RESEARCH ARTICLE

Dectection of seed-borne Mycoflora of Rice Cultivar Priyanka (*Oryza sativa* L.) seeds

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ABSTRACT

Fungi associated with seeds of Priyanka cultivars of rice was isolated by Agar plate, blotter paper methods and seed washates. A total of 40 rice seed samples were obtained from different region of Konkan. Totally eleven genera of fungi viz., *Pyricularia oryzae*, *Aspergillus flavus, Aspergillus niger, Fusarium oxysporum, Bipolaris oryzae, Alternraria alternata, Curvularia lunata*, *Cercospora janseana, Curvularia lunata*, *Ephelis oryzae, Rhizoctonia solani*, *Scrocladium oryzae, Sclerotium rolfsii.* Comprising 13 species were found to be associated with the rice seed sample. Among them the most dominant *Pyricularia oryzae*, *Aspergillus flavus* and *Aspergillus flavus* which are associated with higest percent incidence followed by *Fusarium oxysporum.* A least percent incidence were observed with *Scrocladium oryzae* and *Sclerotium rolfsii* and *Ephelis oryzae.*

Key words - Rice (*Oryza sativa* L.) Cv. Priyanka, Screening methods.

INTRODUCTION

India is one of the world's largest producers of white rice, accounting for 20% of all world rice production. Rice is India's pre-eminent crop, and is the staple food of the people of the eastern and southern parts of the country. Rice (*Oryzae sativa* L.) belongs to the family Poaceae and is cultivated throughout the tropical and subtropical region of the world (Ezuka and Kaku, 2000). Rice seed is affected by fungal pathogens. So far more than 13 different fungi have been detected on rice seeds (Neergard, 1977). Rice is infested by number of diseases causing fungi and some of them are perpetuated through seed thereby affecting seed germination causing poor quality grains and low yields. Many micro-organisms including fungi have been recorded as seed borne in paddy. 13 fungal isolates on Priyanka cultivars were reported from Panvel of which Pyricularia oryzae, Aspergillus flavis and Aspergillus niger were most common. The present investigation was carried out to establish whether seed-borne fungi are responsible for seed shriveled, seed broken and seedling abnormalities. The infected seeds may fail to germinate, transmit disease from seed to seedling and from seedling to growing plants (Fakir *et al*., 2002).

MATERIALS AND METHODS

Collection of seed samples (Cultivars)

The seed sample of Rice were collected from various region of Konkan, Local farmar, market places, Kharland Research Station Panvel and Agriculture Research Station Karjat and Palghar. During the course of studies, seed samples were separately collected and stored in plastic containers without any treatment of fungicide/insecticide at laboratory conditions.

Detection of Seed Mycoflora on Paddy

These samples assessed for the detection of seed borne fungi through Agar plate, blotter paper and Seed washates (ISTA, 1966). These seed lots surface sterilized with the 0.5 % HgCl2. In this method, pre sterilized petriplates were poured with 15 mL of autoclaved Potato Dextrose Agar (PDA). On cooling the medium, ten seeds per plate of the sample to be studied were equidistantly placed aseptically. A pair of sterile white blotter papers of 8.5 cm diameter were soaked in sterile distilled water and were placed in pre-sterilized petriplates of 90 mm diameter. The plates were incubated at $28^0 \pm 2^0$C under diurnal conditions. On seventh day of incubation, seeds were first examined under stereoscopic microscope for determining the various fungal growth. The plated plates incubated for 7 days at 25 °C. After incubation fungi developed on each seed were examined under different magnifications of a stereomicroscope and were identified by colony, color, speculation.

RESULTS AND DISCUSSION

Table 1 and Fig. 1 reveal that this cultivar yielded thirteen fungi such as *Aspergillus flavus, Aspergillus niger, Pyricularia oryzae, Pyricularia grisea, Alternaria alternata, Fusarium oxysporum, Sclerotium rolfsii, Bipolaris orizae, Cercospora janseana, Rhizoctonia solani, Ephelis oryzae, Sarocladium oryzae and Curvularia lunata.* In case of agar plate, *Aspergillus flavus* (48.6%) gave highest percent incidence followed by *Aspergillus niger* (46.6%), *Pyricularia oryzae* (44.6%) and *Fusarium oxysporum* (41.6%). *Bipolaris orizae* (38%), *Alternaria alternata* (34.3%), *Curvularia lunata* (31%), *Cercospora janseana* (29%), *Pyricularia grisea* (25.6%), *Rhizoctonia solani* (22.6%), were found to be intermediate within range of 22.6 – 38 %. *Sclerotium rolfsi*, *Ephelis oryzae* and *Sarocladium oryzae* were found to be least.

In case of standard blotter paper, the percent incidence of *Aspergillus flavus* (42.3%) gave highest percent incidence followed by *Aspergillus niger* (39%) and *Pyricularia oryzae* (36%). *Fusarium oxysporum, Bipolaris orizae, Alternaria alternata, Cercospora janseana, Curvularia lunata* and *Pyricularia grisea* were found to be intermediates within the range of 20-33.6% . *Sclerotium rolfsii, Rhizoctonia solani, Ephelis oryzae* and *Sarocladium oryzae* were found to be least. In case of seed washates, the percent incidence of *Aspergillus flavus* (40%) gave highest percent incidence followed by *Aspergillus niger* (34%) and *Pyricularia oryzae* (31%).

Table1: Fungi associated with seeds of Rice (*Oryza sativa* L.) Cv. Priyanka

Sr. No.	Name of Fungi	Percent (%) incidence of Mycoflora		
		Agar plate	Standard blotter paper	Seed washates
1	***Aspergillus flavus***	48.6	42.3	40.3
2	***Aspergillus niger***	46.6	39	34
3	***Pyricularia oryzae***	44.6	36	31
4	***Fusarium oxysporum***	41.6	33.6	28.6
5	***Bipolaris orizae***	38	31.6	26
6	***Alternaria alternate***	34.3	28.3	21.3
7	***Curvularia lunata***	31	24.6	19
8	***Cercospora janseana***	29	22.3	17.3
9	***Pyricularia grisea***	25.6	20	16
10	***Rhizoctonia solani***	22.6	18.3	14.6
11	***Sclerotium rolfsii.***	19.6	16	12.3
12	***Ephelis oryzae***	18	13.6	11.3
13	***Sarocladium oryzae***	16.6	11.3	10.3
	SE ±	7.01	6.3	5.9
	CD at 0.05 %	19.83	17.9	16.8

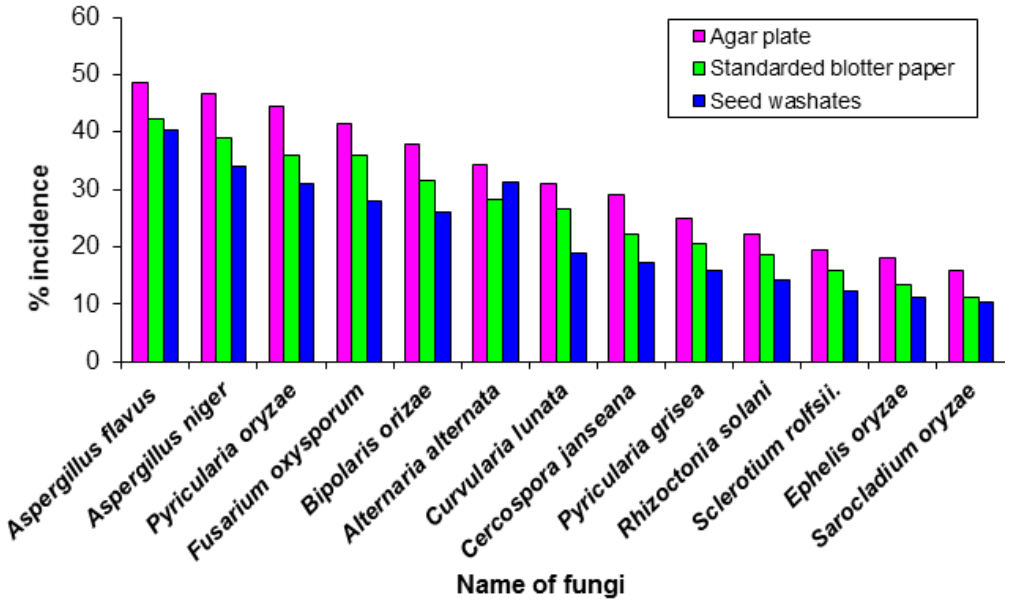

Fig.1. Fungi associated with seeds of Rice (Oryza sativa L.) Cv. Priyanka

Fusarium oxysporum, Bipolaris orizae, Alternaria alternata, Cercospora janseana, Curvularia lunata and *Pyricularia grisea* were found to be intermediates within the range of 16-28.6% . *Sclerotium rolfsii, Rhizoctonia solani, Ephelis oryzae* and *Sarocladium oryzae* were found to be least.

The present study was conducted to verify the presence of different mycoflora both in local and imported paddy seed lots. All fungal pathogens found in this study are known to be seed borne in nature. Rice crop is affected by a large variety of fungal pathogen and most of them are seed borne, which have been identified from rice seeds in *invitro* condition. Javaid (2002) studied seed mycoflora in rice. Mandhare (2008) studied Seed Health Evaluation in Paddy varieties (*Oryza sativa* L.). Gopalakrishnan et al. (2010) observed survey of Seed-Borne fungi associated with Rice. Butt et al. (2011) studied the seed Borne Mycoflora of Stored Rice Grains and its Chemical Control. Rathod et al. (2012) evaluated Seed borne Mycoflora from legume seeds. Ora et al.(2011) observed of Seed Borne Pathogens from Some Cultivated Hybrid Rice.

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