

# Mycoflora associated with Pigeon pea and Chickpea

D. P. Patil<sup>1</sup>, P. V. Pawar<sup>2</sup> and S. M. Muley<sup>1</sup>

<sup>1</sup>Post Graduate Department of Botany, Shivaji Mahavidyalaya, Udgir Dist. Latur (M.S.), India

<sup>2</sup>Department of Botany, Madhavrao Patil Mahavidyalaya, Palam, Dist. Parbhani (M.S.), India

## Abstract

Pigeonpea (*Cajanus cajan*.) and Chick Pea (*Cicer arietinum*) are major pulse crops grown in India. The seed mycoflora was screened by using agar plate method. seeds of varieties of these pulse crops was used in the study and results were obtained from untreated and treated seeds. The untreated seeds were found to be associated with highest percent incidence of mycoflora. In case of untreated seeds the percent incidence of *Aspergillus flavus* (30%) was the highest followed by *A. niger* (25%), *Penicillium notatum* (20 %), *Cladosporium herbarum* (18%), where as all other fungi were within the range of (3 to 15%).

**Keywords:** Pigeon pea, Chick pea, mycoflora, untreated, treated.

## INTRODUCTION

Pulse seeds are reported to carry many moulds both in fields and during storage [1]. The association of fungi adversely affects quality and health of the seeds. The term "seed mycoflora or seed-borne fungi" is used for both qualitative as well as quantitative analysis of fungi occurring on or in the seeds [2]. The fungi associated with seeds at the stage of harvest and under storage bring about several undesirable changes making them unfit for consumption and sowing. Attempts were made during present investigation to study mycoflora of pulses.

## MATERIALS AND METHODS

In this method, 20 ml of autoclaved Martin Rose Bengal Agar medium was poured in pre-sterilized corning glass petriplates of 10cm diameter. On cooling the medium, 10 seeds per petriplates were equispaced aseptically. The plates were incubated at 25±2 °C under diurnal condition. On seventh day of incubation the seeds were examined under stereoscopic microscope for the preliminary determination of fungal growth on them. Detailed examination of fungal characters was done under compound microscope and their identification was confirmed with the standard manuals [3 and 4]. Pure culture of these fungi was prepared and maintained on PDA slants for further study.

In order to isolate only internal seed mycoflora, seeds were pretreated with 0.1% solution of Mercuric chloride (HgCl<sub>2</sub>) for two minutes, subsequently thoroughly washed thrice with sterile distilled water and placed on agar plates. Seeds without any such pretreatment were also employed for the study of total (Internal and external) seed mycoflora.

## RESULTS AND DISCUSSION

Isolation of seed mycoflora from pigeon pea was done critically and results are given in the form of table-1. In order to study the total association of seed borne fungi, wild variety of pigeon pea were placed on agar plate. The seeds pre-treated with 0.1 % Mercuric chloride solutions were placed on agar plate for the isolation of internal mycoflora. It is clear from the obtained results that sixteen fungi appeared on treated seeds namely *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger*, *Botrytis cinerea*., *Chaetomium globosum*, *Cladosporium herbarum*, *Curvularia lunata*, *Fusarium oxysporum*, *Fusarium moniliforme*, *Fusarium roseum*, *Macrophomina phaseolina*, *Penicillium notatum*, *Phytophthora sp.*, *Rhizoctonia solani* and *Rhizopus stolonifer*. On the untreated seeds of pigeonpea *Aspergillus flavus* (25%) gave highest percentage and followed by *Cladosporium herbarum* (18%), *Penicillium notatum* (20%) and *Aspergillus niger* (25%) where as all other fungi were within the range (3 to 15%). In treated seeds of pigeon pea only eight fungi were found. *Aspergillus flavus* shows maximum percentage incidence (5%) followed by *Fusarium oxysporum* (4%) and *Aspergillus niger*, *Fusarium moniliforme*, *Fusarium roseum*, *Macrophomina phaseolina*, *Phytophthora sp.* and *Rhizoctonia solani* were found (2%).

In all the eighteen fungi were found to be associated with the seeds of Chickpea (Table 2). In case of untreated seeds the percent incidence of *Aspergillus flavus* (25%) was the highest followed by *Aspergillus niger* (20%), *Penicillium notatum* (18 %), *Cladosporium herbarum* (15%), where as all other fungi were within the range of (2 to 12%). In treated Chickpea seeds only six fungi were recorded with *Aspergillus flavus* (8%) showing maximum percentage incidence followed by *Aspergillus niger* (4%) where as *Aspergillus carboniferus*, *Fusarium oxysporum*, *Penicillium notatum* and *Phytophthora sp.* Showing minimum percentage (2 %). Deo and Gupta (1980) [5], Dwivedi and Shukla (1990) [6], Iqbal Singh and Chohan (1975) [7], Jain and Patel (1969) [8], Kumar and Patanik (1985) [9], Kumar and Srivastava (1985) [10], Kumbhar Agnihotri and Gupta (1987) [11], Lokesh, Haremath and Hegde (1987) [12], Nakkeeran and Devi (1997) [13] and Suhag (1973) [14] reported more or less similar results.

The results of the present investigation emphasize that the percentage incidence of *Aspergillus flavus* was significantly high on

Received: April 03, 2012; Revised: May 05, 2012; Accepted: June 02, 2012.

\*Corresponding Author

D. P. Patil

Post Graduate Department of Botany, Shivaji Mahavidyalaya, Udgir Dist. Latur (M.S.), India

Email: [patildp@gmail.com](mailto:patildp@gmail.com)

seeds of pigeonpea and chickpea followed by *Aspergillus niger* and *Penicillium notatum*. It was also evident that an untreated seeds

showed the maximum percentage incidence as compared to treated seeds.

Table 1. Fungi associated with seeds of pigeon pea

Sl. No.	Seed mycoflora	Percent incidence	
		Untreated	Treated
1	<i>Alternaria alternata</i>	3	-
2	<i>Aspergillus flavus</i>	30	5
3	<i>Aspergillus. niger</i>	25	2
4	<i>Botrytis cineria.</i>	3	-
5	<i>Chaetomium globosum</i>	5	-
6	<i>Cladosporium herbarum</i>	18	-
7	<i>Curvularia lunata</i>	3	-
8	<i>Fusarium oxysporum</i>	8	4
9	<i>Fusarium moniliforme</i>	7	2
10	<i>Fusarium roseum</i>	7	2
11	<i>Macrophomina phaseolina</i>	12	2
12	<i>Penicillium notatum</i>	20	-
13	<i>Phytophthora cinnamomi.</i>	5	2
14	<i>Pythium sp.</i>	3	-
15	<i>Rhizoctonia solani</i>	9	2
16	<i>Rhizopus stolonifer</i>	14	-

Table 2. Fungi associated with seeds of Chickpea

Sl. No.	Seed mycoflora	Percent incidence on seed	
		Untreated	Treated
1	<i>Alternaria alternata</i>	4	-
2	<i>Aspergillus flavus</i>	25	8
3	<i>Aspergillus. niger</i>	20	4
4	<i>Aspergillus carboniferus</i>	8	2
5	<i>Cladosporium herbarum</i>	15	-
6	<i>Chaetomium globosum</i>	4	-
7	<i>Curvularia lunata</i>	10	-
8	<i>Fusarium moniliforme</i>	8	-
9	<i>Fusarium. oxysporum</i>	12	2
10	<i>Fusarium. semitectum</i>	2	-
11	<i>Fusarium roseum</i>	4	-
12	<i>Mucor sp.</i>	2	-
13	<i>Penicillium citrinum</i>	18	2
14	<i>Phytophthora sp.</i>	8	2
15	<i>Pythium sp.</i>	2	-
16	<i>Rhizoctonia solani</i>	4	-
17	<i>Rhizopus stolonifer</i>	10	-
18	<i>Trichoderma viride</i>	2	-

## REFERENCES

- [1] Rangaswami, G. 1966. Agricultural Microbiology. Asian Publication, Bombay.
- [2] Neergaard Paul. 1973. Detection of seed borne pathogen by culture test. *Seed Sci. and Technol.* 1:217-254.
- [3] Ellis, M.B. 1971. Dematiaceous hypomycetes. Cab International, Wallingford.

- [4] Mukadam, D. S. 1997. The illustrated kingdom of fungi. Akshar Ganga Prakashan, Aurangabad.
- [5] Deo, P.P. and Gupta, J.S. 1980. A note on the mycoflora associated with seeds of Gram (*Cicer arietum* L.) during storage. *Seeds Res.* 8(1): 83 – 84.
- [6] Dwivedi, S.N. and Shukla, T.N. 1990. Mycoflora of Gram seed in different agro-climatic regions and their pathology. *Indian Phytopathology* Vol. 43 : 98 – 99.
- [7] Iqbal Singh and Chohan, J.S. 1975. Fungi associated with seed of Gram (*Cicer arietinum*) and control of pathogenic ones. *Ind. J. Mycol. Phy. Patho.* 6 : 71 – 72.
- [8] Jain, J. P. and J. N. Patel, 1969. Seed mycoflora of Gaur their role in emergence and vigour of seedling and efficiency of fungicides. *India Phytopath.* 22 (2): 245-250.
- [9] Kumar, K. and Patanik, P. 1985. Seed borne nature of *Alternaria alternata* in Pigeon pea in detection and control. *Indian Journal of Plant Pathology* 3(1): 69 – 73.
- [10] Kumar, K. and Srivastava, S.S.L. 1985. Fungi associated with Pigeon pea seeds, their effects and control. *Indian Journal of Plant Pathology* 3(1): 53 – 65.
- [11] Kumbar, G.R., Agnihotri, J.P. and Gupta, A.K. 1987. Seed mycoflora of Chickpea (*Cicer arietinum* L.) their effect on germination and vigour of seedling and their control. *Indian Bot. Rept.* 6(2) : 87 – 94.
- [12] Lokesh, M.S., Haremath, R.V. and Hegde, R.K. 1987. Seed mycoflora of Red gram (*Cajanus cajan* L. Mills P.). *Plant Pathology News letter* 5(1 – 2) pp 31.
- [13] Nakkeeran, S. and Devi, R. 1997. Seed borne mycoflora of Pigeon pea and their management. *Pl. Dis. Res.* 12(2) 197 – 199.
- [14] Suhag, L.S. (1973). Mycoflora of Gram (*Cicer arietinum*) seeds : Pathology and Control. *Indian J. Mycol & Plant Path.* 3 : 40 – 43.