

Survey for prevalence of false smut of rice (*Ustilaginoidea virens*) from different districts of Punjab and Haryana**Shivam Singh****Department of Plant Pathology, School of Agriculture
Lovely Professional University, Phagwara-144411, Punjab***Corresponding author; email id: shivam.23596@lpu.co.in***ABSTRACT**

Survey for the prevalence of false smut of rice was carried out in October-November, 2019 from selected rice growing districts of Punjab and Haryana. Among all the districts surveyed, highest incidence (75%) of false smut of rice was recorded in Phagwara tehsil of Kapurthala district in Punjab and Rohtak tehsil of Rohtak district (55%) in Haryana. Incidence was ranged between 10 to 75% in surveyed districts of Punjab and Haryana.

Key words: *Disease incidence, false smut, rice*

INTRODUCTION

False smut disease of rice is also known as ‘Lakshmi disease’ and it is fungal disease caused by *Ustilaginoidea virens*. Previously, it was a minor disease but now a days it becomes one of the most important disease of rice. This disease was first reported from Tinneveli (Tamil Nadu) by Cooke in 1878 (Ou, 1972). Due to high nitrogenous fertilizer use, susceptible varieties and changes in climatic conditions, this disease has been noticed in severe condition. In India, false smut disease has been noticed in almost all rice growing states viz., Andhra Pradesh, Haryana, Maharashtra, Punjab, Uttar Pradesh, West Bengal etc. (Abbas *et al.*, 2002).

High relative humidity (>85%) and rainfall along with the temperature (25-30°C) favour development of this disease. High soil fertility and late sowing of the crop also favour disease development. Pathogen mainly attacks at flowering stage due to which flower fertility reduces and spikelets not develop properly and gain weight as well as yield reduces. (Mandhare *et al.*, 2008).

According to the previous study done very few research work on the false smut is being going on in India because of its minor importance. Main aim of this work was to record false smut disease infection and incidence from different rice growing areas in Punjab and Haryana and to check the reaction of different rice varieties used for cultivation of rice.

MATERIALS AND METHODS

A survey was carried out to record false smut disease (*Ustilaginoidea virens*) incidence by using roving method (Bala *et al.*, 2013). Total seven districts were surveyed during October- November, 2019, in which five (Jalandhar, Kapurthala, Gurdaspur, Hoshiarpur and Mansa) were from Punjab and two districts (Rohtak and Sirsa) were from Haryana. One to four tehsils were randomly selected for survey from each district. In every village, five to ten 1 m² areas were randomly spotted in rice fields and two observations (number of infected plants per m² and smut balls per tiller), were recorded (Shivalingaiah and Umesha, 2011; Ladhakshmi *et al.*, 2012 and Singh *et al.*, 2013). The samples collected from different locations of all seven districts were brought to the laboratory for their identification (Soosairaj *et al.*, 2012). All the related data are shown in Table 1.

RESULTS AND DISCUSSION

As a part of routine research work, a survey was carried out to check incidence of false smut disease in rice (*Ustilaginoidea virens*) in Punjab and Haryana, in October-November 2019, which revealed that false smut disease incidence was very widely spread in survey areas. Range of disease incidence was between 10% to 75%, which caused a considerable reduction in yield of grain. Numbers of infected balls per tiller were ranged between 03 and 17. Maximum incidence of false smut disease was recorded in Phagwara tehsil of Kapurthala district which was followed by Rohtak tehsil of Rohtak district (Table 1). Infected balls per tillers was recorded maximum in Kapurthala district in Punjab and Rohtak district in Haryana. From a distance, air above or near to the infected rice fields was giving black smoky appearance because of heavy production of fungal spores in environment. Among all surveyed districts, maximum disease incidence was recorded in Kapurthala district of Punjab and in Rohtak district of Haryana and some varieties of rice, viz., Pusa-44, PB-

1121, PB-1401, PB-1509, RH-10, PAU-121, PR-126, Parmal-47 and Parmal-14 were found most susceptible for false smut of rice in the particular areas.

Table 1: Incidence of false smut of rice (*Ustilaginoidea virens*) in selected regions of Punjab and Haryana

Districts	Blocks/ Tehsils	Surveyed villages	Varieties used	Disease Incidence (%)		No. of infected balls per tiller	
				Range	Mean	Range	Mean
PUNJAB							
Jalandhar	Jalandhar-I	Bhagwanpur, Chachowal, Chak Daulatpur, Kishanpur, Nangal Fateh Khan, Raipur and Salarpur	PR-3590, PB-1718 and PR-114	15-30	20.57	3-8	5.28
	Jalandhar-II	Athaula, Bagota and Dhogri	Pusa-44	18-24	20.67	4-7	5.34
	Phillaur	Daduwal, Goraya, Mandi and Miranpur	PB-1121 and PR-126	15-25	21.25	3-6	4.50
	Nakodar	Maheru, Mehatpur and Nakodar	PB-1509	20-35	26.67	3-6	4.67
Kapurthala	Kapurthala	Alipur, Daulatpur and Navanpind	Parmal-47, Parmal-121, PR-121 and PB-1121	15-25	30.00	5-7	6.00
	Phagwara	Atholi, Bhagwanpur, Chaheru, Dhak Darwesh, Gandhwan, Hadiabad, Hradaspur, Khajurla, Khangura, Kirpalpur, Madhopur, Man, Nangal Majha, Narangpur, Phagwara, Ranipur Rajputan, Rawal Pindi, Sapreore and Sri Hargobindgarh	Pusa-44, PB-1121, PB-1401, PB-1509, RH-10, PAU-121 and PR-126	10-75	42.37	3-17	11.11
Gurdaspur	Dera Baba Nanak	Dharamkot Randhawa, Mehta, Rampur, Shampura,Shezada, Singhpura and Thetharke	PR-121, Pusa-44 and PB-1509	14-27	19.71	3-8	6.28
Hoshiarpur	Hoshiarpur	Baupur and Bhathian Brahmanan,	PR-121	25-35	30.00	5-8	6.5

	Mukerian	Amirpur, Bhattian Rajputtan, Chakowal, Dhanoya, Muradpur and Tanda Ram Sahai	PR-121 and Pusa-44	15-50	30.84	6-8	7.00
	Dasua	Himmatpur, Kalyanpur and Terkiana	Pusa-44	25-45	35.00	7-9	7.67
Mansa	Mansa	Aklia, Bhaini Bagha, Burj Dhilwan, Burj Hari, Burj Jhabran, Burj Rathi, Joga, Ralla, Tamkot and Ubha	Pusa-44, and PB-1121,	15-35	25.50	4-8	6.00
HARYANA							
Rohtak	Rohtak	Anwal, Bahu Akberpur, Bhalot, Bohar, Chamaria, Dobh, Gaddi Kheri, Jindran, Lahli and Sanghi	PB-1121, PB-1509, PB-1401, Parmal-47 and Parmal-14	25-55	41.50	6-11	8.50
Sirsa	Sirsa	Alikan, Bupp, Kirar Kot, Nagoki, Neza dela Khurd, Panihari and Rampura	PB-1, PB-1121, PB-1509, PB-1401	22-45	34.86	6-9	7.14

According to studies done by many authors, previously false smut disease (*Ustilaginoidea virens*) of rice was considering as a minor disease but now a days it is becoming a major disease of rice because it spread very fast with the help of air from one field to another filed. On the basis of this surveyed data, we can say that this disease is emerging as a major disease of rice because it's incidence was recorded up to 75% from different parts of selected districts of Punjab and Haryana. All India Coordinated Rice Improvement Programme was conducted a survey (Production Oriented Survey) and found that this disease is increasing gradually year by year, due to which farmers are facing lots of problem regarding grain yield (POS 2000-2009).

In Raigarh district of Chhattisgarh, total rice cultivated area of 600 ha was severely infected by false smut disease (*Ustilaginoidea virens*) in 2007 and so much yield losses was recorded. Due to infection of *Ustilaginoidea virens*, black colour smut spores and chlamydospores were found in grains of rice, due to which farmers got very low market price. Due to bad field conditions, non-resistant varieties and pathogen virulence, infection took place in field and due to which yield losses was recorded (Singh and Pophaly, 2010).

Incidence of false smut disease was ranged between 2% and 85% in both the Northern and Southern parts of India (Ladhalakshmi *et al.*, 2012). Singh *et al.* (2014) also reported incidence of false smut disease, ranged from 5% to 80%, from different parts of Uttar Pradesh. Some other authors like Singh *et al.* (2012); Ladhalakshmi *et al.* (2012) and Wang *et al.* (2013) and, have done the same work and false smut disease was recorded in very wide range and incidence was depending upon the cultivators.

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