

PREVALENCE OF FUNGI WITH SEEDS OF TWENTY BRRI RELEASED RICE VARIETIES AND SEED QUALITY ANALYSIS*

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Abstract

A total of 20 rice varieties of BRRI dhan 56 to BRRI dhan 75 were collected from Bangladesh Rice Research Institute (BRRI) for seed quality analysis, detection and identification of fungi associated with seeds of selected rice varieties. Dry inspection indicated that the percentage of pure seeds ranged from 90 - 100. The highest percentage of pure seed was found in BRRI dhan 66 and BRRI dhan 70 (100) and lowest in BRRI dhan 68 (90). A total of 21 fungal species were isolated from the selected rice varieties following “Blotter and Tissue Planting” methods. They were *Alternaria padwickii*, *A. tenuissima*, *Aspergillus flavus*, *A. fumigatus*, *A. niger*, *A. ochraceus*, *A. clavatus*, *A. terreus*, *Bipolaris sorokiniana*, *B. spicifera*, *Chaetomium globosum*, *Curvularia lunata*, *Drechslera oryzae*, *Fusarium* sp.1, *Fusarium* sp. 2, *Nigrospora* sp., *Penicillium* sp., *Pestalotiopsis guepinii*, *Rhizopus stolonifer*, *Syncephalastrum racemosum* and *Trichoderma viride*. Among them *Penicillium* sp., *Drechslera oryzae*, *Aspergillus ochraceus*, *A. flavus*, *A. fumigatus*, *A. niger* and *Fusarium* sp.1 were predominant in most of the rice varieties. In Tissue Planting method *Drechslera oryzae* showed the highest mean per cent frequency (6.69) and lowest was in the *Bipolaris sorokiniana* (0.41). Maximum total fungal association was recorded in variety BRRI dhan 61 (156.79%) and minimum in BRRI dhan 66 (24.69%). In Blotter method *Penicillium* sp. showed the highest mean per cent frequency (7.56) and lowest was in *Rhizopus stolonifer* (1.71). Maximum total fungal association was recorded in BRRI dhan 63 (147.37%) and minimum in BRRI dhan 65 (19.21%). Germination percentage of seeds was highest in BRRI dhan 66 (88) followed by BRRI dhan 67 (82), BRRI dhan 74 (80) and lowest in BRRI dhan 69 (24). The percentage of seedling mortality was highest in BRRI dhan 63 (42) and lowest in BRRI dhan 74 (8.0) followed by BRRI dhan 67 (10). Correlation coefficient and regression analysis indicated that prevalence of fungi has significant effect on seed germination and seedling mortality. The present research work suggests that out of 20 BRRI rice varieties, BRRI dhan 65, BRRI dhan 66, BRRI dhan 67 and BRRI dhan 74 showed better performances on the basis of percentage of pure seed, fungal association, seed germination and seedling mortality.

Key words: Prevalence, Fungi, BRRI rice, Seed quality, Germination percentage

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Introduction

Rice (*Oryza sativa* L.) is one of the most important food crops mostly grown in tropical and sub-tropical climates. It is the main staple food of Bangladeshi people which covers 92% of food grain production and 75% of the total cultivable land (Ahmed *et al.* 2013). Among the rice growing countries, Bangladesh rank fourth to China, India and Indonesia both in acreage and production (Anon. 2003). The average per hectare production of rice in Bangladesh is extremely low as compared to other rice growing countries of the world (BBS 2012). Rice provides 76% of calorie and 66% of total protein requirement of daily food intake (Bhuiyan *et al.* 2002). In Bangladesh, more than 78 hybrid rice varieties are grown (Bhandari *et al.* 2011).

Rice suffers from more than 60 different diseases. In Bangladesh, 43 diseases are known to occur on the rice crop. Among them 27 are seed borne of which 14 are of major importance. Rice seed plays an important role to carry pathogen in quarantine. Fungi are the principal organisms associated with seed in storage. Of the seed borne diseases of rice, 22 are caused by fungi (Fakir *et al.* 2002). The destructive seed-borne fungal diseases of rice are brown spot (*Drechslera oryzae* and *Bipolaris sorokiniana*), bakanae (*Fusarium moniliforme*), blast (*Pyricularia oryzae*), sheath blight (*Rizoctonia solani*), sheath rot (*Sarocladium oryzae*) and stem rot (*Sclerotium oryzae*) cause yield reduction, quality deterioration and germination failure (Haque *et al.* 2007). To avoid the infection of foreign pathogen and to develop better rice variety, Bangladesh Rice Research Institute (BRRI) has been trying since last few decades. As a result 75 rice varieties have been released from BRRI since 2015 but information about the seed quality status of these rice varieties is inadequate. The storage fungi grow vigorously and initiate grain spoilage. These also bring about several undesirable changes making them unfit for consumption and sowing. So far no pathological investigation has been done on 20 (BRRI dhan 56 BRRI dhan 75) released rice varieties. Therefore, the present investigation was undertaken to find out seed borne mycoflora of the 20 BRRI released rice varieties and their seed quality status.

Materials and Methods

Seeds of 20 BRRI released rice varieties (BRRI dhan 56 to BRRI dhan 75) were collected from Genetic Resources and Seed Division of Bangladesh Rice Research Institute during January 2015 to July, 2016, were kept in brown paper bag and stored immediately in a dry safe place in the laboratory until used for the experiments. One hundred gm seeds of each sample were visually inspected to analyze the seed quality. In a clean laboratory table, the seeds of each working sample were separated and the seeds were separated then graded into different categories (Table 1).

Per cent purity of seeds was determined according to the following formula (Khatun and Shamsi 2016):

$$\text{Per cent purity of seed} = \frac{\text{Weight of pure seed}}{\text{Total weight of seed}} \times 100$$

The fungi associated with rice seeds were isolated following “Tissue planting method” (Anon. 1968) and “Blotter method” (Anon. 1996).

Identification of the fungal isolates was determined based on morphological characteristics observed under a compound microscope following the standard literatures (Benoit and Mathur 1970, Booth 1971, Ellis 1971, 1976 and Barnett and Hunter 2000). Per cent frequency of the occurrence of the fungal isolates was calculated by adopting the formula of Spurr and Wetly (1972). Seedling mortality was determined after ten days of incubation by the formula of Anon. (2014).

Interrelationships among storage mycoflora, seed germination, purity and seedling mortality of different varieties of rice seeds were measured through correlation and regression analysis (Steel and Torrie 1960, Khatun and Shamsi 2016).

Results and Discussion

To analysis of seed quality, the percentage of normal and abnormal rice seeds is presented in Table 1. According to Seed Certification Agency (SCA) the accepted range of pure seed of rice is 96 to 99% in Bangladesh. Dry inspection indicated that the percentage of pure seeds ranged from 90 to 100. The highest percentage of pure seed was found in the varieties of BRRRI dhan 66 and BRRRI dhan 70 (100) and lowest was recorded in BRRRI dhan 68 (90). The highest percentage of spotted seed was recorded in the variety of BRRRI dhan 62 (2.50) and lowest in BRRRI dhan 68 (0.10). The highest percentage of discolored seeds was found in the variety of BRRRI dhan 64 (6.25) and lowest in BRRRI dhan 73 (0.20). The highest percentage of weed seeds was found in the variety of BRRRI dhan 72 (0.70) and lowest in BRRRI dhan 64 (0.05). The highest percentage of inert materials was found in the variety of BRRRI dhan 61 (1.30) and lowest in BRRRI dhan 69 (0.10).

Table 1. Per cent incidence of different types of rice seeds in dry seed inspection.

Name of varieties	Pure seed	Spotted seed	Discolored seed	Weed seeds	Inert materials
BRRi dhan 56	98.00	0.40	1.00	-	0.60
” ” 57	99.00	-	1.00	-	-
” ” 58	97.00	0.60	1.50	0.50	0.40
” ” 59	99.00	-	1.00	-	-
” ” 60	92.00	2.00	5.00	0.10	0.90
” ” 61	94.00	1.70	3.00	-	1.30
” ” 62	92.00	2.50	4.50	0.50	1.50
” ” 63	98.00	-	1.90	-	0.10
” ” 64	92.00	0.50	6.25	0.05	1.20
” ” 65	92.00	0.40	1.20	0.30	0.20
” ” 66	100	-	-	-	-
” ” 67	99.00	-	1.00	-	-
” ” 68	90.00	0.10	9.40	-	0.50
” ” 69	96.00	0.20	1.30	0.20	0.10
” ” 70	100	-	-	-	-
” ” 71	99.00	-	1.00	-	-
” ” 72	99.00	-	0.30	0.70	-
” ” 73	99.00	-	0.20	-	0.80
” ” 74	99.00	-	1.00	-	-
” ” 75	98.00	0.20	1.10	-	0.70

Naher *et al.* (2016) made dry seed inspection on BR11, BRRi dhan 30 and BRRi dhan 33 rice varieties. They reported that out of three varieties the highest percentage (83.35) of pure seed was in BRRi dhan 30. They also reported that the lowest percentage of spotted (2.75) and discolored seed (2.16) was in BRRi dhan 30 and BR11, respectively.

A total of 21 seed borne fungi were isolated from the selected BRRi rice varieties following tissue planting method (Table 2). The highest frequency percentage of *A. padwickii* and *P. guenpii* was noticed in BRRi dhan 60; *A. tenuissima*, *A. flavus*, *A. terreus* and *S. racemosum* on BRRi dhan 74, *A. fumigatus*, *B. spicifera*, *Fusarium* sp.1 on BRRi dhan 73, *A. niger* and *Fusarium* sp. 2 in BRRi dhan 65, *D. oryzae* and *Penicillium* sp. in BRRi dhan 61, *A. clavatus* on BRRi dhan 75, *C. globosum* in BRRi dhan 56, *C. lunata* and *Nigrospora* sp. in BRRi dhan 63, *R. stolonifer* in BRRi dhan 67 and *T. viride* in BRRi dhan 63. Among these fungi *D. oryzae*, *A. ochraceus*, *A. flavus*, *Penicillium* sp. and *A. fumigatus* were predominant in most of the rice varieties (Table 2).

More than ten species of fungi were found to be associated with BRRi dhan 57, BRRi dhan 61 and BRRi dhan 63 varieties (Table 2). Maximum total fungal association was recorded in BRRi dhan 61 (156.79%), BRRi dhan63 (136.5%), BRRi dhan 60 (130.5) BRRi dhan 57 (108.52%) and BRRi dhan 74 (104.49%) whereas minimum was

Table 2. Percent frequency of fungi with different varieties of BRRI rice seeds in tissue planting method.

Name of rice variety	Name of rice variety																				Mean
	BRRI 56	BRRI 57	BRRI 58	BRRI 59	BRRI 60	BRRI 61	BRRI 62	BRRI 63	BRRI 64	BRRI 65	BRRI 66	BRRI 67	BRRI 68	BRRI 69	BRRI 70	BRRI 71	BRRI 72	BRRI 73	BRRI 74	BRRI 75	
4. <i>Aspergillus fumigatus</i>	-	9.61	6.45	-	13.94	-	-	3.8	-	-	-	6.45	12.35	-	-	6.67	-	3.22	-	3.38	
4. <i>Aspergillus terreus</i>	10.71	-	-	14.28	-	-	5.12	-	18.42	-	19.04	-	-	-	-	-	-	7.14	-	20.5	
4. <i>Aspergillus niger</i>	13.43	12.9	1.97	-	-	13.9	5.22	1.4	2.98	4.47	1.49	-	3.22	8.95	2.98	2.98	-	23.07	6	3.64	
4. <i>Botrytis cinerea</i>	10.68	-	9.18	4.38	6.1	3.05	-	4.38	7.63	6.1	-	2.29	-	8.39	3.05	4.38	22.2	7.63	3.34	3.27	
4. <i>Claviceps purpurea</i>	-	11.02	3.76	7.6	6.1	10.35	3.84	-	16.62	7.6	-	3.84	-	-	3.76	10.5	7.6	4.83	-	4.83	
4. <i>Curvularia sp. 1</i>	2.72	3.18	-	14.98	10.92	28.3	10.2	8.18	4.08	-	3.7	-	2.72	3.22	-	2.76	6.73	8.9	-	6.9	
4. <i>Curvularia sp. 2</i>	-	7.4	-	-	-	11.95	3.7	11.11	-	-	-	-	-	-	7.4	14.81	-	21.42	-	4.08	
4. <i>Curvularia sp. 3</i>	-	-	-	-	3.30	2.10	-	-	-	-	-	-	-	-	-	-	3.00	-	-	0.42	
4. <i>Curvularia sp. 4</i>	-	-	-	-	12.08	13.37	-	-	-	-	-	-	-	-	-	-	20.02	-	-	2.38	
4. <i>Curvularia sp. 5</i>	18.66	12.85	9.41	-	13.28	7.14	-	4.58	-	10.71	-	-	-	-	-	-	-	-	-	4.08	
4. <i>Curvularia sp. 6</i>	-	11.76	-	-	17.64	6.52	-	18.51	-	-	-	-	-	5.88	-	-	-	-	-	3.03	
4. <i>Curvularia sp. 7</i>	5.19	2.79	6.59	7.69	-	23.52	-	13.28	11.18	5.19	5.22	5.22	-	16.78	12.58	7.6	-	6.3	6.69		
4. <i>Curvularia sp. 8</i>	-	3.84	2.38	-	-	21.1	3.48	7.07	-	8.33	3.78	-	4.48	3.12	4.1	12.38	21.42	-	3.78	4.69	
4. <i>Curvularia sp. 9</i>	3.98	10.69	8.34	2.38	-	12.35	-	22.5	-	-	-	-	5.25	5.25	5.25	5.25	8.94	3.18	3.74	1.04	
4. <i>Curvularia sp. 10</i>	-	-	-	-	-	18.57	-	9.52	-	12.8	-	-	-	-	-	-	-	-	-	2.04	
4. <i>Curvularia sp. 11</i>	5.78	-	-	-	-	-	-	-	-	-	10.57	4.1	-	-	-	-	-	-	6.52	1.34	
4. <i>Curvularia sp. 12</i>	-	-	6.52	-	-	-	-	-	-	-	-	-	-	8.04	8.88	10.39	6.6	12.05	5.2	2.92	
4. <i>Curvularia sp. 13</i>	6.13	12.5	-	6.13	-	-	-	12.75	-	-	-	10.25	12.08	-	-	-	-	-	-	3.02	
4. <i>Curvularia sp. 14</i>	32.78	108.5	38.48	66.08	120.5	126.7	26.1	186.5	46.62	88.25	24.69	33.19	42.1	30.84	48.28	68.14	79.34	99.74	104.49	71.86	

Represents no growth of fungi.

in BRR1 dhan 69 (30.84%), BRR1 dhan 62 (26.13%) and BRR1 dhan 66 (24.69%). In tissue planting method, Ora *et al.* (2011) found ten seed borne pathogens viz., *Alternaria tenuissima*, *Aspergillus flavus*, *A. niger*, *Bipolaris oryzae*, *Curvularia lunata*, *Fusarium moniliforme*, *Penicillium* sp., *Nigrospora oryzae*, *Rhizopus stolonifer* and *Xanthomonas* spp. associated with rice seeds. The highest incidence of *Xanthomonas* spp. was noticed on Tinpata whereas *Bipolaris oryzae* on Aloron, *Fusarium moniliforme* on ACI-1, *Rhizopus stolonifer* on Tia, *Alternaria tenuissima* on Hira-1, *Curvularia lunata* on Aloron, *Penicillium* sp. and *Aspergillus flavus* on BRR1 hybrid dhan-1, *Aspergillus niger* on Taj-1 were observed. *Nigrospora* sp. was recorded only on Hira-1. Of all the pathogens *Xanthomonas* spp., *Bipolaris oryzae*, *Aspergillus* sp., *Fusarium moniliforme* and *Rhizopus stolonifer* were predominant.

In blotter method a total of 17 seed borne fungi were isolated from the selected BRR1 rice varieties (Table 3). The highest frequency percentage of *A. padwickii* and *T. viride* was noticed in BRR1 dhan 67; *Aspergillus niger* in BRR1 dhan 56, *A. flavus* on BRR1 dhan 68, *A. fumigatus* in BRR1 dhan 64, *A. terreus*, *A. ochraceus* and *C. globosum* in BRR1 dhan 61, *B. sorokiniana* and *P. guepenii* in BRR1 dhan 71, *C. lunata* and *Fusarium* sp. 2 in BRR1 dhan 63, *D. oryzae* and *R. stolonifer* in BRR1 dhan 72, *Fusarium* sp.1 and *S. racemosum* in BRR1 dhan 74 and *Penicillium* sp. in BRR1 dhan 60 varieties (Table 3). *Penicillium* sp. showed the highest mean frequency percentage (7.56) of infection in 20 rice varieties which was followed by *A. fumigatus* (6.79), *A. flavus* (5.86), *D. oryzae* (5.24), *A. ochraceus* (4.99). Maximum total fungal association was recorded in BRR1 dhan 63 (147.3%) whereas minimum was in BRR1 dhan 65 (19.21%) variety.

Rahman *et al.* (2000) identified *Bipolaris oryzae*, *Trichoconis padwickii*, *Curvularia lunata*, *Nigrospora oryzae*, *Alternaria tenuis*, *Aspergillus* spp. and *Penicillium* spp. in BR 11 variety. Gopalakrishnan *et al.* (2010) conducted an experiment in India to identify the seed borne pathogen associated with rice seed and they recorded eight genera of fungi viz., *Alternaria*, *Aspergillus*, *Bipolaris*, *Chaetomium*, *Curvularia*, *Fusarium*, *Sarocladium* and *Trichoderma* comprising 12 species. Among them, the most predominant one was *Bipolaris oryzae* which was associated with 58.89% seed samples followed by *Alternaria padwickii* (52.96). In blotter method, Naher *et al.* (2016) detected six fungal species viz., *Alternaria padwickii*, *Aspergillus* spp., *Bipolaris oryzae*, *Curvularia lunata*, *Fusarium moniliforme* and *Fusarium oxysporum* from the 3 rice varieties such as BR11, BRR1 dhan 30 and BRR1 dhan 33. In blotter method, Ora *et al.* (2011) found 12 seed borne pathogens viz., *Alternaria tenuissima*, *Aspergillus* spp, *Bipolaris oryzae*, *Chaetomium globosum*, *Curvularia lunata*, *Fusarium moniliforme*, *Penicillium* sp., *Phoma* sp., *Nigrospora oryzae*, *Rhizopus stolonifer*, *Tilletia barylana* and *Xanthomonas oryzae*. Of all the pathogens *Xanthomonas* spp, *Rhizopus stolonifer*, *Aspergillus* spp. *Bipolaris oryzae* and *Fusarium moniliforme* were predominant.

Table 3. Percent frequency of fungi with different varieties of BRR1 rice seeds in bioher method.

Name of fungi	Name of BRR1 rice varieties																			
	BB1	BB2	BB3	BB4	BB5	BB6	BB7	BB8	BB9	BB10	BB11	BB12	BB13	BB14	BB15	BB16	BB17	BB18	BB19	BB20
<i>Aspergillus fumigatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>A. niger</i>	30.78	14.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>A. ochraceus</i>	5.71	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Bipolaris sorokiniana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Clavosporium erobotanum</i>	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Curculionella luteola</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Dicellaetia erucas</i>	10.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Eleutherus sp. 1</i>	8.82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Eleutherus sp. 2</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Penicillium sp.</i>	8.27	5.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Phoma solanaceae</i>	12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Sporium solanaceae</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Sporophobus truxis</i>	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Machospora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Zygodermium strids</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total % frequency	73.28	86.45	40.6	37.7	79.1	114.5	38.77	147.8	76.73	192.1	40.22	99.69	30.4	51.95	33.24	113.0	76.3	90.98	94.04	52.23

Represents no growth of fungi.

The fungal association with rice seeds also effects germination, seedling mortality as well as seedling height (Table 4). Among twenty varieties, in BRRRI dhan 74, the germination percentage was highest (98%) and in BRRRI dhan 62 this was lowest (25%). The highest mortality percentage value of rice seedling was found in BRRRI dhan 62 (16%) and the lowest value was found in BRRRI dhan 74 (2.04%). The length of root was highest in BRRRI dhan 72 (5.37cm) and lowest in BRRRI dhan 62 (2.20cm), whereas shoot length was highest in BRRRI dhan 73 (8.97 cm) and lowest in BRRRI dhan 67 (4.56 cm).

Table 4. Per cent germination, seedling mortality and seedling height of rice seeds after ten days of incubation.

Name of varieties	Germination (%)	Mortality (%)	Seedling height (cm)	
			Root	Shoot
BRRRI dhan 56	82	7.30	4.26	5.50
” ” 57	60	13.34	4.33	5.37
” ” 58	78	5.12	4.00	5.40
” ” 59	72	4.16	4.92	7.58
” ” 60	64	9.37	3.25	7.30
” ” 61	46	15.22	3.33	6.66
” ” 62	25	16.00	2.20	7.82
” ” 63	35	8.58	3.30	6.62
” ” 64	72	10.77	2.33	6.60
” ” 65	65	6.06	3.39	5.55
” ” 66	94	3.19	5.00	5.90
” ” 67	80	6.25	2.49	4.56
” ” 68	74	5.40	2.21	5.00
” ” 69	46	10.86	3.27	5.69
” ” 70	96	5.20	4.39	7.22
” ” 71	78	3.84	5.22	8.83
” ” 72	88	4.54	5.37	8.29
” ” 73	78	6.41	5.19	8.97
” ” 74	98	2.04	4.82	8.31
” ” 75	76	7.90	4.48	8.00

In case of Tissue Planting method Fig. 1A shows the relationship between percentage of germination rate and occurrence of fungi and negative correlation between the two variables. Here regression line gives a downward sloping curve which means that germination of seeds decreases when the percentage of fungi increases or the germination of seed increases when the percentage of fungi decreases. In the present study, the correlation co-efficient value between percentage of fungi and percentage of germination was +0.216. Fig. 1B shows the relationship between occurrence of fungi and seedling mortality and positive correlation between the two variables. Here regression line gives an upward sloping curve which means that both the variable change in the same direction i.e. the mortality of seeds increases when the percentage of fungi increases. The correlation coefficient value between percentage of fungi and seedling mortality was +0.212.

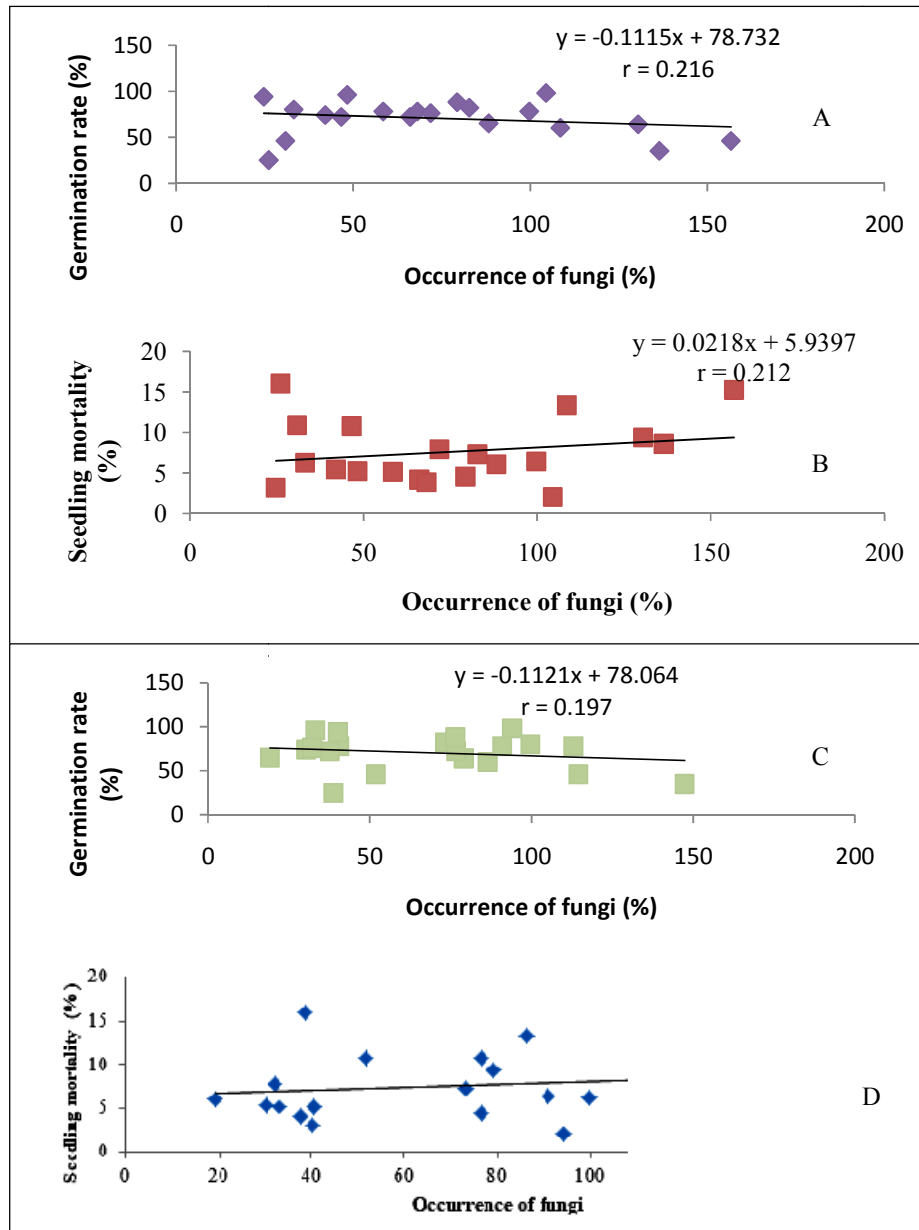


Fig. 1. For tissue planting method (A - B) correlation coefficient and regression equation between A = Germination rate (%) and occurrence of fungi (%), B = Seedling mortality (%) and occurrence of fungi (%); For blotter method (C - D) correlation coefficient and regression equation between C = Germination rate (%) and occurrence of fungi (%), D = Seedling mortality (%) and occurrence of fungi (%).

Similarly, for blotter method Fig. 1C shows the relationship between percentage of germination rate and occurrence of fungi and negative correlation between the two variables. Here regression line gives a downward sloping curve which means that germination of seeds decreases when the percentage of fungi increase or the germination of seeds increases when the percentage of fungi decrease. In the present study, the correlation co-efficient value between percentage of fungi and percentage of germination was +0.197. Fig. 1D shows the relationship between occurrence of fungi and seedling mortality and positive correlation between the two variables. Here regression line gives an upward sloping curve which means that both the variable change in the same direction i.e. the mortality of seeds increases when the percentage of fungi increases. The correlation coefficient value between percentage of fungi and seedling mortality was +0.153.

In the present work a total of 21 fungal species were isolated from the seeds of selected twenty BRRI released rice varieties. Among these fungi *Penicillium* sp., *Drechslera oryzae*, *Aspergillus ochraceus*, *A. flavus*, *A. fumigatus*, *A. niger* and *Fusarium* sp.1 were predominant in most of the rice varieties. The present work also showed that occurrence of fungi had significant effect on the seed germination and seedling mortality. On the basis of percentage of purity, fungal association, seed germination and seedling mortality BRRI dhan 65, BRRI dhan 66, BRRI dhan 67 and BRRI dhan 74 showed better results out of 20 BRRI released rice varieties.

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