INHIBITION OF MYCELIAL GROWTH OF SOME SEED-BORNE MYCOFLORA ASSOCIATED WITH BITTER GOURD USING SOME CHEMICAL FUNGICIDES

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Abstract: Two chemical fungicides were tested against some seed-borne fungi *viz. Alternaria alternata, Aspergillus flavus, A.nige, Fusarium solani, Myrothecium roridum* and *Rhizopus spp*. for the evaluation of inhibition of mycelial growth. Of the three fungicides used, Ridomil gave good results at all the concentrations against all the test fungi compared with Bavistin.

Keywords: Bitter gourd, chemical fungicides, mycelial growth, seed-borne mycoflora

INTRODUCTION

Microorganism play an important role in affecting the quality of seed , of which fungi are the largest group . These pathogens are disastrous as they reduced seed vigour and weaken the plant at its initial growth stages. Some of the seed-borne fungi were found to be very destructive, caused seed rot, and decreased seeds germination. Also cause pre and post germination death. Seed-borne fungi are, however easily controlled compared to air- borne or soil-borne fungi. Control of fungal disease through chemotherapy is receiving much attention as a result of its efficacy. Many workers have used various fungicides for controlling seed-borne fungi by treating seeds of vegetables or other crops directly with the fungicides.

Bitter gourds (*Momordica charantia* L.) belong to family Cucurbitaceae which consists of about 118 genera and 825 species. Members of this family supplying edible fruits and useful seeds for the human being .Plants of this family have high genetic diversity for fruit, shape and other charachrterstics, resulting in a variety of uses. Bitter gourd is an important summer vegetable grown extensively throughout the country and serve as the main source of nutrition, energy valuable vitamins and minerals. All the cucurbits grown are subjected to various fungal disease Rath *et al.* (1990) worked on rotting of bitter gourd (*M. charantia* L.) and analyzed 138 samples of fruits collected from the markets of Orissa out of which 15 % showed fungal rots caused by *Aspergillus flavus , Aspegillus niger , Fusarium oxysporium , Geotrichum candidum , Mucor sp*. and *Rhizopous arrhizus*.

Nair (1982) analyzed the seeds of 8 cucurbitaceous vegetable crops and 11 fungal species were isolated. Naseema *et al*. (1983) reported externally as well as internally seed-borne fungi from the seeds collected from the stores. Fungi such as *Aspergillus flavus, A.niger and Rhizopus stolonifer* were the most common fungi associated with seeds of *Amaranthus* (*Amranthus geneticus* L.), okra (*Abelmoschus esculentus Moench*) bitter gourd (*M. charantia* L.*), cowpea (Vigna unguiculata* L. Walp.), cucumber (*Cucumis sativus* L.) , pumpkin (*Curcurbita pepo* L.) and tomato (*Lycopersicon lycopersicum* L. *Karsten*). Devi and Selvaraj (1994) studied germination of bitter gourd enhanced by soaking its seeds in a number of chemicals like, Bavisitn, boric acid, calcium hydroxide, calcium oxychloride, sodium dihydrogen phosphate, potassium dihydrogen phosphate and succinic acid keeping in view the importance of seed-borne disease. The present paper deals with the study of mycelial growth of some seed-borne mycoflora associated with bitter gourd using some chemical fungicides.

MATERIAL AND METHOD

Soaking method

Soaking method following Gangopadyay and Kapor (1977) was used with some modifications. 200 seeds of bitter gourd were soaked in different concentrations of fungicides (Ridomil gold and bavistin) and left for 1 hour to enable the seeds to absorb the fungicides. After treatment, seeds were air –dried for 30 min and analyzed for their efficacy against seed-borne mycoflora following standard blotter and agar plate methods.

Chemical seed treatment

Two fungicides namely Ridomil gold and Bavisitn with different concentrations were used. Ridomil Gold (metalaxyl + manacozeb) 20-30-40 mg/10 ml and bavastin (Carbendazim) 20-30-40 mg/10 ml were used. A total of 200 seeds off bitter gourd, naturally infected with important seed-borne fungi were treated individually with the fungicides at 20, 30 and 40 mg / 10 ml. Seeds for control treatment were similarly soaked in sterilized distilled water. Seeds of each treatment were transferred on potato dextrose agar medium in 9 cm diameter petriplates. There were four replicates of each treatment with 25 seed in each replicate .Seeds were examined and fungal colonies appeared on seeds were identified based on habit characters on seeds and colony character on blotter around the seeds. Result was expressed in percentage.

Table: Effect of fungicides on the inhibition of mycelial growth of seed–borne fungi of bitter ground.

Name of fungi	Fungicides	% Inhibition of mycelial growth in different conc.			
		20 mg/ 10 ml	**30 mg /10ml**	**40 mg /10 ml**	**Control**
Alternaria alternata	Ridomil Gold	0	0	0	9.14
	Bavistin	3.5	2.2	0	9.14
Aspergillus flavus	Ridomil Gold	4.2	1.5	0	19.42
	Bavistin	8.4	4.5	0	19.42
Aspergillu niger	Ridomil Gold	0	0	0	6.45
	Bavistin	2.7	1.75	0	6.45
Fusarium solani	Ridomil Gold	1.2	0	0	4.6
	Bavisitn	3	2	0	4.6
Myrothecium roridum	Ridomil Gold	2.2	0	0	4.62
	Bavistin	1.5	0	0	4.62
Rhizopus Sp.	Ridomil Gold	2	1.2	0	13.62
	Bavisitn	3.75	2.45	0	13.62

RESULT AND DISCUSSION

Bitter gourd seed were treated with two fungicides that is, ridomil gold and bavistin to determine their effect on seed–borne fungi. The seed sample was naturally infected with six seed-borne fungi such as *Altarnaria alternata, Aspergillus flavus, A.niger, Fusarium solani, Myrothecium roridum and Rhizopous spp*.

The seeds were treated individually with the fungicides at different doses: 20, 30 and 40 mg/10 ml. These fungicides significantly reduced the population of all fungi present in naturally infected seed samples at 20, 30 and 40mg / 10 ml concentrations. Ridomol gold controlled almost all the fungi at the dose of 30mg/10 ml and 40 mg/10 ml. Only *Rhizopus spp*. (1.2%) and *A.flavus* (1.5%) could survive after treatment 30 mg/10ml. But there were no pathogens at 40mg/10 ml. Bavistin controlled all the fungi at 40 mg/10 ml but not at 20 mg / 10 ml and 30 mg/10ml as effectively as ridomil gold and this study in contrary the findings of (Ibiam *et al*., 2000, 2006) on rice seed. Ibiam *et al.* (2006) stated that fungicides either inactivate or killed the pathogen in the seeds or seedlings as the germination of seeds starts .The metabolic activities of fungi could not be arrested at lower concentrations of fungicides; it may be due to the fact fungicides are unable to destroy few fungi at lower concentrations. As the concentrations of fungicides increased, the metabolic activities of the fungi were completely destroyed.

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