The Pharma Innovation Journal 2023; 12(9): 915-918

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(9): 915-918

www.thepharmajournal.com
Received: 24-06-2023
Accepted: 29-07-2023

Raghunandana
Ph.D. Scholar, Department of Plant Pathology, University of Agricultural Sciences, Dharwad, Karnataka, India

Prashanthi SK
Professor, Department of Plant Pathology, University of Agricultural Sciences, Dharwad, Karnataka, India

Arvind M
Assistant Professor, Department of Plant Pathology, RARI, Durgapura, Jaipur, Rajasthan, India

Corresponding Author:
Raghunandana
Ph.D. Scholar, Department of Plant Pathology, University of Agricultural Sciences, Dharwad, Karnataka, India

Incidence of sheath blight disease caused by *Rhizoctonia solani* Kuhn in major rice cultivating districts of Karnataka

Raghunandana, Prashanthi SK and Arvind M

Abstract
Sheath blight of rice caused by *Rhizoctonia solani* Kuhn has posed a significant threat to production-oriented farming in recent years. A random survey was carried out in different districts of Karnataka *viz*., Dharwad, Haveri, Mandya, Mysuru and Uttara Kannada during *kharif*-2022 to know the disease prevalence and incidence of sheath blight of rice. Highest incidence of the disease was observed in Jeemarali (47.61%) and Bokkhalli (47.36%) villages of Nanjangud taluk of Mysuru district. Among the districts, highest mean DI (37.47%) was observed in Mysuru, followed by Mandya (27.70%), Haveri (20.84%), Uttara Kannada (6.31%) and the least severity of 6.04 percent was observed in Dharwad.

Keywords: Sheath blight, rice, survey, severity

Introduction
Rice (*Oryza sativa* L.,) world's most extensively consumed cereal crop, is especially important to the rapidly growing populations in South Asian countries and provides 20 percent of the dietary protein in the developing countries where rice is the staple to the diet (Pareja *et al*., 2011) [4]. As the world population is anticipated to reach over 9 billion by 2050, it has been predicted that total food production will only be sufficient for 60 percent of the population (FAO, 2018) [1]. China produces largest amount of rice (142.30 million tonnes) followed by India
(118.87 million tonnes), with productivity of 2722 kg/ha *w.r.t*., Karnataka scenario, its production being, 2.90 million tons (FAO, 2018) [1]. Rice production is prone to many abiotic and biotic stresses. Several pathogens that harbour the rice ecosystem pose a great threat to its production, among which, *Rhizoctonia solani*, the causative agent of sheath blight (ShB), is responsible for yield loss up to 45 percent (Margani and Widadi, 2018) [2].
In Karnataka, rice is majorly grown in different riverine districts. Mono-culturing of high yielding susceptible cultivars over a longer period have led to severe outbreak of pests and diseases. Among them, ShB disease is major menace for the rice cultivation. In view of this, an investigation was carried out to know the incidence of ShB disease in different districts of Karnataka.

Materia and Methods
A roving survey was conducted in *kharif* -2022 to know the disease presence and assess the incidence of ShB disease in different rice growing districts of Karnataka. Survey was carried out in following districts *viz*., Dharwad, Haveri, Mandya, Mysuru and Uttara Kannada (Table 1).
Disease incidence (DI) was calculated by observing the number of tillers infected in the field by selecting 10 plants from 5 spots (1 m2 area) using the following formula:

$$DI = \frac{Number\ of\ infected\ tillers}{Total\ number\ of\ tillers} \times 100$$

Results and Discussion
During survey symptoms of sheath blight were seen as circular spots of 1 cm length that occur on leaf sheath near the water level. Lesions also appeared on entire sheath and several lesions coalesced. In severe cases, most of the leaves were blighted. Sclerotial bodies of varying

shapes and sizes were formed on the infected plant portions and were easily detachable. Heavy infected plants produced poorly filled grains and may die with immature panicle. Lodging of plants occurred in diseased plants, particularly in taller varieties.

During the survey crop was at tillering to mature stage. The disease incidence (DI) was measured using the formula and expressed in percentage. It was found that, among the districts, the DI was in the range of 6.04 to 37.47 percent during *kharif*-2022.

In Dharwad, major paddy cultivars such as, Intan, Ankur saali and Dodda saali were cultivated around the district. Among all the villages surveyed around Dharwad, highest DI of 9.52 percent was observed in Hire honalli followed by Jodalli (6.66%) and least DI was recorded in Mandihal (3.22%). In Haveri, average disease incidence of the district was 20.84 percent. Makanur village of Ranebennur recorded highest DI of 42.85 percent and least DI of 11.11 percent was noticed in Mylara village. The average DI of ShB in Mandya district was 27.70 percent. Whereas, Madduru, Mandya and Srirangapattana taluks recorded DI of 28.71 percent, 21.05 percent and 29.24 percent. The DI in the surveyed villages was in the range of 21.05 to 31.57 percent. Highest DI of 31.57 percent was noticed in Kodiyala followed by Mabbalgere (30.76%) villages and lowest DI of 21.05 percent was recorded in Bevinahalli village. In Mysuru district extensive survey has been carried out in 19 villages of Mysuru, Nanjangud and T. Narasipura taluks. In the farmers' fields paddy varieties like, BPT 5204, MNS-99, Jyothi, MTU-1010, Kaveri sona and Ajay were cultivated in large scale. The average DI of the district was 37.47 percent. The disease severity in the surveyed villages was in the range of 21.42 to 47.61 percent. Highest DI was noticed in Jeemarali (47.61%) followed by Bokkhalli (47.36%) villages of Nanjangud taluk and lowest PDI of 21.42 percent was recorded in Gaddebailu village of T. Narasipura taluk. In Uttara Kannada district, the major paddy cultivars such as, Intan, Ankur saali, Antar saali, MTU-1001 and Dodda saali were cultivated. Survey was carried out in Yellapura and Sirsi taluks. The average DI of the district was 6.31 percent. The DI in the surveyed villages was in the range of 3.70 to 9.52 percent. Hirehalli and Chauti villages of Sirsi and Yellapura taluks recorded highest DI of 9.52 percent and least PDI was noticed in Katur village of Sirsi taluk (Table 1).

Table 1: Different districts surveyed during *kharif*-2022 to assess sheath blight disease incidence

Sl. No.	District	Taluk	Villages	DI	Mean DI Taluks	Mean DI District
1.	Dharwad	Dharwad	Mandihal	3.22	6.04	6.04
			Jodalli	6.66		
			Hire honalli	9.52		
			Mugad	4.76		
2.	Haveri	Ranebennur	Makanur	42.85	20.84	20.84
			Mudenoor	19.04		
			Timmapanahalli	14.81		
			Mylara	11.11		
			Kanchargatti	18.51		
			Chouddayyadanpur	20.83		
			Haralahalli	21.05		
			Chikka kuruvatti	13.79		
			Havanur	20.68		
			Medleri	21.42		
			Harivi	37.50		
			Udagatti	19.35		
			Jaalimadi	16.12		
			Airani	22.58		
			Nadiharahalli	12.90		
3.	Mandya	Shrirangapattana	Arkere	27.58	29.24	27.70
			Garakahalli	31.57		
			Kodiyala	21.05		
		Mandya	Bevinahalli	26.66	21.05	
		Madduru	Gejjala gere	30.76	28.71	
			Mabbalgere	27.58		
4.	Mysuru	Mysuru	Mysuru	23.80	27.38	37.47
			Madakalli	25.00		
			Chikkayanahalli	33.33		
		Nanjangud	Basavanapura	38.09	42.11	
			Moodahalli	42.85		
			Kempisiddehundi	39.13		
			Immavu	37.50		
			Hadinaaru	34.61		
			Bokkhalli	47.36		
			Sutturu	45.00		
			Jeemaraali	47.61		
			Biligere	45.45		
			Kalalli	43.47		
		T. Narasipura	Thiruma kudalu	55.55	34.77	
			Sosle	47.05		

			Vyasarajapura	23.52		
			Kagalipura	22.22		
			Atthalli	38.88		
			Gaddebailu	21.42		
5.	Uttara kannada	Yellapura	Hosulli	4.54	7.24	6.31
			Kiravatti	4.34		
			Kollikeri	9.09		
			Bavigadde	8.69		
			Chauti	9.52		
		Sirsi	Bhairambi	3.84	5.16	
			Kalebailu	3.70		
			Katur	3.57		
			Hirehalli	9.52		

Among the different taluks surveyed across different districts, overall mean DI of ShB was ranged from 6.04 to 42.11 percent of which, highest mean DI was recorded from Nanjangud (42.11%) followed by T. Narasipura (34.77%) and least incidence of 6.04 percent was recorded in Dhawad. (Fig. 1, Table 1)

Among the districts, the mean highest DI (37.47%) was observed in Mysuru, followed by Mandya (27.70%), Haveri (20.84%), Uttara Kannada (6.31%) and the least severity of 6.04 percent was observed in Dharwad (Fig. 2).

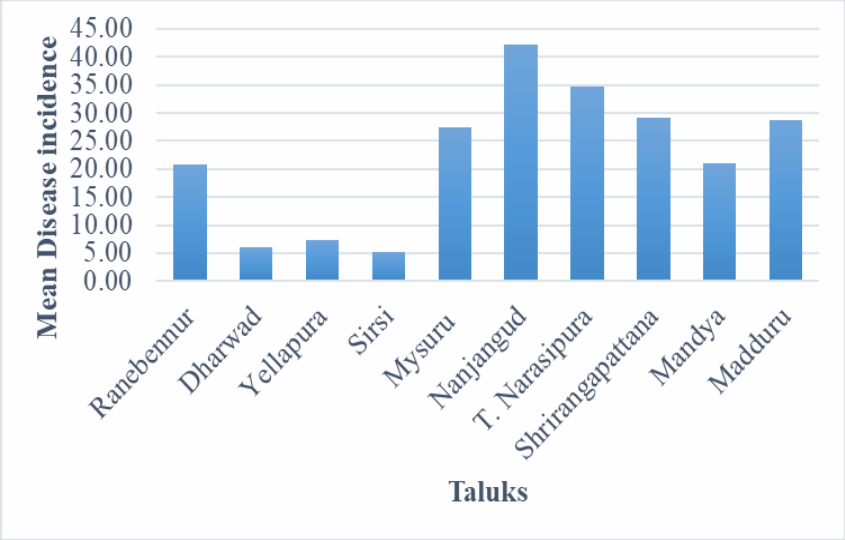

Fig 1: Disease incidence of sheath blight disease in different taluks of Karnataka during *Kharif*- 2022

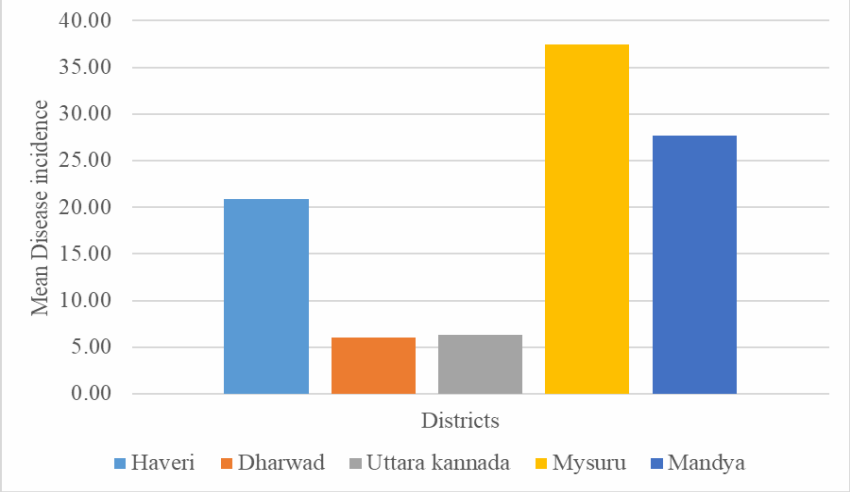

Fig 2: Disease incidence of sheath blight disease in different districts of Karnataka during *Kharif*-2022

Our results are in accordance with Nagaraj, 2016 and Umesh, 2014 where they have observed high disease severity (24.66 and 30.78 PDI) of ShB in Mandya and Mysuru regions and lower ShB severity in Dharwad and Uttara Kannada districts. Low disease severity in these areas may be attributed to cultural practices followed by farmers like, sowing through direct seeded rice, increased spacing and use of land races. Higher incidence of ShB in Mysuru and Mandya districts is related to growing of susceptible varieties, thick planting and following transplanting method of cultivation. Our findings

are supported by studies of Thera, 2021 where, they have also mentioned large scale monocropping of susceptible variety and flooding the fields facilitates pathogen dispersal and higher incidence of ShB disease.

Conclusion

Sheath blight disease is a major disease of rice in Karnataka. The ShB disease was severe in the Mandya and Mysuru districts of Karnataka compared to Dharwad and Uttara Kannada districts. Growing of traditional land races and practicing DSR method in the hilly ecosystem is major factor for the lower disease epidemic, which can be effectively managed by modifying cultural practices and applying recommended fungicides at regular intervals. Hence, good cultural interventions are necessary to keep the disease under control.

References

1. FAO (Food Agriculture Organization) Rice market monitor; c2018. http://www.fao.org/economic/est/publicatio ns/rice-publications/rice-market-monitor-rmm/en/
2. Margani R, Widadi S. Utilizing Bacillus to inhibit the growth and infection by sheath blight pathogen, *Rhizoctonia solani* in rice. IOP conference series: Earth and environmental science, IOP Publishing, Bristol, 2018, 142(1).
3. Nagaraj T. Studies on status, variability and management of sheath blight of rice caused by *Rhizoctonia solani* (Kuhn) in Karnataka. Ph. D. (Agri) Thesis. Dept. of Plant Pathology, University of Agricultural Sciences, Raichur; c2016.
4. Pareja L, Fernandez AAR, Cesio V, Heinzen H. Analytical methods for pesticide residues in rice. Trends in Analytical Chemistry. 2011;30:270-291.
5. Thera UK, Timsina A, Ramaswamy N, Sowmya V, Singh V. Survey and incidence of rice sheath blight in major rice growing areas of eastern Uttar Pradesh. International Journal of Chemical Sciences, 2021;9:2164-2167.
6. Umesha CS. Studies on disease sceneno in direct seeded rice with special reference to sheath blight caused by *Rhizoctonia solani* Kuhn. MSc. (Agri) Thesis. Dept. of Plant Pathology, University of Agricultural Sciences, Raichur; c2014.