RESEARCH PAPER

ADVANCE RESEARCH JOURNAL OF
CROP IMPROVEMENT
Volume 10 | Issue 1 | June, 2019 | 1-4
ISSN-0976-5603

DOI :
10.15740/HAS/ARJCI/10.1/1-4
Visit us: *www.researchjournal.co.in*

Collection of pigeonpea seeds of different varieties from places of different agro-climatic zones and detection of seed borne mycoflora associated with it, by dry seed inspection method

■ S. N. Sharma

ABSTRACT : Pigeonpea is important pulse crop of this country. The crop is extensively grown in Maharashtra, Uttar Pradesh, Madhya Pradesh, Karnataka, Andhra Pradesh and Gujarat. Seed is the most important input for crop production. Pathogen free healthy seed is urgently needed for desired plant populations and good harvest. Pigeonpea seed carry many mycoflora both in field as well as in storage as mould seed. The association of fungi adversely affects quality and health of the seeds. The seed samples of 19 varieties of pigeonpea were collected from various places in different agro-climatic zones for the detection of seed mycoflora associated with them. These samples were stored at room temperature (20-35°C). The presence of fungal flora associated with pigeonpea seed was detected by using the ISTA (1985) method. This involves the method - Dry seed inspection method. Discolouration of seed surface was observed in only 7 varieties *viz.*, UPAS -120, MA – 97, Pant A-3, ICP-8862 Pusa- 9 and Bahar. Other 12 varieties show no symptoms on their seeds.In dry seed inspection light to dark discolouration within range of 1.0 to 7.0 was found in 8 varieties like UPAS-120, Pant A-3, MA-97, T-21, Pusa-9, ICP-8862, C-11 and Bahar.

KEY **W**ORDS : Pigeonpea, Mycoflora, Seed borne fungi, Agro-climatic zonnes

How to cite this paper : Sharma, S.N. (2019). Collection of pigeonpea seeds of different varieties from places of different agro-climatic zones and detection of seed borne mycoflora associated with it, by dry seed inspection method. *Adv. Res. J. Crop Improv.,* **10** (1) : 1-4, **DOI : 10.15740/HAS/ARJCI/10.1/1-4**.

Paper **H**istory : **Received :** 01.04.2019; **Revised :** 01.05.2019; **Accepted :** 18.05.2019

Author for correspondence:
S. N. Sharma
Department of Plant Pathology, N.P.G. College, Barhalganj, **Gorakhpur (U.P.) India**
Email: drsnsharam4@gmail.com

Pigeonpea [*Cajnus cajan* (L.) Millisp] is an important pulse crop of this country. It belongs to the family Fabaceae (Papilionaceae) and probably orginiated in india. In India, total pulse area and production during 2017-18 has been >299 Lha and 252 Lt, respectively. Out of the total area >74 Lha is confined to Madhya Pradesh alone, earning a prime status in pulse production commodity contributing a remarkable 25 per cent of the country's pulse area with 32 per cent production, thereby ranking first both in area and production followed by Rajasthan and Maharashtra with 13 per cent each and Uttar Pradesh at 9 per cent. The country's total area coverage and production of Arhar has been about 44 Lha and 42 Lt, respectively. As usual

Maharashtra has contributed >28 per cent of area and 25 per cent of total production during this period. (Anonymous, 2018). The crop is extensively grown in Maharashtra, Uttar Pradesh, Madhya Pradesh, Karnataka, Andhra Pradesh and Gujarat. Nutritionally, it is very rich in protein and good source of amino acids, minerals and vitamins. Main constituents of pigeonpea per (100g of seed) are protein (21.9g), carbohydrate (72.7g) oil (1.5g) and minerals.

Seed is the most important input for crop production. Pathogen free healthy seed is urgently needed for desired plant populations and good harvest. Many plant pathogens are seed-borne, which can cause enormous crop losses; reduction in plant growth and productivity of crops (Williams and McDonald, 1983; Kubiak and Korbas, 1999; Dawson and Bateman, 2001 and Islam *et al.*, 2009).

Pulse seeds are reported to carry many moulds both in fields and during storage. The association of fungi adversely affects quality and health of the seeds. The term "seed mycoflora or seedborne fungi" is used for both qualitative as well as quantitative analysis of fungi occurring on or in the seeds .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. The present investigation was undertaken to find out the seed borne fungi associated with the seeds of selected pigeonpea by dry seed inspection method.

Research Procedure

The materials of the present investigation were 19 varieties of pigeonpea [*Cajanus cajan* (L.) Millsp]. Seed of these pigeonpea varieties were collected and studies were made with reference to the mycoflora associated with them. The research work was carried out in the Department of Agricultural Botany, S.D.J Post Graduate College, Chandeshwar Azamgharh.

The seed samples of 19 varieties of pigeonpea were collected from various places in different agro-climatic zones for the detection of seed mycoflora associated with them. These samples were stored at room temperature (20-35°C). The presence of fungal flora associated with pigeonpea seed was detected by using the ISTA (1985) method. This involves the method - Dry seed inspection method

Inspection of dry seeds - Dry seeds were examined by naked eyes and also with the help of magnifying hand lens to detect the presence of fungal symptoms such as discolouration, deformation and spots on the seed surface. Then seeds were classified in three categories- Apparently healthy seeds, Discoloured seeds and shrivelled seeds. On the Basis of their size, shape and colour, seeds of each category were further divided into two groups.

Research Analysis and Reasoning

Seeds of different pigeonpea varieties collected from different agro-climatic zones (Table 1) were analysed for detection of seed mycoflora.

Detection of mycoflora associated with pigeonpea seeds were carried out and findings are presented as by inspection of dry seeds- Random samples of freshly harvested seeds of pigeopea varities were taken. The seeds were examined for discolouration deformities and presence of fungal fructifications on seed surface through naked eyes and with the help of magnifying hand lens. Data presented in Table 2 showed that discolouration of seed surface ranged from 1.0 per cent to 7.0 per cent in pigeonpea varieties. Maximum frequency (7.0) of discolouration was observed in UPS-120 followed by T-21(6.0%), MA-97(5.0%) while Bahae showed the minimum frequency of discoluration . The other varieties namely GT-1, T-7, T-17, ICP-151, Manak, Pusa-74, Narendra 1, BDN2, ICP-335, Mukhta and NP15 were completely devoid of seed discolouration. At same time no fungal fructification were observed on the seeds on seed of any varieties under study.

Among the various pulse-crop, pigeonpea (*Cajanus cajan*) is of great importance because of its high protein content good quality and taste. For better production of a crop, good quality seed and good management practices are required. One of the important point in seed quality is related to various pathogens causing diseases to the plants. The present investigation was carried with pigeonpea seed with different varieties, their nature and effect on seed. In this experiment the seed borne mycoflora of 19 pigeonpea varieties were studied with following ISTA (1985) by dry seed inspection method.

Dry seed inspection:

Discolouration of seed surface was observed in only 7 varieties *viz.*, UPAS -120, MA – 97, Pant A-3, ICP-8862 Pusa- 9 and Bahar. Other 12 varieties show no symptoms on their seeds. No varieties showed any

Table 1 : Name of pigeonpea varieties and place of collection of seeds

Sr. No.	Varities	Place of collection
1.	Pant A-3	Pantnagar
2.	ICP-151	Pantnagar
3.	BDN2	Pantnagar
4.	ICP-335	Pantnagar
5.	UPHAS-120	Faizabad (U.P)
6.	Prabhat	Faizabad (U.P)
7.	T-21	Faizabad (U.P)
8.	Narendra-1	Faizabad (U.P)
9.	MA-97	Faizabad (U.P)
10.	T-7	Azamgarh (U.P)
11.	T-17	Azamgarh (U.P)
12.	ICP-8862	Azamgarh (U.P)
13.	PUSA-9	Azamgarh (U.P)
14.	Manak	Gorakhpur (U.P)
15.	C-11	Gorakhpur (U.P)
16.	Bahar	Gorakhpur (U.P)
17.	NP(WR)15	Gorakhpur (U.P)
18.	Mukta	Mau (U.P)
19.	GT-1	Mau (U.P)

Table 2 : Frequencies (%) of discoloured dry seeds in different varieties of pigeonpea

Sr. No.	Varieties	Discoloured seeds (%)
1.	UPAS-120	7.0
2.	Pant A-3	4.5
3.	GT-1	-
4.	MA-97	5.0
5.	T-21	6.0
6.	ICP-151	
7.	T-7	-
8.	T-17	-
9.	Pusa-9	2.5
10.	ICP-8862	3.5
11 .	Manak	-
12.	C-11	1.5
13.	Pusa-74	-
14.	Narendra-1	
15.	BDN-2	-
16.	Bahar	1.0
17.	ICP-335	-
18.	Mukhta	-
19.	NP(WR)15	-

fructification on the seeds. Discolouration of seeds have been reported by several workers if different crops. In dry seed inspection light to dark discolouration within range of 1.0 to 7.0 was found in 8 varieties like UPAS-120, Pant A-3, MA-97, T-21, Pusa-9, ICP-8862, C-11 and Bahar (Dwivedi and Shukla, 1990 and Ghangaokar and Kshirsagar, 2013).

Literature Cited

Anonymous (2018). *Annual progress report 2017-18*, DPD, Bhopal (M.S.) India.

Dawson, W.A.J.M. and Bateman, G. L. (2001). Bateman. Fungal communities on roots of wheat and barley and effects of seed treatments containing fluquinconazole applied to control take-all. *Plant Pathol.*, **50**: 5-82.

Dwivedi, S.N. and Shukla, T.N. (1990). Mycoflora of gram seed in different agro-climatic regions and their pathology. *Indian Phytopathol.*, **43** : 98 – 99.

Ghangaokar, Narayan M. and Kshirsagar, Ayodhya D. (2013). Study of seed borne fungi of different legumes. *Trends in Life Sci. Internat Peer- Revi. J.*, **2** (1): 32-35.

Islam, S.M.M., Masum, M. M. I. and Fakir, M. G. A. (2009). Prevalence of seed-borne fungi in sorghum of different locations of Bangladesh. *Scientific Research & Essay*, **4** (3) : 175-179.

ISTA- International Seed Testing Association (1985). International seed testing association rule book. *Seed Sci. Technol.*, **13**(2): 299-520.

Kubiak, K. and Korbas, M. (1999). Occurrence of fungal diseases on selected winter wheat cultivars. *Postepy Ochronie Roslin*, **39** (2): 801-804.

Williams, R.J. and D. McDonald (1983). Grain molds in the tropics: Problems and Importance. *Annual Review of Phytopathol.*, **21**: 153-178.