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Full Length Research Article

FUNGI FROM DIFFERENT SEED CATEGORIES OF CHICKPEA

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ABSTRACT

Seed is inhabited by numerous fungi; external and internal. These fungi cause alteration in seed shape, texture and color. These symptomatic morphological features are because of associated seed mycoflora of the seed. Chickpea (*Cicer arietinum* L.) seeds categorized as bold, shriveled and discoloured. Ten seeds of each category were placed on moist blotter and Agar Plates respectively and their seed mycoflora was recorded. Total sixteen fungi were recorded from all categories of seeds. The results indicate that, discoloured seeds showed maximum mycoflora with maximum percent incidence; followed by shriveled and bold seeds. Bold, shrivelled and discoloured seeds are pathogenic with feeble germinability and emergence due to associated seed mycoflora.

INTRODUCTION

Chickpea is important for its malic and oxalic acids useful in intestinal disorders. It contains protein 20.5g/ 100g of seeds and carbohydrates 59.6 g/ 100g of seeds with thiamin (0.30mg), riboflavin (0.15mg), niacin (2.9mg), vitamin C (3mg) and phosphorous (312 mg) (Shakuntala Manay and M. Shadaksharaswamy,1987). Various seed borne fungi affect Chickpea leading to loss in quality and quantity of the seed. Texture, shape and color of the seed indicate health of seed. Overtly bold, shriveled and discolored seeds are manifestation of covert seed mycoflora. Hence bold, shriveled and discolored seeds are used to screen mycoflora. Healthy seed is necessary for healthy plant. Seed mycoflora is responsible for deformation, discoloration of the seed. This deformation and discolouration imply damage to seed coat, embryo and seed biochemistry. Hence it is important to understand seed mycoflora.

MATERIALS AND METHODS

Seeds of the Chickpea were collected as described by Paul Neergaard (1977) from different sources to make composite sample. These seeds were categoriesed into bold, shriveled, discolored and plated on Agar and moist blotter plates for fungal screening.

Moist blotter Plate method

A pair of white blotter paper of 8.5 cm diameter was jointly soaked in sterile distilled water and placed in pre-sterilized borosil glass Petri-plates of 10 cm diameter. Ten seeds were placed at equal distance aseptically on the moist blotter paper. The plates were incubated at room temperature for ten days. On eleventh day the seeds were examined under microscope for the preliminary determination of seed mycoflora. The seed borne fungi found on each and every seed were isolated and identified.

Agar Plate method

Twenty five ml of sterilized PDA medium of pH 5.6 poured in pre-sterilized borosil glass Petri-plate of 10 cm diameter. The Petri-plates were allowed to cool at room temperature; ten seeds of Chickpea were placed at equidistance under aseptic condition. After ten days of incubation the seeds were examined under microscope for the preliminary determination of seed mycoflora. The seed borne fungi found on each and every type of seed were isolated and identified.

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Table: Incidence of seed mycoflora of Chickpea (*Cicer arietinum* L.) seeds of different categories by blotter (B) and agar (A) Plate methods (After ten days of incubation)

Sr.No.	Seed mycoflora	Incidence of seed mycoflora (%)					
		Bold seeds		Shriveled seeds		Discolored seeds	
		B	A	B	A	B	A
1	*Alternaria alternate*	10	10	25	09	10	12
2	*Alternaria tenuis*	21	10	48	45	36	25
3	*Aspergillus carbonarius*	10	00	00	20	55	21
4	*Aspergillus flavus*	56	60	80	70	55	77
5	*Aspergillus fumigatus*	40	30	50	30	40	40
6	*Aspergillus nidulans*	20	22	40	18	55	23
7	*Aspergillus niger*	34	58	50	38	35	63
8	*Cladosporium spp.*	00	10	00	03	00	00
9	*Colletotrichum truncatum*	00	03	00	00	00	01
10	*Curvularia lunata*	40	06	40	20	30	19
11	*Drechslera tetramera*	50	12	50	40	50	55
12	*Fusarium moniliforme*	30	20	30	10	50	30
13	*Fusarium oxysporum*	21	25	50	35	30	28
14	*Macrophomina phaseolina*	10	00	22	15	15	10
15	*Penicillium spp.*	12	00	30	06	15	10
16	*Rhizopus stolonifer*	00	12	00	00	02	12

Isolation and identification of seed borne fungi of different seed categories

The isolated seed borne fungi of test pulses were identified on the basis of colony character, texture, color and sporulation with naked eye and microscopically. Identifications were confirmed with the help of authentic manuals (Subramanian, 1971; Neergaard and Mathur, 1980; Jha, 1993 and Mukadam, 1997). Pure cultures of the identified fungi were made and maintained on PDA (Potato Dextrose Agar) slants.

RESULT AND DISCUSSION

Total sixteen fungi were reported on all categories of seeds. Incidence of seed mycoflora was maximum on discoloured seeds but percent incidence was maximum on shriveled seeds. Predominant fungi were *Aspergillus flavus* (80 %), *A. niger* (63 %), *A. fumigatus* (50 %), *Drechslera tetramera* (55 %), *Aspergillus nidulans* (55 %) and *Fusarium oxysporum* (50 %). Other seed-borne fungi were; *Colletotrichum truncatum*, *Cladosporium* spp., *Rhizopus stolonifer*, *Macrophomina phaseolina*, *Aspergillus carbonarius*, *Alternaria alternata* and *Alternaria tenuis*. Seed-borne fungi like, *Cladosporium* spp. was completely absent on discoloured seeds but showed very less presence on shriveled seeds (3 % agar, 10 % bold seeds, agar). Similarly *Colletotrichum truncatum* was absent on shriveled seeds with less presence on discoloured seeds (1%) and bold seeds (3%). *Rhizopus stolonifer* was absent on shriveled seeds with less percent incidence (2%) on discoloured seeds. Agar plate showed over all more incidence of seed mycoflora. These seed borne fungi causing deformities and ultimately retarding seed health need to be controlled. Knowing the seed mycoflora it is possible to opt relevant control measures. These seed borne fungi could be controlled through biological methods.

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