Extensive Survey of Sheath Blight of Rice (*Rhizoctonia solani*) in Different Geographical Area of Chhattisgarh.

Abstract

The present investigation was carried out in the department of Plant Pathology, College of Agriculture, I.G.K.V., Raipur (C.G) during the year 2022-23. Across the world, rice is cultivated as a significant cereal crop, but mostly in Southeast Asian countries. Six rice growing districts of Chhattisgarh were surveyed for sheath blight of rice disease viz. Dhamtari, Balod, Raipur, Kanker, Ambikapur and Kawardha. The disease incidence at the time of survey ranged from 25.82 % to 70 %. The highest percent disease incidence (70%) was recorded at village Mujgahan, districts Dhamtari and lowest PDI was 25.82% at Kawardha districts.

Keywords: *Rice, Sheath blight, Survey, Perecent disease incidence*

Introduction

Rice (Oryza sativa L) is the staple food crop of majority of the India population. Rice is an imperative cereal crop all over the world, but it is grown mostly in Southeast asian countries. The crop is grown in the Himalayas between 6 feet below sea level and 2700 feet above sea level (Pathak *et al*., 2020) .Over the next 20 years, it is estimated that demand for rice will increase by 2.5 percent annually (Hobbs, 2001).

Chhattisgarh, West Bengal, Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Punjab, Orissa, and Bihar are the top leading rice producer states in India. Over 75% of rice production in India is produced by these regions, which keeps around 72% of India's total rice producing region. West Bengal has the highest production. In 2020-21, production of rice in West Bengal was 16.65 million tonnes. Uttar Pradesh is second in this list of India's largest paddy rice producer in 2020-21. Uttar Pradesh's rice production was 15.66 million tonnes. Rice cultivationarea in India is 47.07 million hectares and rice production in India 122.27 million tonnes. Chhattisgarh also called as 'rice bowl of India'. Rice cultivation area in Chhattisgarh 3.79 million hectares and rice production in Chhattisgarh 7.16 million tonnes. (Anonymous,2021).

Rice sheath blight caused by *Rhizoctonia solani* [Teleomorph: *Thanatephorus cucumeris* (Frank) Donk] is one of the most important biotic constraints in India. Miyake first described *Rhizoctonia solani* in Japan in 1910 (Ou,1985). In India, Chahal (1963) first reported it from Gurdaspur in Punjab. Sheath blight of rice is second most economically important disease after blast. Inoculum from the sheath blight infected field also becomes major Source of primary inoculums.

Materials and Methods

An extensive survey of rice field was carried out to find out the incidence and severity of sheath blight caused by *R.solani* in Kharif- 2022-23 and transplanting to harvesting period of the crop in different rice growing districts of Chhattisgarh viz., Dhamtari, Balod, Raipur, kanker, Ambikapur and Kawardha In each district, two to five villages were selected. In each field, three random plots of $1m^2$ were selected and observed.

The Perecent disease incidence (PDI) was calculated by using following formula:

$$\text{Disease incidence PDI} = \frac{\text{Number of infected hills Perecent}}{\text{Total number of hills}} \times 100$$

Naturally infected leaves and others plants parts showing characteristics symptoms of sheath blight were collected from each surveyed rice field and brought to the laboratory for symptoms description and isolation.

For the isolation of *Rhizoctonia solani*, infected rice plant parts, cut with the help of sterilized blade having typical symptoms along with healthy tissues were. Pieces were

washed carefully with the tap water and placed into 1.0 % sodium hypochloride solution for 30 seconds followed by washing thrice with the sterilized water thoroughly. Excess water was removed by placing on the folds of sterilized blotting paper. Dried pieces were aseptically transferred into sterilized petridishes containing potato dextrose agar medium with the help of a sterilized forceps. Inoculated petridishes incubated at 25±20 C in B.O.D. incubator. After two days of isolation the fungus growth was checked in the Petridishes.

Results and Discussion

Extensive survey of six districts of Chhattisgarh were survey was conducted in the months of October, November, and December. There districts were Dhamtari, Balod, Raipur, kanker, Ambikapur and Kawardha and were PDI of sheath blight disease of rice recorded during Kharif 2022-23. The results obtained after survey were presented in Table 1 The disease incidence at the time of survey ranged from 25.82 % to 70 %. The highest percent disease incidence was recorded (70%) at village Mujgahan, districts Dhamtari followed by 65.49 % at village Perpar belongs to dist. Balod. In kanker district highest PDI was 40.17 % at kanker followed by 30.30% at matwada village. In Ambikapur district the PDI was recorded 54.13 % and in Raipur district the highest PDI was recorded 45.10 % at research farm IGKV followed by bhendri-2 34.64 %. The lowest PDI was 25.82% at kawardha districts.

Similar findings were reported by Rathor et al. (2017). They observed highest disease incidence (76%) at gariyaband followed by raipur (47.5%), and kawardha had the lowest (30%) disease incidence. Thera et al. (2013) reported similar findings.

Fig 1. Extensive survey of six districts of Chhattisgarh.

Table 1. Extensive survey of six districts of Chhattisgarh.

S.No	Location			Latituide/ Longitude	Crop stage	Sowing method	DI %
	District	Block / Tehsil	Village				
1	Dhamtari	Dhamtari	Mujgahan	20.724519˚ 81.527756˚	Tillering	Transplanting	70
		Magarlod	Hasda	20.833617˚ 81.869153˚	Tillering	Transplanting	43.55
		Nagri	Siyadehi	20.643548˚ 81.620936˚	Booting	Transplanting	40.39
2	Raipur	Raipur	IGKV	21.234894˚ 81.700203˚	Milky satage	Transplanting	45.10
		Abhanpur	Bendri-2	21.123967˚ 81.738461˚	Milky satage	Transplanting	34.64
3	Balod	Gurur	Khundani	20.746079˚ 81.443531˚	Tillering	Transplanting	40.43
		Gurur	Perpar	20.752556˚ 81.482764˚	Tillering	Transplanting	65.49
		Gurur	Basin	20.791869˚ 81.424964˚	Flowering	Transplanting	35.75
4	Kanker	Kanker	kanker	20.237906˚ 81.509482˚	Heading	Transplanting	40.17
		Kanker	Matwada	20.26236˚ 81.516677˚	Booting	Transplanting	30.30
5	Kawardha	Kawardha	Kawardha	22.143941˚ 81.33655˚	Panical initiation	Transplanting	25.82
6	Ambikapur	Ambikapur	Ambikapur	23.154176˚ 83.14269˚	Tillering	Transplanting	54.13

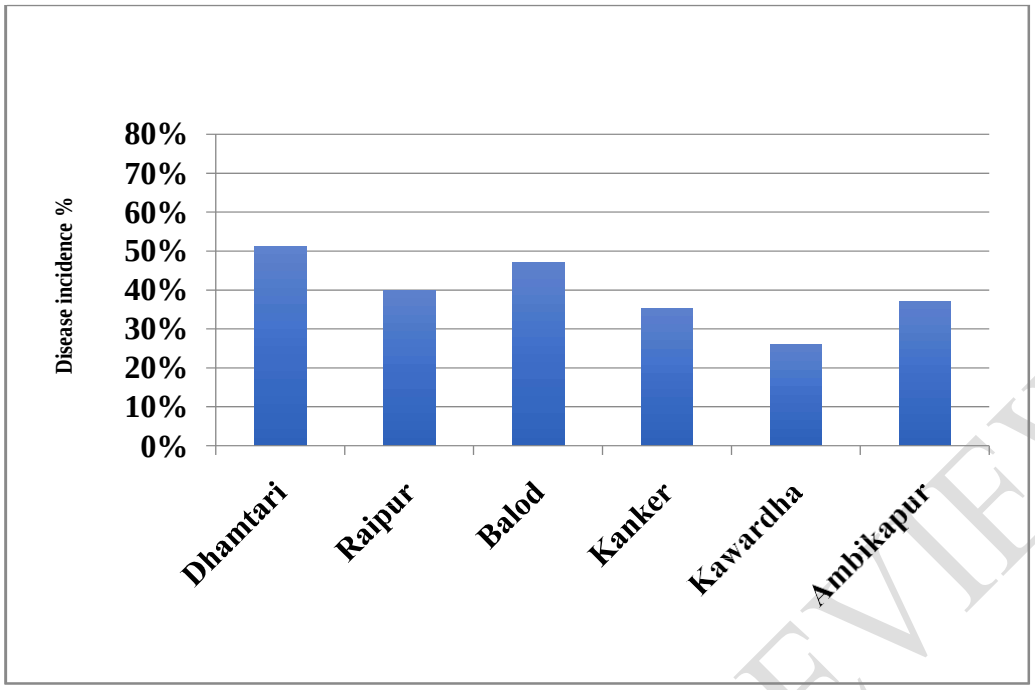

Fig 2.Graphical representation of PDI % district wise

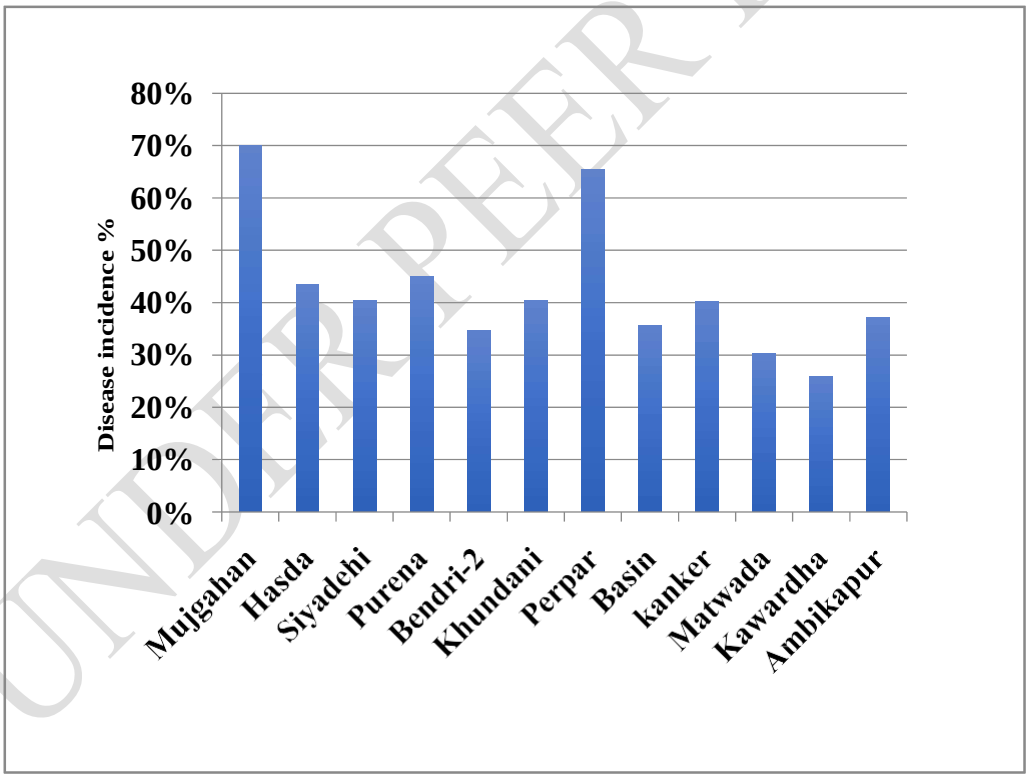

Fig 3. Graphical representation of PDI % village wise

References

Prasad, N., Singh, N., Avinash, P. and Tiwari, P.K., (2020). Efficacy of botanical plant product and extracts against *Rhizoctonia solani* Kuhn causing sheath blight disease of rice under in vitro Condition. Journal of Pharmacognosy and Phytochemistry, 9(3), pp.312-315.

Hobbs, P.R. (2001). Tillage and crop establishment in South Asian rice. 46: 12- 17.

Ou, S.H. 1985. Rice disease.2nd Edition Common wealth Mycological Institute, Kew, Surrey, England. pp 379

Chahal, K.K.S., Sokhi, S.S. and Rattan, G.S. (2003). Investigation on sheath blight of rice in Punjab. Ind. Phytopath., 56(1): 22-26.

Rathod P. Yadav1 S C , Awadhiya1 G. K. Awadhiya1, Prasad2 M.S and Prakasam2 V (2017) Survey and Occurrence of Sheath Blight of Rice in Major Rice Growing Areas of Chhattisgarh Int. J. Pure App. Biosci. 5 (4): 838-845