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# Effect of fungicides on seed mycoflora and seed germination of mustard and cauliflower

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Ten fungi were found to be associated with both musturd and cauliflower seeds . Out of them *Alternaria alternata* and *A.brassicicola* appeared in high frequency on both seeds. These two pathogenic fungi are borne by seeds externally and internally. Five fungicides viz Dithane-M45,Bavistin,Blitox-50 , Thiram and Captan 50w were applied on both seeds to check mycoflora. Out of them ,Bavistin(500 ppm) was able to eliminate most of the fungi. Moreover Bavistin treated seeds yielded maximum percentage of seed germination.

Key words: Seed mycoflora,mustard seed , cauliflower seeds, fungicides, germination,control

## INTRODUCTION

Seeds are known to borne many fungi on their surface and inside. Some of them play major role in spread of diseases (Christensen, 1955; Neergard, 1977; Chahal, 1981).Seed borne diseases cause heavy damage to our vegetables and oil-yielding crops (Neergard, 1977; Moude and Dudly, 1971). *Alternaria* leaf spot disease causes serious loss of yield of mustard and cauliflower (Anonymous, 1987).

The present work is undertaken to make the seed mycoflora and also to know the effect of some fungicides on these two seed-mycoflora and seed-germinations.

## MATERIALS AND METHODS

Seed samples of mustard (*Brassica campestris*) and cauliflower (*Brassica oleracea* L var *botrytis*) were collected from farmers field just after harvest of the crops. For isolation of seed mycoflora two standard methods viz. Standard Blotter Method (SBM) and Agar Plate Method (APM) (Muskett, 1948;De Temp, 1953;Anonymous, 1966) were used. To isolate internal seed-borne fungi, seeds were surface- sterilized with 0.1 per cent mercurie chloride for three minutes followed by three times washing with sterilized distilled water. Five fungisides viz. Dithane M-45, Bavistin,Blitox-50, Thiram and Captan 50W at 500 PPM concentration were tested for sensitivity of seed mycoflora and germination of seeds. Two hundred seeds were soaked in conical flask containing 100 ml of fungicidal solution (500 ppm.). Then the flasks were shaken for 10 minutes and left for 4-6 hrs at room temperature. Treated seeds were then plated on sterilized petridishes containing agar media(APM). These petridishes were incubated for five days at 20+2°C. Percentage of incidence or frequency of individual fungus was calculated by the following formula :

$$\text{Percentage of the frequency} = \frac{\text{No. of seeds containing particular fungus.}}{\text{Total no. of seeds}} \times 100$$

## RESULTS AND DISCUSSION

It was evident from the Table 1 that ten fungi belonging to eight genera were isolated from unsterilized seeds of mustard and cauliflower. It (Table 1) also showed that Agar Plate Method (APM)is better than Standard Blotter Method (SBM) in isolating seed mycoflora. Similarly Priya *et.al.* (1995) reported that APM was most efficient in isolating seed-mycoflora. But Lokshe and Hiremath (1992) observed that SBM was better than APM for isolation of seed-borne fungi. *Alternaria alternata*, *A brassicicola*, *Aspergillus flavas*, *A*

**Table 1.** Fungi isolated from mustard and cauliflower seeds (using APM and SBM technique)

| Mycoflora | Percent of seeds yielding fungi | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Mustard | | | | Cauliflower | | | |
| | USS | | SSS | | USS | | SSS | |
| | APM | SBM | APM | SBM | APM | SBM | APM | SBM |
| *Alternaria alternata* | 15.0 | 8.0 | 6.5 | 4.7 | 16.0 | 10.0 | 9.0 | 6.0 |
| *A.brassicicola* | 18.0 | 5.0 | 7.0 | 1.0 | 10.1 | 8.0 | 6.0 | 3.0 |
| *Aspergillus niger* | 12.0 | 5.0 | 8.0 | 1.0 | 9.1 | 7.0 | 0.0 | 0.0 |
| *A.flavus* | 10.1 | 2.1 | 4.0 | 0.0 | 4.0 | 5.5 | 0.0 | 1.0 |
| *A.nidulans* | 3.0 | 2.0 | 0.0 | 1.0 | 6.5 | 5.5 | 0.0 | 0.0 |
| *Curvularia* sp. | 10.0 | 3.1 | 0.0 | 0.0 | 5.5 | 2.1 | 0.0 | 0.0 |
| *Mucor* sp. | 7.5 | 4.0 | 0.0 | 0.0 | 5.6 | 5.5 | 0.0 | 0.0 |
| *Penicillium* sp. | 5.2 | 2.0 | 0.0 | 1.0 | 4.0 | 3.5 | 0.0 | 0.0 |
| *Rhizopus* sp. | 3.0 | 2.0 | 0.0 | 0.0 | 5.0 | 2.5 | 0.0 | 0.0 |
| *Helminthosporium* sp. | 5.1 | 1.0 | 1.0 | 1.0 | 3.0 | 1.0 | 0.0 | 0.0 |

USS= Unsterilized seed
SSS = Surface Sterilized seed.

*niger* and *Helminthosporium* sp. were associated with mustard seeds externally and internally.The result (Table 1) revealed that the frequency of *A.brassicicola* was maximum(18) followed by *A. alternata*(15) and *Aspergillus niger*(12) on mustard seed externally. It was in agreement with the results of other workers (Singh *et.al.* 1991, Aggarwal and Mehrotra,1992; Priya *et.al.* 1995). on the other hand, the frequency of *A.alternata* was maximum(16) followed by *A.brassicicola*(10.1) on seedmycoflora of cauliflower. Moreover, these two fungi were also internal seed borne in cauliflower seeds. It was supported by the results of Khan *et.al.*(1994).

*Aspergillus* were survived in very negligable frequency in comparison with control. Other fungicides were unable to check completely the association of seed-mycoflora. The Table 2 indicated that Dithane M-45 was next to Bavistin followed by Blitox-50. Moreover, Bavistin treated seeds yielded maximum percentage of seed germination (80) followed by Blitox-50 (70) and Dithane M-45 (69), respectively. Our present investigation results were at par with other workers' works (Dharamvir *et.al.* 1972; Jhasmaria, *et.al.*1975; Priya and Aggarwal, (1995).

Bavistin treated cauliflower seeds (Table 3) showed

**Table 2:** Effect of different fungicides on seed-mycoflora and seed germination of mustard

| Mycoflora | Percent of seeds yielding fungi | | | | | |
|---|---|---|---|---|---|---|
| | Control | Dithane-M-45 | Bavistin | Blitox-50 | Thiram | Captan-50W |
| *Alternaria alternata* | 15.0 | 5.1 | 0.0 | 6.5 | 7.8 | 8.3 |
| *A.brassicicola* | 18.0 | 4.2 | 1.0 | 6.1 | 6.7 | 8.5 |
| *Aspergillus niger* | 12.0 | 3.0 | 2.0 | 6.5 | 7.5 | 8.0 |
| *A.flavus* | 10.1 | 3.5 | 1.0 | 7.0 | 8.0 | 9.0 |
| *A.nidulans* | 3.0 | 2.1 | 1.0 | 1.0 | 3.0 | 2.0 |
| *Curvularia* sp. | 10.0 | 1.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| *Mucor* sp. | 7.5 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| *Penicillium* sp. | 5.2 | 7.0 | 0.0 | 1.0 | 0.0 | 1.0 |
| *Rhizopus* sp. | 3.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| *Helminthosporium* sp. | 5.1 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Percentage of seed germination | 62.5 | 69.0 | 80.0 | 70.0 | 67.0 | 65.0 |

It was clear from the Table 2 that Bavistin fungicide was able to eliminate most of the fungi from mustard seeds. But *A.brassicicola* and three genera of *Aspergillus* were isolated in poor frequency, other that it was most efficient to eliminate most of the fungi. But *A.alternata* and three genera of

**Table 3:** Effect of different fungicides on seed-mycoflora and seed germination of cauliflower

| Mycoflora | Percent of seed yielding fungi | | | | | |
|---|---|---|---|---|---|---|
| | Control | Dithane-M-45 | Bavistin | Blitox-50 | Thiram | Captan-50W |
| *Alternaria alternata* | 16.0 | 5.7 | 1.0 | 6.7 | 8.0 | 8.1 |
| *A brassicicola* | 10.1 | 4.0 | 0.0 | 8.0 | 8.0 | 8.5 |
| *Aspergillus niger* | 9.1 | 3.0 | 2.0 | 4.1 | 7.5 | 8.0 |
| *A.flavus* | 4.0 | 3.0 | 2.0 | 2.1 | 1.1 | 0.0 |
| *A.nidulans* | 6.5 | 2.5 | 2.5 | 0.0 | 1.0 | 0.0 |
| *Curvularia* sp. | 5.5 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| *Mucor* sp. | 5.6 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| *Penicillium* sp. | 4.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| *Rhizopus* sp. | 5.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 |
| *Helminthosporium* sp. | 3.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 |
| Percentage of seed germination | 60.2 | 80.0 | 85.1 | 73.0 | 72.5 | 71.0 |

fungicides' actions on seed mycoflora were better than control (untreated seeds) only. Bavistin also yielded maximum percentage of seed germination (85.1) of cauliflower followed by Dithane M-45(80) and Blitox 50(73). The results of this experiment were similar to the results of other scientist's work (Khan *et al.* 1994).

Therefore, it was evident (Table 2 and Table 3) that Bavistin fungicide at 500 PPM concentration is best to eleminate seed mycoflora of both mustard and cauliflower. Moreover this fungicide enhanced the germination ability of the tested seeds.

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