Alternaria alternata Aspergillus flavus, A. niger, A. ustus, Curvularia lunata, Fusarium roseum* and *F. moniliforme* was observed on Soybean in presence of all the test percent extracts of medicinal plants. In general 50 percent seed extracts were highly beneficial to control the appearance of fungi.

Fungi	*Annona squamosa*				*Argemone mexicana*			*Cassia tora*			*Datura stramonium*			*Ipomoea carnea*		
	% of seed extract															
	C	**10**	**25**	**50**	**10**	**25**	**50**	**10**	**25**	**50**	**10**	**25**	**50**	**10**	**25**	**50**
	% incidence															
Alternaria alternata	15	20	10	10	15	10	10	15	10	10	20	15	05	15	10	05
Aspergillus flavaus	25	20	15	--	20	10	10	15	15	15	25	20	10	15	15	10
Aspergillus glaucus	35	25	20	10	30	25	10	25	15	10	25	15	10	10	05	05
Aspergillus niger	20	--	--	--	15	05	--	15	10	10	20	20	05	10	--	--
Aspergillus rubrer	10	--	--	--	10	05	--	15	10	--	--	---	--	05	--	--
Cladosporium cladosporidies	25	25	15	05	20	10	05	30	20	50	20	10	--	10	--	--
Curvularia tetramera	10	--	--	--	10	--	--	05	--	--	--	--	--	--	--	--
Fiusarium oxysporium	15	05	--	--	10	--	--	10	--	--	--	--	--	05	--	--
Fusarium roseum	10	--	--	--	10	--	--	10	--	--	--	--	--	--	--	--
Helminthosporium tetramera	15	10	10	05	15	10	--	05	--	--	15	10	10	10	15	05

C= Controle, -- = No incidence

Table 1. Effect of seed extracts of medicinal plants on mycoflora of Sunflower (Acetone)

Fungi	*Annona squamosa*				*Argemone mexicana*			*Cassia tora*			*Datura stramonium*			*Ipomoea carnea*		
	% seed extract															
	C	**10**	**25**	**50**	**10**	**25**	**50**	**10**	**25**	**50**	**10**	**25**	**50**	**10**	**25**	**50**
	% incidence															
Alternaria alternata	10	10	10	15	20	05	05	10	05	05	25	20	15	15	10	05
Aspergillus flavus	15	15	10	--	20	15	05	20	10	05	20	15	10	15	10	10
Aspergillus niger	20	20	20	10	15	10	05	20	15	10	30	30	25	25	10	10
Aspergillus ustus	15	15	10	05	20	10	05	20	20	15	20	20	15	20	20	10
Curvularia lunata	10	10	10	05	15	10	10	20	20	10	20	10	10	15	15	05
Fusarium moniliforme	20	20	15	05	20	15	10	20	15	10	20	10	10	20	05	--
Fusarium roseum	20	20	05	10	20	15	05	20	15	10	10	20	20	05	05	--

C= Controle, -- = No incidence

Table 2. Effect of seed extracts of medicinal plants on mycoflora of Soybean (Acetone)

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