

Seed transmission of *Sarocladium oryzae* and *Fusarium moniliforme* in different genotypes of rice

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With the introduction of high yielding rice cultivars specially the hybrid rice, it is observed that the new introduced varieties or hybrids are showing more susceptibility for several diseases. Among these seed-borne pathogens occupy an important place as regard to seed quality and yield losses (Singh, 2000). The knowledge of transmission of pathogens through seed is essential to work out the role of seed borne inoculum in disease development and its management. In view of these facts, transmission of both the pathogen *i.e.* *S. oryzae* and *F. moniliforme* was studied in infected seeds.

For studying the seed transmission, blotter test and growing on test were conducted. The seeds have been collected from the crop showing varying degree of infection of various diseases on rice under field conditions. Seeds from, hybrid rice parents; CMS 58025 A, CMS 58025 B, were collected for proposed studies

along with the seeds of restorers; IR-66, KMR-3 and a established variety Pant Dhan-11 showing varying degree of severity of different diseases.

For blotter test a sum of 400 seeds of hybrid rice parents CMS 58025 A, CMS 58025 B, restorer IR-66, KMR-3 and a variety Pant Dhan-11 showing different degree of seed discoloration were taken for the purpose in 16 replications of 25 seeds each. Plastic Petri dishes of 8.5 cm diameter were taken and in each plate three layers of blotter paper soaked in sterilized water were placed. Twenty five seeds were arranged in 3 rows of 1:8:16 in each plate with the help of forceps. These Petri dishes were incubated at 20-30 C under alternate 12 hours light and dark periods for 7 days. For the growing on test three parts of fine sand and one part of clay soil were mixed thoroughly. The sand-soil mixture (3:1) was double sterilized in autoclave. The mixture was filled in

Table 1: Per cent seedling infection with *Sarocladium oryzae* and *Fusarium moniliforme* in different genotypes of paddy in blotter test and growing on test at different storage periods

Genotypes	January						February						March						April						May																											
	BT		GOT		S.O		BT		GOT		S.O		BT		GOT		S.O		BT		GOT		S.O		BT		GOT		S.O		BT		GOT		S.O																	
	S.O	F.M	S.C	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O	F.M	S.O																			
G ₁	9.50 (17.90)	12.00 (20.10)	0.00 (0.00)	0.00 (0.00)	7.40 (15.90)	10.25 (18.40)	0.00 (0.00)	0.00 (0.00)	4.25 (11.35)	8.00 (16.30)	0.00 (0.00)	0.00 (0.00)	2.50 (8.78)	6.00 (14.00)	0.00 (0.00)	0.00 (0.00)	2.50 (8.10)	8.00 (16.30)	0.00 (0.00)	0.00 (0.00)	4.25 (11.35)	8.00 (16.30)	0.00 (0.00)	0.00 (0.00)	2.50 (8.78)	6.00 (14.00)	0.00 (0.00)	0.00 (0.00)	2.50 (8.10)	8.00 (16.30)	0.00 (0.00)	0.00 (0.00)	4.25 (11.35)	8.00 (16.30)	0.00 (0.00)	0.00 (0.00)	2.50 (8.78)	6.00 (14.00)	0.00 (0.00)	0.00 (0.00)	4.25 (11.35)	8.00 (16.30)	0.00 (0.00)	0.00 (0.00)	2.50 (8.78)	6.00 (14.00)	0.00 (0.00)	0.00 (0.00)	4.25 (11.35)	8.00 (16.30)	0.00 (0.00)	0.00 (0.00)
G ₂	8.30 (16.10)	10.25 (18.30)	0.00 (0.00)	0.00 (0.00)	6.25 (14.10)	9.00 (17.30)	0.00 (0.00)	0.00 (0.00)	3.25 (10.10)	5.50 (14.45)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.50 (12.95)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.50 (12.95)	0.00 (0.00)	0.00 (0.00)	3.25 (10.10)	5.50 (14.45)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.50 (12.95)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.50 (12.95)	0.00 (0.00)	0.00 (0.00)	3.25 (10.10)	5.50 (14.45)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.50 (12.95)	0.00 (0.00)	0.00 (0.00)	3.25 (10.10)	5.50 (14.45)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.50 (12.95)	0.00 (0.00)	0.00 (0.00)				
G ₃	4.00 (11.20)	8.00 (16.20)	0.00 (0.00)	0.00 (0.00)	2.50 (8.75)	7.50 (15.90)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.25 (13.25)	0.00 (0.00)	0.00 (0.00)	1.00 (5.10)	3.50 (10.84)	0.00 (0.00)	0.00 (0.00)	1.00 (5.10)	3.50 (10.84)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.25 (13.25)	0.00 (0.00)	0.00 (0.00)	1.00 (5.10)	3.50 (10.84)	0.00 (0.00)	0.00 (0.00)	1.00 (5.10)	3.50 (10.84)	0.00 (0.00)	0.00 (0.00)	2.00 (8.10)	5.25 (13.25)	0.00 (0.00)	0.00 (0.00)	1.00 (5.10)	3.50 (10.84)	0.00 (0.00)	0.00 (0.00)	1.00 (5.10)	3.50 (10.84)	0.00 (0.00)	0.00 (0.00)								
G ₄	0.00 (0.00)	5.00 (12.70)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.50 (12.10)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	3.00 (9.50)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	3.00 (9.50)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	3.00 (9.50)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	3.00 (9.50)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	3.00 (9.50)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)											
G ₅	2.00 (8.00)	9.00 (17.10)	0.00 (0.00)	0.00 (0.00)	1.50 (6.50)	7.00 (15.22)	0.00 (0.00)	0.00 (0.00)	0.50 (3.85)	5.00 (12.70)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.40)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.40)	0.00 (0.00)	0.00 (0.00)	0.50 (3.85)	5.00 (12.70)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.40)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.40)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	4.00 (11.40)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)											
C.D. (P=0.05)	2.95	2.05			1.94	1.98			1.27	1.48			2.82	1.57				2.82	1.57			1.27	1.48			2.82	1.57					1.27	1.48			2.82	1.57			1.27	1.48											

Each value in the table is mean of three replications

Values in parenthesis are angular transformed value

BT = Blotter Test

G2 = CMS 58025 B

G3 = Restorer (IR-66)

G4 = Restorer (KMR-3)

G5 = Variety (Pant Dhan-11)

G1 = CMS 58025 A

thoroughly washed and sterilized six inch diameter plastic pots. A sample of 100 seed of each genotypes randomly selected were sown at the rate of 25 seeds per pot. Observations were recorded on emergence, seedling mortality and disease symptoms up to 40 days.

In blotter test *S. oryzae* could be isolated up to 4 months in seeds of genotype CMS 58025 A and CMS 58025 B. In genotypes IR-66 and variety Pant Dhan-11, these pathogens were recovered only up to 3 months in seeds. In restorer KMR-3 infection of *S. oryzae* was nil starting from January to May (Table 1). This finding is in accordance to Singh and Raju (1981), who reported that the pathogen survived for 4 months in seed. Maiti *et al.* (1991) observed that the pathogen survived for 10 and 7 months on infected rice seeds and inflorescences of *Echinocola colona*, respectively, under storage conditions. *F. moniliforme* survived in seeds up to the expiry of the experiment *i.e.*, May in CMS 58025 A and CMS 58025 B, restorer IR-66 and variety Pant Dhan-11. In KMR-3, *F. moniliforme* survived in seeds up to 3 months. Grewal and Kang (1998) revealed that *F. moniliforme* survived in stored rice seeds for 12 months, although incidence was much lower after 9 months. Sunder and Satyavir (1998) also reported the variation in the period of *F. moniliforme* in different rice cultivars, stored at room temperature under similar conditions.

All the genotypes, in growing on test did not reveal any infection on seedlings, raised from infected seeds at any of the storage period and the seedlings thus raised were healthy looking. It may be due to the low inoculum load on seeds which is not sufficient to create infection or may be due to unfavorable conditions for the pathogens to infect seedlings. However, Chuke (1983) reported the seed transmission of *S. oryzae* in naturally infected seeds of TN 1 and RGS 20. Milagrosa (1987) also showed seed transmission of *S. oryzae* in glasshouse experiment. Yu and Sun (1976) reported moderately diseased rice seeds with *F. moniliforme* may lead to 30 per cent disease symptoms.

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