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## ASSESSMENT OF FUNGI ON OIL SEEDS AND EFFECT OF FEW FUNGAL TOXIN ON SEED GERMINABILITY

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Research Guide.

### ABSTRACT

Seed mycoflora of five different oil seeds such as groundnut, mustard, safflower, sesame and safflower were isolated by using GNA media and the mycoflora mainly dominated by four species of *Aspergillus*, three species of *Fusarium*, two species of *Curvularia*. Similarly the effect of culture filtrate of *Aspergillus niger*, *A. ustus*, *Curvularia lunata*, *Fusarium dimerum* and *F. oxysporum* was observed and the culture filtrate of fungi showed more or less impact on seed germinability on tested oil seeds.

**KEY WORDS:** Isolation, fungi, germinability, culture filtrate.



### INTRODUCTION

Among various factors that affect seed health, the most important are the seed borne fungi that not only lower seed germination, but also reduce seed vigor resulting in low yield. Healthy seed plays an important role not only for successful cultivation but also for increasing yield of crop. Aslam R., et. al., (2005). The most commonly reported negative impact of seed borne fungi include reduction in storage life span of seeds, seed rotting, reduction in seed vigour, reduction in germination. Moisture and temperature conditions favour the fungal growth and increases physiological and physical conditions vulnerability of fruit, seeds or seedling infection. Seed borne fungi can weaken and predispose seeds and seedling due to variety of fungi.

Many seed-borne fungi are known to produce toxic metabolites which affect germination and vigour (Sharma and Sharma 1983). Singh and Agarwal (1986) observed the maximum reduction in seed germination of soybean due to the association of mycoflora. Sharma et al., (1995) observed the fungal metabolites of three seed-borne fungi, *Alternaria alternata*, *Cladosporium herbarum* and *Trichothecium roseum* reduced the germination of soybean seeds. Kashinath B and Subrata R. (2002) reported gradual decrease in field fungi with simultaneous increase in storage fungi results in reduction of germinability in groundnut. Saleh, et.al., (2003) observed decrease in percent seed germination of Mustard with increasing period of storage due to maximum incidence of *Alternaria alternata*. Afzal et.al., (2010) reported that, *F. solani*, *F. moniliforme* were found to reduce the seed germination by 10-20% and seedling mortality by 10-20% in seeds of different Sunflower cultivars.

## MATERIALS AND METHODS:

### Collection of samples, detection and identification of seed mycoflora:

Seed samples were collected from fields, store houses, market places and seed companies and as per method described by Neergaard (1973). The seed mycoflora of oil seeds was isolated on GNA media as recommended by ISTA (1966), De Tempe (1970), Neergaard (1973) Agarwal (1976) and Pitt and Hocking (2009). The identification was made with the help of manuals, as per Nelson, et. al., (1983); Singh, et. al.,(1991); Mukadam, D.S. (1997) and Mukadam, D.S. et. al.,(2006).

**Seedling abnormality:** Some of the isolated fungal toxins were tested for their effect on seed germination.

### Production of toxin:

The method of crude toxin preparation was done as per Bhagawan M. Waghmare(1996).

**Assay:** The effect of pathogenic fungi on seeds germination and seedling vigour was assessed by soaking the test seeds in respective culture filtrates for 24 hours. Ten seeds were placed on moist blotters in sterilised petriplates at 25±20C. Data on seed germination, radical and plumule length were recorded after a period of five days. The seeds soaked in distilled water are served as control.

**EXPERIMENTAL RESULTS:** Seed mycoflora of five different oil seeds such as groundnut, mustard, safflower, sesame and safflower were isolated by using GNA media and the results are given in table no.1.

It is observed that total thirteen fungi were isolated from test oil seeds. Mycoflora mainly dominated by four species of *Aspergillus*, three species of *Fusarium*, two species of *Curvularia* followed by *Cladosporium cladosporidies*, *Alternaria alternata*, *Helmenthosporium tetramera* and *Penicillium notatum*, which occur comparatively higher incidence. The qualitative and quantitative mycoflora varies in studied oil seeds. Umatale (1995), Pensalwar et al. (1996), Borker and Shinde (1989), Sharma and Singh (1992) and Abdul Latif, et.al., (2006) also found the similar observations on the oil seeds they studied.

The effect of culture filtrate of *Aspergillus niger*, *A. ustus*, *Curvularia lunata*, *Fusarium dimerum* and *F. oxysporum* was observed on Groundnut, Mustard, Safflower, Sesame and Sunflower and results are given in table 2.

According to the results, it is observed that, the culture filtrates of test fungi caused inhibition of seed germination. *Aspergillus ustus* caused maximum inhibition of germination in sunflower and the same was the case in groundnut, sesame, safflower and mustard respectively. *Fusarium dimerum* showed the maximum inhibition of seed germination in sunflower and the same was the case in groundnut, safflower and mustard. Whereas, the *Fusarium oxysporum* is observed as least pathogenic for the tested oil seeds but it has its maximum effect of seed germination in groundnut. The similar results were observed in groundnut by Gorgile (2011).

*Curvularia lunata* showed its impact on ground nut and seasame and all the tested oil seeds show more or less inhibition in germination by *Aspergillus niger*

**Table 1. Incidence of fungi from different oil seeds on Glucose Nitrate Agar media.**

Fungi	Groundnut	Mustard	Safflower	Sesame	Sunflower
<i>Alternaria alternata</i>	10	20	15	15	10
<i>Aspergillus flavus</i>	05	10	10	05	10
<i>Aspergillus glaucus</i>	40	15	05	10	15
<i>Aspergillus niger</i>	20	10	05	10	20
<i>Aspergillus ustus</i>	20	25	25	10	05
<i>Cladosporium cladosporidies</i>	20	10	30	20	05
<i>Curvularia lunata</i>	15	10	10	05	05
<i>Curvularia tetramera</i>	20	10	30	20	10
<i>Fusarium dimerum</i>	05	05	05	10	05
<i>Fusarium moniliforme</i>	20	10	10	05	10
<i>Fusarium oxysporum</i>	20	10	15	--	15
<i>Helmenthosporium tetramera</i>	10	05	10	10	05
<i>Penicillium notatum</i>	05	10	--	05	--

**Table 2. Effect of fungal culture filtrate on seedling abnormalities of different oil seeds.**

Name of Fungi	Groundnut				Mustard				Safflower				Sesame				Sunflower			
	% inhibition on Germn	Seed Rot	Root Condtn	Shoot condtn	% inhibition on Germn	Seed Rot	Root Condtn	Shoot condtn	% inhibition on Germn	Seed Rot	Root Condtn	Shoot condtn	% inhibition on Germn	Seed Rot	Root Condtn	Shoot condtn	% inhibition on Germn	Seed Rot	Root Condtn	Shoot condtn
<i>Asp. nig</i>	50	25	Tip Black	Rot	45	20	Tip Black	Stunted	50	30	Tip Black	Rot	55	30	Stunted	Stunted	40	20	Black	Rot
<i>Asp. ust</i>	70	40	Brown	Stunted	55	30	Brown	Stunted	60	30	Black	Stunted	65	25	Tip Rot	Stunted	75	50	Rot	Brown
<i>C.Jun</i>	55	20	Black	Stunted	50	30	Black	Rot	60	40	Normal	Rot	40	30	Rot	Stunted	40	25	Normal	Black
<i>F. dim</i>	60	45	Tip Black	Rot	50	25	Tip Black	Black	55	30	Tip black	Tip black	35	20	Tip Rot	Stunted	75	50	Rot	Rot
<i>F. oxy</i>	30	20	Normal	Stunted	25	15	Stunted	Normal	20	10	Normal	Normal	25	20	Tip Rot	Normal	30	15	Normal	Normal
<b>Control</b>	20	--	Normal	Stunted	20	10	Tip Rot	Normal	20	10	Normal	Normal	--	10	Tip Rot	Normal	--	30	Normal	Normal

**REFERENCES:**

- 1.Afzal, R., Mughal, S., Munir, M., Kishwar Sultana, Qureshi, K., Muhammad, A. and Laghari, M. K. (2010). Mycoflora associated with seeds of different sunflower cultivars and its management. Pak J. Bot. 42(1): 435-445.
- 2.Agarwal, V. K. (1976). Techniques for the detection of seed borne fungi. Seed Res. 4: 24- 31.
- 3.Aslam, R. M., Mumtaz. A. P., Mubeen, A. L., Shah, G. S. and Khalil, A. K. (2005). Studies on seed-borne fungi of wheat in Sindh province and their effect on seed germination. Pak. J. Bot. 37(1): 181-185.
- 4.Borkar, S. G. and Shinde, R. (1989). Detection of externally seed-borne *Alternaria carthami* on safflower seeds. Agri. Sci. Dig. 9(3):120-122.
- 5.DeTempe, J. (1970). Testing cereals seeds for *Fusarium* infection in the Netherlands. Prof. Int. Seed. Test. Ass.

33: 193-200.

6. Gorgile (2011).

7. ISTA (1966). International rules for seed testing. Pro. Inst. Seed Test. Assoc. 31:1-152.

8. Kashinath, B. and Subrata, R. (2002). Deteriorative changes of maize, groundnut and soybean seeds by fungi in storage. Mycopathologia. 155: 135–141,

9. Mukadam, D. S. (1997). The illustrated kingdom of fungi. Aksharganga Prakashan, Aurangabad. (M.S.)

10. Mukadam, D. S., Ashok Chavan., Patil, M. S. and Anjali R. Patil (2006). The illustration of fungi. Saraswati Printing Press, Aurangabad. (M.S.) India.

11. Neergaard, P. (1973). Detection of seed borne pathogen by culture test seed. Sci. and Tech. 1: 217-254.

12. Nelson, P. E., Toursoun, T. A. and Maracas, W. F. O. (1983). Fusarium species an illustrated manual of dent. The Pennsylvania. State Uni. Press Uni. Part, Pennsylvania. pp. 203.

13. Saleh, A. K. M., Latif, M. A., Khan, M. A. I., Rahman, H. and Uddin, M. K. (2003). Prevalence of fungi in mustard seeds grown and stored at different location of Dhaka region, Bangladesh and their control. Pak. J. of Bio. Sci. 6(11): 995-997.

14. Sharma, A. K. (1995). Effect of metabolites of some seed-borne fungi in seed mycoflora and seed germination of Soybean. Jr. of Hill Res. 8 (2): 165-168.

15. Sharma et al., (1995)

16. Sharma T. K., Agarwal and Singh, D. (1992). Fungi associated with seeds of mustard grown in Rajasthan and their phytopathological effects. Jr. of Ind. Biol.Soc. 71(1-4):91-94.

17. Sharma, A. K. and Sharma, K. D. (1983). Effect of fungal metabolites on seed germination of sweet fennel seeds. Toxicology letters. 17(1-2): 81–84.

18. Singh D. P. and Agarwal, V. K. (1986). Purple stain of Soybean and seed viability. Seed Res. 14 (1): 126.

19. Singh, K., Frisvad, J. C., Thrane, U. and Mathur, S. B. (1991). An illustrated manual on identification of some seed borne Asprgilli, Fusaria, Penicillia and their mycotrins. Dan Govt. Inst. Beedpath for Devel Countries. pp. 133.

20. Umatale M. V. (1995). Studies on fungal enzymes and toxins biodeterioration of Oil Seeds. Ph.D. Thesis, Dr. B.A.M.U. Aurangabad (MS).

21. Waghmare, B. M. (1996). Studies on seed-borne species of Fusarium (link) from different plant seeds. Ph.D. thesis submitted to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. (Maharashtra).

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