BIOINFOLET 17 (1B) : 219 - 221, 2020

SEED MYCOFLORA ASSOCIATED WITH PIGEON PEA, ITS SIGNIFICANCE AND MANAGEMENT

S.V. Aithal, H.M. Lakde* and V.G. Sherikar*

Department of Botany, V.D.M.D.College, Degloor (M.S.)
*Departmentof Botany, Degloorcollege, Degloor (M.S.)

ABSTRACT

Mycoflora of Pigeon pea *(Cajanus cajan* L.) seeds were studied and its effect on seed germination and seedling growth was studied. Seed borne fungi caused considered reduction in seed germination and seedling growth. Effect of fungicides, bio-agents and Phyto-extracts on seed mycoflora, germination and vigour index of pigeon pea was also evaluated. Seed treatments improved seed germination, vigour index and reduced seed borne mycoflora.

Introduction

Major fungal diseases of Pigeon pea (*Cajanus cajan* L.) include wilt, Blight leaf spots and root rot. The fungal pathogens associated with seeds are responsible for several undesirable changes, making them unfit for human consumption as well as sowing (Patil *et.al.* 2012). Seed treatment with fungicides, bioagents and Phyto extracts can minimize seed mycoflora and the diseases caused by them. Plant extracts also show antifungal activity against wide range of fungi (Abd-Alla *et.al* 2001). Present investigation was undertaken to find out the fungi associated with the seeds of pigeon pea, and effect of fungicides, bio-agents and plant-extracts on seed mycoflora, seed germination, seedling length and vigor index.

Material and Methods

Seeds of pigeon pea (*Cajanus cajan*)- Cv. BSMR-736, Cv. BDN-703, Cv. ICPL-87119 were obtained from the pulses Research station, Marathwada Agricultural University, Badnapur, Jalna, Maharashtra, local farmers, local dealer, etc. The seeds were stored at 22°C in cloth bags and used whenever needed.

Standard blotter paper and Agar plate methods, described by ISTA (1996) were used for isolation of the seed-borne fungi associated with the pigeon pea seed samples.

Seven fungicides *viz;*mancozeb 63% + carbendazim 12% WP, carbendazim 50% WP, metalaxyl 8% + mancozeb 64%, pyraclostrobin 5% + metiram 55%, carbendazim 12% + mancozeb 63%, carboxin 75% WP and chlorothalonil 75% WP were evaluated to find out their effect on germination and vigour index of seeds, inoculated with isolated fungi. For this purpose treated seeds were evaluated by paper towel method (Khare, 1996) and incubated at 27 ± 2 °C for 7 days. After end of incubation number of germinated seeds, shoot length, root length, and percent germination were recorded.

Bio-priming of the seeds was carried out to study the effect of different bio-agents viz; *Trichoderma viride*@ 0.4%, *Trichoderma harzianum*@ 0.4%, *Pseudomonas fluorescens*@ 5.0 ml, Cumin seed extract @ 0.2%, Neem seed extract @ 1.0% and Garlic clove extract @ 1.0% on germination and seedling vigour. Fungi were identified as described by Watanabe (2002).

Results and Discussion

Eight fungi belonging to six genera

were isolated. Those were *Alternaria alternata, Fusarium oxysporum, Fusarium moniliforme, Drechslera sp., Curvularia lunata, Rhizoctonia sp., Aspergillus niger and Aspergillus flavus.*

Inoculation of pigeon pea seeds with fungi significantly reduced seed germination, shoot and root length, and thereby seedling vigour index (Table 1). Seeds inoculated with *Aspergillus niger* showed lowest seed germination (56%) which was at par with *Aspergillus flavus* (58%) as earlier reported by (Kandhare, 2014). All treatments resulted in reduced shoot length, root length and seedling vigor index. *Aspergillus* niger recorded minimum shoot length (4.00 cm), root length (5.25 cm) and seedling vigor index (518.20). Treatment with *Aspergillus flavus, Fusarium oxysporum, Fusarium moniliforme, Alternaria alternata, Drechslera sp., Curvularia lunata* and *Rhizoctonia sp.* recorded similarly.

Seeds treated with culture filtrates of *Aspergillus niger, A.flavus, Fusarium oxysporum, F.moniliforme, Alternaria alternata, Drechslera* sp., *Curvularia lunata* and *Rhizoctonia* sp. recorded 43, 45, 54, 58, 62, 66, 69, 73and 78per cent germination, respectively (Table, 2).

Aspergillus niger recorded minimum shoot length (3.30 cm), root length (4.70 cm) and seedling vigour index (344.20) which was at par with *Aspergillus flavus* 3.45 cm, 4.83 cm and 372.72, respectively). Similarly, *Fusarium oxysporum, Fusarium moniliforme, , Alternaria alternata, Drechslera* sp., *Curvularia lunata* and *Rhizoctonia* sp., also recorded less shoot length, root length and seedling vigor index. In comparison, significantly highest seed germination (96.00%), shoot length (8.15 cm), root length (12.80 cm) and seedling vigor index (2011.00) were obtained in healthy seeds.

Data presented in the Table 3 revealed significant effect of all fungicides on seed germination, shoot length, root length and seedling vigour index. Seed treated with metalaxyl 8% + mancozeb 64% recorde highest seed germination (93.33%) which wa at par with carbendazim 12% + mancozeb 63% (92.00%) and pyraclostrobin 5% + mitirarn 55% (90.67%). Whereas, mancozeb 75% WF carbendazim 50% WP, carboxin 75% WP an chlorothalonil 75% WP recorded 84.00, 74.67, 80.00 and 77.33 per cent seed germinatior respectively.

Significantly maximum shoot lengt (11.23 cm) was observed in seeds treated wit metalaxyl 8% + mancozeb 64% which was a t par with carbendazim 12% + mancozeb 63% (11.07 cm). Seeds treated with mancozeb 75% WP (9.20 cm),arbendazim 50% WP (8.30 cm pyraclostrobin 5%+ metiram 55% (9.93 cm carboxin 75% WP (8.13cm) and chlorothalor il 75% WP (7.73 cm) also increased shoot leng h over control. Significantly maximum root leng h (13.67 cm) was observed in metalaxyl 8% + mancozeb 64% which was at par wi h pyraclostrobin 5% + mitiram 55% (13.50 cm). Seeds treated with mancozeb 75% WP (11.67 cm),carbendazim 50% WP (10.57 cm), carbendazim 12%+ mancozeb 63% (12.67 cm), carboxin 75% WP (9.45cm) ar d chlorothalonil 75% WP (9.17 cm) al o increased root length over control.

Data presented in the Table 4 reveal d significant effect of all bio-agents and phy o-extracts on seed germination shoot length, r o length and seedling vigour index. Seed treat d with *Trichoderma viride* recorded highest se d germination (88.00%) which was at par w th *Trichoderma harzianum* (85.33%). Whereas in *Pseudomonas fluorescens*, Neem se d extract, Garlic clove extract and Cumin se d extract recorded 77.33, 73.33, 78.67, 74.67 and 72.00 per cent seed germinati n, respectively. The results in terms of shoot a nd root length with seedling vigour index, all he treatments showed larger shoot length, r ot length and seedling vigour index as compa ed to control.

Table 1.Effect of seed inoculation with different fungi on seed germination, shoot length, root length and seedling vigour index in pigeonpea

Fungi	Seed Germination	Shoot length (cm)	Root length (cm)	SV
Alternaria alternata	76.00	7.68	9.78	13[illegible].30
Fusarium oxysporum	54.00	4.73	6.83	56[illegible].70
Fusarium moniliforme	58.00	5.60	7.10	73[illegible].90
Drechslera sp	69.00	6.68	9.65	11[illegible]7.10
Curvularia lunata	73.00	23.96	23.82	1[illegible].10
Rhizoctonia sp.	78.00	7.03	10.33	13[illegible].50
Aspergillus niger	43.00	3.30	4.70	34[illegible]
Aspergillus flavus	45.00	3.45	4.83	37[illegible].2
Control (Healthy seed)	96.00	8.15	12.80	20[illegible].80

Table 3. Effect of seed treatment with fungicides on pigeon pea seed germination, shoot length, root length and seedling vigour index *in vitro*

Treatment	Conc.	Seed Germination	Shoot length (cm)	Root length (cm)	SV
Mancozeb 75% WP,	0.3%	84.00	9.20	11.87	[illegible]
Carbendazim 50% WP	0.1%	74.67	8.30	10.57	[illegible]
Metalaxyl 8% + Mancozeb 64%,	0.2%	93.33	11.23	13.67	[illegible]
Pyraclostrobin 5% + Metiram 55%,	0.2%	90.67	9.93	13.50	[illegible]
Carbendazim 12% + Mancozeb 63%,	0.2%	92.00	11.0[illegible]	12.57	[illegible]
Carboxin 75% WP	0.3%	80.00	8.43	9.45	[illegible]
Chlorothalonil 75% WP	0.3%	77.33	7.23	9.1[illegible]	[illegible]
Control	-	53.33	6.40	7.[illegible]	[illegible]
CD 0.05%		3.71	0.[illegible]	0.[illegible]	[illegible]

References

Abd-Alla, M.S., Atalla, K.M. and El-Sawi, M.A.M.(2001) *Annals Agric. Sci., Ain Shams Univ., Cairo*, 46: 579

ISTA (1996). International rules for seed testing. *Seed. Sci. and Techol.* 4:3

Dr. Anil Chidrawar
I/C Principal
A.V. Education Society's
Degloor College, Degloor Dist.Nanded