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SEED BORNE FUNGI OF RATI

R.B. SHARMA, A.K. SHARMA* AND DARSHNA SHARMA
Deptt. of Botany, Saraswati P.G. College, Hathras (U.P.)
***Research Scholar, Mewar University, Chittorgrah (Rajasthan).**

INTRODUCTION

Seed of Rati (Abrus Precatours) collected from localities around Hathras and Agra and maintained at 30, 60 and 90 per cent RH and ropm conditions wer tested by blotter paper and agar plant methods for the occurrence of seed borne fungi, only 4 fungi were found to pathogenic in soil test.

A number of fungal organisms are associated with the seeds (Shukla and Bhargava, 1976; Rath and Routray, 1987 and Sharma and Ray, 1991). Apart from causing disease, a large number of them reduce the germination of the seeds, cause seed rot and some times secrete compounds that are toxic to man and animals (Forgacs and Carle, 1962; Baker and Smith, 1967). This paper deals with the detection of seed-borne fungi in the stored samples (for 12 months) obtained from Hathras and Agra.

MATERIALS AND METHODS

The isolations were made by standard blotter and agar (PDA and Czapek's Dox Agra) plate methods (Anon, 1966). Four hundred seeds were taken from each sample. Surface disinfected seeds (with 0.1 per cent $Hgcl_2$ solution) were used to determine the seed-borne fungi. All the fungi were isolated in pure culture and identified.

The pathogenicity of different seed-borne fungi was tested in plates using blotter a in posts containing sterilized soil. In both the methods, surface disinfected healthy seed were rolled on the sporulating cultures before planting them or sterilized blotter paper or sowing them in post contamining sterilized soil, Equal number of surface disinfected sedds soaked in sterilized water before sowing served as control. The plates were incubated at room temperature (27 ± 20^0C) for 7 days. These were kept moist by adding sterilized water, when ever necessry. The observation regarding the per and post emergence rot of seeds and symptoms observed on seedlings are recorded from 10th day onwards.

During the soil test, the post were watered with sterilized water as and when found necessary. The observations regarding the germination of the seeds any symptoms observed on the seedlings were recorded for 30 days after sowing. Re-isolations were made to confirm the association of the test fungus.

RESULTS AND DISCUSSION

The observations (Table-1) indicate that Aspergilus flavus was the most servere pathogen as it destroyed 92 per cent of the seeds and seedlings. Aspergillus terrus, Fausarium roseum and Verticillum albo-atrum also exhibited their severe pathogenic nature by rotting the seeds and seedlings to the extent of 78-86 per cent. The other four isolates displayed for lesser pathgenicity that ranged between 23 and 30 per cent only. Interestingly, all the fungi exhibited greater adverse influence during pre-emergence one (seedling mortality). The rot developed on seed and seedlings are well evident in plates. The pathogenic nature of the isolates was further tested by soil inoculations (Table-1).

A comparision of seed and soil infestation tests indicates the parallel results were obtained in both the cases, though in the latter, all the fungi demonstrated greater severity. Here again, A. flavus was most severe as it brought about complete rotting, i.e., 75 per cent seed rot and 25 per cent seedling rot, thereby allowing no growth of normal seedlngs. In case of A. terrus, F. roseum and V. Albo-atrum only 10-40 per cent seedling managed to grow healthy. The rest four fungi displayed greater severity in soil inoculations as compared to seed infestation.

A few differential symptoms could also be noticed on the dying seedlings. In case of A. flavus, the seedlings died as soon as they emerged slightry above the soli level. The stem tended to attain the normal height. The leaves were lesser in number and much narrower as compared to the healthy ones. Soon they become blighted and withered. Finally, the apex also withered and seedlings died.

The seedlings infected by F. roseum generally grew to normal height but no leaf formation except cotyledonary leaves was noted. The stem and its apex including the embryonic leaf turned brownish and died. But in some cases, even after the death of apex, cotyledonary leaves servived for quite sometime. In comparison to the fungi, seedlings infected by V. albo-atrum showed more vegetative growth. Merely 2, 4 leaves developed but they remained smaller in size and soon developed brownish patches. Gradually the

Dr. R.B. Sharma (M.Sc., Ph.D.), Department of Botany, Saraswati P.G. College, Hathras-204101 (U.P.) Working from 1982 to till date. Specilization in Plant Pathology and Phycology. Ph.D. From Agra College Agra (Agra University, Agra in 1982). Research Papers Published 70, Accepted 08, Communicated 20 (National and International Journals), Paper presented in National & International Symposium 30, No. of Ph.D. (Dr. B.R.A. University, Agra : Awarded 10, Registered 05, No. of Ph.D. (Mewar University, Chittorgarh, Rajasthan Registered 04).

Table-1 : Pathogenicity test by blotter and soil inoculation.

Observations	Out of 100 sedd Blotter test		Soil test			
	Per-emergence	Post emergence	Healthy Rot	Seed Mortality	Seedling	Normal seedling
Aspergillus flavus	60	32	8	75	25	00
Aspergillus niger	20	8	72	26	18	56
Aspergillus terreus	58	28	14	56	34	10
Fusarium moniliforme	20	5	75	28	15	57
Fusarium roseum	52	20	28	45	20	35
Penicillium chrysogenum	13	10	77	50	24	26
Rhizopus oryzae	18	12	70	15	18	67
Verticillium-albo-atrum	40	38	22	41	40	14
Control	10	8	82	8	13	79

patches increased in perimeter and eventually embraced the entire leaf. Such blight symptoms were first developed on the youngest leaf.

Similar types of mortalities are reported in a number of leguminous crops (Kanjanasoon and Mathur, 1961; Garren 1966; Jakob 1969; Nath *et al.* 1970; Gupta and Saharan, 1973; Singh and Chauhan, 1973; Jaganathan *et al.,* 1976; Suhag, 1976). However, the lack of suitable environment may inhibit their pathogenesis (Thamson, 1970; Siraligam *et al.,* 2006, Narsimha Raw *et al.,* 2008, Kaur, A., 2009).

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