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Survey on severity of sheath rot of rice caused by *Sarocladium oryzae* (Sawada) Gams and Hawksworth in Northern Karnataka and parts of Andhra Pradesh

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Abstract

Sheath rot of rice caused by *Sarocladium oryzae* (Sawada) Gams and Hawksworth has become potentially destructive disease. A roving survey was carried out to know the severity of sheath rot in different locations of six districts in Northern Karnataka and two districts in Andhra Pradesh. Among the different places surveyed, high per cent incidence was recorded in Khanapur (35.59) and high PDI was noticed in Arabhavi (37.78). Among the eight districts, high per cent incidence (27.89) and PDI (22.42) was recorded in Dharwad. Among varieties grown in different districts maximum per cent incidence was observed in Sonamasuri (29.69). Among different sowing conditions drill sown paddy showed maximum disease incidence and PDI and the PDI was maximum in paddy grown in black soils.

Keywords: disease incidence, rice, roving survey and sheath rot

Introduction

Rice (*Oryza sativa* L.) commonly known as Asian rice is an important cereal crop grown throughout the world. It is a staple food of 60 per cent of world's population and was first domesticated in the region of the Yangtze River valley in China. Rice suffers from many of the diseases caused by fungi, among them sheath rot caused by *Sarocladium oryzae* (Sawada) Gams and Hawksworth has become more prevalent in recent decades.

Survey on the disease in the field gives information about the extent of sheath rot disease affecting the crop. Sheath rot disease is very common in rainfed rice or rice during rainy season; however, systematic survey on the incidence and severity in northern Karnataka is lacking. Considering the above facts, survey was undertaken to know the incidence and severity of sheath rot in Dharwad, Belgaum, Uttara Kannada, Raichur, Yadagir, Koppal districts and parts of Andhra Pradesh (East Godavari and West Godavari).

Material and Methods

The intensive roving survey was conducted during *kharif* to know the incidence and severity of sheath rot in the farmer's fields in Belgaum, Dharwad, Uttara Kannada, Yadagir, Koppal, Raichur districts in Karnataka, East Godavari and West Godavari districts in Andhra Pradesh. In each district five villages were selected and in each village two fields were surveyed. In field, plants were selected in zigzag manner and the severity of sheath rot disease of rice was recorded by following 0-9 scale (Anonymous, 1996).

Grade Reaction

0	No infection
1	Small lesions
3	5% area of boot leaf sheath with lesions
5	6-25% area of boot leaf sheath with lesions
7	26-50% area of boot leaf sheath with lesions
9	>50% area of boot leaf sheath with lesions

$$\text{Percent Disease Incidence} = \frac{\text{Number of infected tillers}}{\text{Total number of tillers}} \times 100$$

Per cent disease index (PDI) was calculated by using following formula proposed by Wheeler (1969).

$$\text{Percent Disease Index (PDI)} = \frac{\text{Sum of the individual disease ratings}}{\text{Number of fruits/leaves observed}} \times \frac{100}{\text{Maximum disease grade}}$$

Results and Discussion

Survey on the incidence and severity of sheath rot of rice reveals the magnitude of the problem on hand and serves as a precursor for evolving the management strategies. In the present study roving survey carried out in six districts of northern Karnataka and two districts of Andhra Pradesh which is presented in Table 1.

Table 1: Survey on severity of sheath rot of rice caused by *Sarocladium oryzae* in Northern Karnataka and Andhra Pradesh.

Sl. No.	District	Village	Soil	Type of cultivation	Varieties	Per cent disease incidence	Per cent disease index
1	Dharwad	Honnapur	Black soil	Drill sowing	Doddiga	23.64	15.56
		Daddikamalapur	Black soil	Drill sowing	Siri 1253	26.23	13.33
		Kelegeri	Red soil	Drill sowing	Sona masuri	31.37	20.98
		Nigadi	Black soil	Drill sowing	Basumati	28.57	28.89
		Khalagatigi	Red soil	Drill sowing	Sali batta	29.63	33.33
Mean 27.89							22.42
2	Belgaum	Khanapur	Black soil	Drill sowing	Sona masuri	35.59	20.89
		Arabhavi	Black soil	Drill sowing	Basumati	29.63	37.78
		Bailhangal	Red soil	Drill sowing	Abhilash	24.00	11.11
		Gundenatti	Black soil	Drill sowing	Doddiga	20.37	15.56
		Bidi	Black soil	Drill sowing	Basumati	25.49	22.27
Mean 27.01							21.52
3	Uttara Kannada	Sirsi	Black soil	Transplanting	Asha	25.00	18.89
		Sirsi farm	Red soil	Transplanting	Sona masuri	25.49	14.44
		Alnavar	Red soil	Drill sowing	Rasi	27.08	28.89
		Yellapur	Black soil	Drill sowing	Jaya	28.21	20.00
		Siddapur	Red soil	Transplanting	Sirsi sanna	28.57	17.78
Mean 26.87							20.00
4	Yadgir	Shalapur	Black soil	Transplanting	Jaya	22.50	28.89
		Surpur	Red soil	Transplanting	Jaya	17.86	11.11
		Yadagir	Red soil	Transplanting	Sona masuri	26.32	17.78
		Kembhavi	Black soil	Transplanting	Rasi	16.13	20.00
		Surpur campus	Red soil	Transplanting	Jaya	30.56	13.33
Mean 22.67							18.22
5	Koppal	Kukanur	Black laterite soil	Transplanting	Shakti	24.24	17.78
		Gangavati farm	Black soil	Transplanting	Hybrid rice	27.27	28.89
		Sivaguppa	Black soil	Transplanting	Vani	21.05	11.11
		Gangavati	Black soil	Transplanting	Mangala	17.65	20.00
		Kustagi	Black soil	Transplanting	Intan	34.88	28.89
Mean 25.01							21.33
6	Raichur	Raichur farm	Black soil	Transplanting	Shakti	21.49	17.78
		Lingasgoor	Black soil	Transplanting	Vani	22.27	8.89
		Asihal	Black soil	Transplanting	Jaya	20.00	22.22
		Kavital	Red soil	Transplanting	Shakti	16.57	14.44
		Siravar	Black soil	Transplanting	Vani	26.92	28.89
Mean 21.45							16.44
7	East Godavari	Timmapuram	Black soil	Transplanting	Samba mahsuri	10.5	8.89
		Penumarti	Black alluvial soil	Transplanting	Swarna	12.0	13.33
		Samalkot	Black soil	Transplanting	Swarna	8.5	11.11
		VKpuram	Black soil	Transplanting	Samba mahsuri	16.57	24.44
		Sirivada	Black soil	Transplanting	MTU 1001	20.00	17.78
Mean 13.51							15.11
8	West Godavari	Vatluru	Black soil	Transplanting	Swarna	12.5	13.33
		Kalapurru	Black soil	Transplanting	MTU 1001	14.93	15.56
		Veluru	Black soil	Transplanting	MTU 1001	20.00	20.0
		Veeravalli	Alluvial soil	Transplanting	Swarna	8.67	6.67
		Satrapadu	Black soil	Transplanting	Samba mahsuri	16.57	15.56
Mean 14.53							14.22

Per cent disease incidence ranged from 8.5 to 35.59 with highest per cent incidence 35.59 was recorded in Khanapur village of Belgaum district followed by 34.88 per cent in Kustagi (Koppal) and 31.37 per cent in Kelageri (Dharwad). The least per cent incidence 8.5 observed in Samalkot (East Godavari). Among different locations Per cent Disease Index

(PDI) ranged from 6.67 to 37.78. Arabhavi (Belgaum) recorded highest PDI (37.78) followed by 33.33 in Khalagatigi (Dharwad). Least PDI 6.67 was recorded in Veeravalli (West Godavari), 8.89 in Timmapuram (East Godavari), Lingasgoor (Raichur) villages. District wise severity of sheath rot of rice given in Table 2. The maximum

per cent disease incidence (27.89) and per cent disease index (22.42) recorded in Dharwad followed by Belgaum (27.01 and 21.52). Lowest incidence (13.51) was recorded in East Godavari and lowest PDI (14.22) recorded in West Godavari.

Table 2: District wise mean severity of sheath rot of rice caused by *S. oryzae* in Northern Karnataka and Andhra Pradesh.

District	Mean percent incidence	Mean Percent disease index
Dharwad	27.89	22.42
Belgaum	27.01	21.52
Uttara Kannada	26.87	20.00
Yadgir	22.67	18.22
Koppal	25.01	21.33
Raichur	21.45	16.44
East godavari	13.51	15.11
West godavari	14.53	14.22

Among the varieties grown in different districts (Table 3) maximum per cent incidence was observed in sona masuri type (29.69) followed by sali batta (29.63) and Sirsi sanna (28.57) and least incidence was observed in swarna (10.41) and samba mahsuri (14.54). The PDI was more in sali batta (33.33) followed by basumati rice (29.64), hybrid rice (28.89) and intan (28.89). The lowest PDI was observed in vani (10.00) and abhilash (11.11). Among different types of soils on which the rice was grown, the incidence was more in black laterite soils (24.24) followed by red soils (23.25). PDI was maximum in black soils (20.68). Least incidence and PDI were observed in alluvial soils. Within the two different sowing conditions, drill sowing showed highest per cent disease incidence of 27.29 and PDI of 21.21 compared to transplanting with per cent disease incidence 20.43 and PDI 17.08.

Table 3: Variety wise mean severity of sheath rot of rice caused by *S. oryzae* in Northern Karnataka and Andhra Pradesh.

Variety	Percent disease incidence	Percent Disease Index
Doddiga	22.0	15.56
Siri 1253	26.23	13.33
Sona masuri	29.69	18.52
Basumati	27.89	29.64
Sali batta	29.63	33.33
Abhilash	24.00	11.11
Asha	25.00	18.89
Rasi	21.60	24.45
Jaya	22.73	16.56
Sirsi sanna	28.57	17.78
Shakti	20.76	13.33
Hybrid rice	27.27	28.89
Vani	21.66	10.00
Mangala	17.65	20.00
Intan	34.88	28.89
Samba mahsuri	14.54	16.29
Swarna	10.41	11.11
MTU 1001	18.31	17.78

Shahjahan *et al.* (1977) [3] conducted survey in five major rice growing areas of south eastern Lougiani. He observed sheath rot of rice was widely distributed in all the five rice growing areas of Lougiani. of the tiller examined, 11.4 per cent showed symptoms of sheath rot. Srinivasan (1981) [4] reported that heavy infection of *Sarocladium oryzae* resulted in greater yield loss in Thanjavur delta of Tamil Nadu. Girish (1999) [2] conducted survey in different locations of Karnataka and he

identified sheath rot incidence ranged from 26.4 to 44.5 per cent in Bangalore area, and observed the maximum incidence in Tumkur 47.3 per cent. The present findings are also in conforming with the work of Girish (1999) [2] who reported the sheath rot incidence ranged from 26.4 to 44.5 per cent in Bangalore area.

Conclusion

The roving survey carried out in northern Karnataka and Andhra Pradesh revealed that highest per cent disease incidence (27.89) and per cent disease index (22.42) of disease was recorded in Dharwad district. Correspondingly, the lowest disease incidence (13.51) was recorded in East Godavari and lowest PDI (14.22) recorded in West Godavari. Among the varieties, Sona Masuri was found more susceptible and recorded highest PDI. The maximum disease incidence and severity were observed in drill sowing paddy.

References

1. Anonymous, IRRI standard evaluation system for rice, International Rice Testing Programme, Philippines, 1996.
2. Girish B. V., Investigation on sheath rot disease of rice caused by *Sarocladium oryzae* (Saw.) Gams and Hawkswarth. M. Sc. (Agri.) Thesis, Uni. Agric. Sci., Bangalore, 1999.
3. Shahjahan A.K.M., Harahap Z. and Rush M.C., Sheath rot of rice caused by *A. oryzae* in Louisiana. Plant Dis. Reprt. 1977;61:307-310.
4. Srinivasan, S., Yield losses caused by sheath rot. Inter. Rice. Res. News lett., 1981;5:2.
5. Wheeler, B. E. J., An Introduction to Plant Diseases, John Wiley and Sons Ltd. London, 1969, 301.