

Seed mycoflora of pigeonpea (*Cajanus cajan* (L.) Mills.) and its management

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ABSTRACT

Seeds of thirty-five genotypes were collected from RRS, GKVK, Bangalore, during *Kharif* 2001 and analyzed for seed mycoflora by employing standard blotter technique. The studies revealed that pigeonpea seeds were infecting with six fungi *Viz.*, *Alternaria* sp, *Aspergillus flavus*, *A. niger*, *Helminthosporium* sp. *Fusarium* sp. and *Cladosporium* sp. Amongst these six fungi infected in pigeonpea seeds, *Alternaria* sp had a maximum of 75% infection in PUSA2001-1 genotype followed by *Aspergillus flavus* (72% infection in S₁) *A. niger*, (Maximum of 16% infection in AL 201) *Helminthosporium* sp. (Maximum of 60% infection in PUSA 2001-1) and *Cladosporium* sp (Maximum of 76% infection in TT 101) and least was *Fusarium* spp. (Maximum of 40% infection in H 88-25). The seed treatments like hot water treatment solar heat treatment and chemical treatments were studied, it reveals that hot water treatment of seeds at 35 °C for 30 minutes found effective in reducing seed infection. Solar heat treatment on terraces for 2 hours reduces the seed infection. Emisan (2 g/Kg) seed and mancozeb (2 g/kg) seed completely eliminated seed infection by the pathogen.

Key words : Pigeonpea, Seed mycoflora, *Alternaria*, *Aspergillus*.

INTRODUCTION

Pigeonpea (*Cajanus cajan* (L.) Mills.) is being grown in tropical and subtropical parts of the world and has got high protein content of 21 per cent. The literature revealed that more than hundred pathogens were known to attack the crop (3). Among them *Cercospora* leaf spot, *Alternaria* leaf spot, Phyllody, sterility mosaic disease, *Fusarium* wilt and *Rhizoctonia* root rot are common. Incidentally only few of the seed borne pathogens known to cause economic loss. Among the pathogens except *Fusarium udum*, the seed borne nature of any of these pathogens is not yet recorded. The present paper reveals the fungi associated with the seeds of pigeonpea genotypes.

MATERIALS AND METHODS

Assessment of seed mycoflora:

Seeds of thirty-five genotypes were collected from RRS, GKVK, Bangalore, during *Kharif* 2001 and analysed for seed mycoflora by employing standard blotter technique as per the International Seed Testing Rules (2). Four hundred seeds of each sample was plated on three layers of moist blotters placed in sterile Petriplate of 90 mm diameter at the rate of 10 seeds per plate and the plates were incubated for seven days at temperature of 28 ± 1°C. After incubation, seed mycoflora were recorded on eighth day by observing fungal growth on seeds with the help of a stereo binocular microscope. Further the species were confirmed by conidial structure and their frequency of occurrence was expressed in percentage. Mean time the percent germination and percent decayed /abnormal seeds were also recorded.

Management of seed borne inoculum on pigeon pea seeds:

To control the seed infection of pigeon pea highly infected seed sample of the cultivar Pusa 2001-2 were selected and the seeds were subjected to different methods of treatment *viz.*, physical and chemical methods. A control was maintained for comparison without subjecting the seeds to any treatment. Four hundred seeds were used in each treatment. Seeds were incubated at a temperature of 28 °C with relative humidity of 70 per cent on moist blotters as per the standard blotter method with 4 replications under each treatment and examined for the effect of seed treatment on seed germination and per cent infection by the mycoflora was recorded on 8th day under stereo binocular microscope in all treatments. Physical seed treatment methods: *viz.*, hot water treatment and solar heat treatment were employed to control the seed infection.

Hot water treatment:

Pigeon pea seeds were subjected to hot water treatment at 30,

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35, 40 and 45°C with time interval of 10, 20 and 30 minutes at each temperature level. Seeds were shade dried and incubated for seven days on moist blotters by employing standard blotter method. Observations were recorded on 8th day.

Solar heat treatment:

The Pigeon pea seeds were subjected to solar heat treatment for two hours by keeping them on different substrates *viz.*, white paper, black paper, sand, concrete and asbestos. The seeds were incubated for seven days by employing the standard blotter method and the seeds were examined for the development of the fungus. The observations were recorded on 8th day and expressed in percentage.

Chemical seed treatment:

Pigeon pea seeds were treated with five fungicides *viz.*, emisan, chlorothalonil, mancozeb, thiophanate methyl and captafol at the rate 2 g/kg seed. Four hundred Pigeonpea seeds in each treatment were plated on standard blotters and incubated for 7 days. On eighth day observations were recorded and expressed in percentage.

RESULTS AND DISCUSSION

Six fungi *Viz.*, *Alternaria* spp. *Aspergillus flavus*, *A. niger*, *Helminthosporium* spp. *Cladosporium* spp. and *Fusarium* spp. were found associated with pigeonpea seeds.

The maximum infection of *Alternaria* spp. (75.00%) was recorded in PUSA-2001-1 and minimum was found in TT-102 (0.00%). Maximum infection of *Aspergillus niger* was observed in S-1 (72.00%) followed by H-88-22 (50.00%) and TT-102 was free from the infection. Maximum of infection of *Helminthosporium* spp., (60.00%) was found in the seeds of PUSA-2001-1, whereas PA-237, H-88-20 and H-88-25 were free from infection.

In certain genotypes *Fusarium* spp. association was recorded with maximum infection of 40.00 per cent in H-88-22 and least infection of 2.00 per cent was recorded in PUSA-991. Some genotypes were free from *Fusarium* spp infection *Aspergillus niger* was found up to 16.00 per cent in AL-2001, while PUSA-2003, PA-266 etc., were free from *A. niger*. Maximum recovery of *Cladosporium* spp. (76.00%) was observed in TT-101, where as AL- 2001, PA-266, H-88-22, H-88-25 etc., were free from infection. *Aspergillus niger* was also found frequently and there was significant reduction in germination (1-10%) Where ever *Aspergillus niger* was dominant the seeds were unable to germinate due to mycelial coverage and rotting.

Management of *Alternaria alternata* on Pigeon pea seeds

Hot water treatment:

When seeds were treated with hot water at a temperature of