

## A COMPARATIVE STUDY ON THE OCCURRENCE OF SEED-BORNE MYCOFLORA OF RICE IN PUNJAB AND SINDH

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(Received June 24, 1989; revised January 31, 1990)

Forty seed samples of rice collected from different places of Punjab and Sindh were analysed for the fungal flora in the laboratory. A total of 47 species of fungi were isolated using standard blotter method. Forty-five species of fungi were found to be associated with the samples collected from Sindh, while 36 with those collected from Punjab. *Aspergillus flavus* (7.5-8%), *A. niger* (7-8.5%), *Chaetomium globosum* (13.5-15%), *Curvularia lunata* (15-16%), *Drechslera hawaiiensis* (17.5-18%), *D. oryzae* (13.5-15.5%), *D. rostrata* (20.5-22%), and *Trichoconis padwickii* (27.5-30%) were recorded in higher frequencies in both Punjab and Sindh.

**Key words:** Rice, Seed-borne fungi, Sindh, Punjab.

### Introduction

Rice ranks second amongst food crops in Pakistan [2]. It is cultivated in an area of about 1.9 million hectares, with an average yield of 1571 kg/ha [8]. In Pakistan, work on seed borne diseases of rice was carried out by Kamal *et. al.* [9] Nayeemullah *et. al.* [11] and Khan *et. al.* [10]. The present work was carried out to compare the percentage occurrence of seed-borne fungi on rice in Punjab and Sindh.

### Materials and Methods

Forty seed samples of rice were collected from different places of Punjab and Sindh during the crop season of 1987-88. The main source from which seeds obtained were farmer fields, government godown and seed processing stations. Fungi were detected using standard blotter method [1]. 400 seeds of each sample were sown over the moistende blotters placed in petridishes, 25 seeds per dish. The dishes were incubated at 25±1° under 12 hr. alternating cycles of ADL (Artificial day light supplied by cool white flourescent tube) and darkness. After seven days of incubation, the seeds were examined for fungal growth. The fungi growing on them were identified [4-6].

### Results and Discussion

The fungi associated with seeds, their incidence percentage and percentage of samples were found infested are given in Table 1. A total of 47 species of fungi were isolated by the standard blotter method. Forty-five fungal species were isolated from samples of Sindh while 36 from those of Punjab.

The fungal species isolated in higher frequencies both from Punjab and Sindh in accordance to the percentage prevalence were *Trichoconis padwickii* (27.5-30%) *Drechslera rostrata* (20.5-22%) *D. hawaiiensis* (17.5-18%) *Curvularia lunata* (15-16%) *Drechslera oryzae* (13.5-15.5%), *Chaetomium globosum* (13.5-15%), *Aspergillus niger* (7-8.5%) and *A. flavus* (7.5-8%). *Drechslera oryzae* and

TABLE 1. PERCENTAGE INCIDENCE OF FUNGI FROM SEED SAMPLES OF RICE COLLECTED FROM SINDH AND PUNJAB.

Fungi	Percentage of Samples infested		Percentage of incidence	
	Sindh	Punjab	Sindh	Punjab
<i>Alternaria alternata</i> (Fr.) Keissler	80	60	5.5	5.0
<i>A. longipes</i> (Ellis & Everh.) Mason	10	—	1.0	—
<i>A. raphani</i> Groves & Skorko	5	—	0.5	—
<i>A. tenuissima</i> (Kunze ex pers) wiltshire	25	5	4.0	0.5
<i>Aspergillus candidus</i> Lin K	30	—	1.5	—
<i>A. flavus</i> Link ex Fr.	75	90	7.5	8.0
<i>A. fumigatus</i> Fres., Beitr. Zur.	10	5	0.5	0.5
<i>A. niger</i> Van Tiegh.	95	85	8.5	7.0
<i>A. sulphureus</i> (Fres), Thom and Curch.	10	75	0.5	5.2
<i>Cephalophora irregularis</i> Thaxter	25	—	1.5	—
<i>Chaetomium globosum</i> Kunze & Fr.	85	70	13.5	15.0
<i>C. funicola</i> Cooke	35	45	2.0	2.5
<i>C. olivaceum</i> Cooke & Ellis	25	30	2.0	1.5
<i>Cladosporium cladosporioides</i> (Fresh) de Vries	20	15	2.5	2.0
<i>C. sphaerospermum</i> Penz.	10	—	1.5	—
<i>Curvularia clavata</i> Jain	60	70	7.0	2.5
<i>C. lunata</i> (Wakkar) Boedijn	85	65	16.0	15.0
<i>C. pallescens</i> Boedijn	35	50	1.5	4.5
<i>C. robusta</i> Kilpatrick & Luttrell	20	—	1.5	—
<i>C. tuberculata</i> Jain	40	35	4.0	0.5

Contd. Table 1.

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Fungi	Percentage of Samples infested		Percentage of incidence	
	Sindh	Punjab	Sindh	Punjab
<i>C. verruculosa</i> Tandon & Bilgrami ex M.B. Ellis	25	15	3.5	3.0
<i>Drechslera biseptata</i> (Sacc. & Roum.) Richardson & Fraser	5	—	0.5	—
<i>D. hawaiiensis</i> (Bugn.) Subramanin & Jain	95	80	18.0	17.5
<i>D. halodes</i> (Drechs.) Subramanin & Jain	20	—	4.0	0.5
<i>D. oryzae</i> (Breda de Haan) Subramanin & Jain	45	60	13.5	15.5
<i>D. rostrata</i> (Drechs.) Richardson & Frasier	40	35	22.0	20.5
<i>D. longirostrata</i> (Subram.) Subram.	15	10	2.0	0.5
<i>D. sorokiniana</i> (I tox Kuribay) Drechslera & Daster	—	45	—	2.0
<i>D. spicifera</i> Nelson	60	70	3.0	3.5
<i>Epicoccum purpurascens</i> Ehrenb. exSchlecht	30	—	1.0	—
<i>Fusarium equiseti</i> (Corda.) Sacc.	20	45	1.5	4.0
<i>F. moniliforme</i> Sheldon	75	85	2.5	5.5
<i>F. nivale</i> (Fr) Ces.	15	45	0.5	4.0
<i>F. oxysporum</i> Schlecht. emend. Snyd. & Hans.	40	—	4.0	—
<i>F. semitectum</i> Berk and Rav.	45	—	5.5	0.5
<i>F. solani</i> (Mart.) Appel & Wollenw. emend. Snyd. & Hans.	40	55	0.5	3.0
<i>Memmoniella echinata</i> (Riv.) Gallowany	40	20	1.5	—
<i>Myrothecium roridum</i> Tode ex Fr	50	65	3.0	3.5
<i>Nigrospora oryzae</i> (Berk & Br.) Pech.	20	55	1.0	5.0
<i>Penicillium</i> sp.	60	75	2.5	3.0
<i>P. purpuragenum</i> Stoll	25	45	1.5	2.0
<i>Pithomyces graminicola</i> R.Y. Roy & Rai	—	35	—	1.5
<i>Rhizopus</i> sp.	75	85	2.5	3.0
<i>Stachybotrys atra</i> Corda	70	40	1.5	1.0
<i>Torula herbarum</i> f. <i>quaternella</i> Sacc.	35	—	1.0	—
<i>Trichoconis padwickii</i> Gangully	75	85	27.5	30.0
<i>Trichothecium roseum</i> Linke & Fries	10	35	0.5	3.0

*Trichoconis padwickii* were also reported to be important seed-borne mycoflora of rice [9-11]. *T. padwickii* was reported upto 80 percent in individual seed samples and seed infection leads to loss of seedling, seed rot and seed discolouration [7]. *D. oryzae* produced abnormal seedling in laboratory testing of rice for germination (Guerrero *et. al.*, 1972). *D. oryzae* caused rice blight or brown leaf spot occurs in all the rice growing areas of Pakistan. It can attack on plant at all stages, causing rotting of seed, poor germination, withering and yellowing of leaves [8]. In sindh, the disease exist in traces whereas in Punjab, the incidence was 5-6% [3].

The fungi which were scored in higher percentages in Punjab as compared to Sindh were *Aspergillus sulphureus*, *Curvularia pallescens*, *Fusarium equiseti*, *F. moniliforme*, *F. nivale*, *F. solani*, *Nigrospora oryzae* and *Trichothecium roseum*. The six seed-borne fungi viz, *Alternaria tenuissima*, *Curvularia clavata*, *C. tuberculata*, *Drechslera halodes*, *D. longirostrata* and *Fusarium semitectum* were recorded most frequently from Sindh as compared to Punjab. *Alternaria longipes*, *A. raphani*, *Aspergillus candidus*, *Cephalophora irregularis*, *Cladosporium sphaerospermum*, *Curvularia robusta*, *Drechslera biseptata*, *Fusarium oxysporum*, *Epicoccum purpurascens*, *Memmoniella echinata* and *Torula herbarum* f. *quaternella* were isolated exclusively from the samples of Sindh. *Drechslera sorokiniana* and *pithomyces graminicola* were similarly isolated only from the seed samples of Punjab. *Alternaria alternata*, *Aspergillus fumigatus*, *Chaetomium funicola*, *C. olivaceum*, *Curvularia verruculosa*, *Drechslera spicifera*, *Myrothecium roridum*, *penicillium* sp., *P. purpuragenum*, *Rhizopus* sp. and *Stachybotrys atra* were isolated more or less in equal percentage both from Punjab and Sindh. The climatic condition in Sindh and Punjab greatly influence on the incidence of rice diseases. In Sindh, the climatic condition during rice crop season mostly remained dry and warm, whereas in Punjab, it remained warm and humid which greatly influence the development of disease and in general seed-borne fungi.

The fact that the presence of such a higher number of fungi in or on the seeds can cause poor germination and consequently reduced seed production, cannot be ignored.

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