

## DISTRIBUTION OF RICE COLLAR ROT FUNGI IN MANIPUR AND THEIR BEHAVIOUR TO DIFFERENT PLANT GROWTH MEDIA

L. N. K. SINGH and N. I. SINGH

Department of Plant Pathology, College of Agriculture, Central Agricultural University, Imphal, India.

*Pestaliopsis versicolor* and *Chaetomium globosum* are the rare rice collar rot fungi discovered from Manipur, India. These two fungi bring considerable damages to rice plant growing in Manipur. The present piece of work is to survey the locations where the intensity of damages brought by the fungi to rice plants cultivated at different regions of Manipur. The growth behaviours of the fungi to different plant growth media are also discussed.

**Keywords:** *Chaetomium globosum*; Distribution and growth behaviour; Growth media; *Pestaliopsis versicolor*; Rice collar rot fungi.

Manipur having its high humidity and moderate temperature and also facing constant rainfall serves the luxurious growth of many different types of pathogenic fungi. Many of these fungi bring considerable damages to agriculture crops. Amongst these fungi there are fungi which bring about substantial harmful effects to rice plants. Two types of such fungi, viz., collar rot fungi, were first discovered in Manipur by Singh *et al.*<sup>1</sup>. They are : *Pestaliopsis versicolor* and *Chaetomium globosum*. The damage intensities of these fungi vary from regions to regions/localities to localities situated in Manipur. The present work is to study the regions/localities where the intensities of the damages are conspicuous. The study also relates to the behaviour of these two fungi towards the plant growth media.

During the two crop seasons (2004-2005) several visits were made to different five districts of Manipur viz., Imphal, Thoubal, Chandel, Bishnupur and Senapati. Diseased samples were collected from these localities and isolated the fungi following the methods adopted by Devi<sup>2</sup> to study the intensities of the damages brought by these two fungi.

Seven different culture media, viz., Asthana and Hawker's media Potato dextrose broth media, Oatmeal media, Czapek Dox media, Richard's media, Corn meal media and Sobouraud's conservation media were prepared as per the methods adopted by Riker and Riker<sup>3</sup>. The isolated fungal mycelia were inoculated to these media to study the growth behaviour.

In the case of distribution of these collar rot fungi the results show the fungi were well distributed at various localities in different districts of Imphal, Thoubal, Chandel, Bishnupur and Senapati, where the exotic high yielding rice varieties were grown. However, the maximum damages caused by these fungi were recorded from Imphal district

while the minimum distribution was at Senapati district. Favourable distributions also recorded at the localities of Thoubal and Bishnupur districts (Table 1). In minute observations it was observed that in these localities where considerable damages were brought by these fungi, might be due to the cultivation of high yielding rice varieties. However, the localities where the high yielding varieties cannot be grown, the distribution of these fungi was found minimum. Senapati and Chandel districts are situated in the hilly areas and most of the rice grown was of local and indigenous varieties and as the result of which there was least attack of these fungi. It appears that the local and indigenous rice varieties might have produced certain metabolites which resist the fungal attack, whereas in the case of high yielding rice varieties there might be less production of these metabolites. On the other hand these high yielding rice varieties might have secreted other types of metabolites which are attractive to these fungi. These findings are in agreement with the findings of Amin *et al.*<sup>4</sup> and Devi<sup>2</sup>.

All the media under study supported the mycelial growth of the collar rot fungi. Maximum mycelial growth of *P. versicolor* was found in Richard's media followed by Potato dextrose broth media but least in Czapek Dox media (Table 2). Similarly, Palarpaman<sup>5</sup> reported that isolates of *Colletotricum curcuma* showed the maximum growth on Richard's media and Dextrose asparagine phosphate media followed by Czapek Dox media. Potato dextrose broth supported maximum mycelial growth of *C. globosum* followed by Corn meal but least in Czapek Dox. Similarly Potato Dextrose broth was found to be best for growth of *Acrocyllidium oryzae*<sup>6</sup> and *Sarocladium oryzae*<sup>7</sup>. Devi<sup>2</sup> observed the maximum mycelial growth of three fusaria sheath rot fungi in Potato Dextrose broth followed by host extract and Richard's media. From the findings of the

**Table 1.** Distribution of fungi associated with Collar Rot of Rice at various localities in different districts of Manipur.

S.No.	District	Locality	No. of Fields Visited	Frequency of Fungus <i>P. versicolor</i> (%)	Frequency of Fungus <i>C. globosum</i> (%)
1.	Imphal	Lamsang, Lamphelpat, Heibongpokpi, Sawombung, Lamlai, Langjing, Khumbong, Keirao, Heingang, Khonghampat and Langthabal.	66	70	25
2.	Thoubal	Thoubal Kiyam, Wangbal, Ngangoupat, Waithou, Wangjing, Yairipok, Khongjom, Kakching and Kakching Khunou.	54	69	12
3.	Chandel	Sugunu, Pallel and Chandel	18	30	15
4.	Bishnupur	Nambol, Oinam, Bishnupur, Moirang and Wangoo.	30	50	20
5.	Sanapati	Sekmai	6	20	10
Total			174		

**Table 2.** Effect of different media on growth of fungi associated with Rice Collar Rot.

Sl.No.	Media	<i>P. versicolor</i> growth* (mg)	<i>C. globosum</i> growth* (mg)
1.	Asthana & Hawker's Medium	231.60	166.63
2.	Potato dextrose broth	368.69	263.00
3.	Oat meal	52.80	47.88
4.	Czapex dox medium	32.38	33.63
5.	Richard's medium	675.00	82.50
6.	Corn meal	317.50	258.00
7.	Sobouraud's Conservation	45.50	51.88
8.	Control	0.00	0.00
* Mean of 5 replications CD 5%		114.42	38.99

above mentioned researcher's it may be concluded that the collar rot fungi of rice show the similar behaviour towards the cultural media.

#### Acknowledgement

The Senior author express deep sense of gratitude to the Head of Department, Plant Pathology, College of Agriculture, Central Agriculture University, Imphal and authority of the University for extending help, support and encouragement during the course of research work, and also providing laboratory facilities.

#### References

1. Singh N 1 Devi, Tombisana R K and Singh NongdrenKhomba L 1995, *Pestalotiopsis versicolor* a causal agent of rice collar rot. *Plant Disease* 79(11) 1186.
2. Devi, Tombisana R K 1991, Studies on fungi associated with rice sheath rot. Ph. D. Thesis, Manipur University.
3. Riker A J and Riker R S 1936, Introduction to Research on Plant diseases. John, S. Swift. Co., St. Louis.
4. Amin, K S Sharma, Sharma B D and Das C R 1976, Occurrence in India of sheath rot of rice caused by *Acrocyndrium*. *Pl. Dis. Repts.* 58 358-360.
5. Palarpamar M Y 1987, Growth and sporulation of *Colletotricum capsici* and *Colletotricum curcumae* on different culture media. *Indian J. Mycol. Pl. Pathol.* 17(2) 208.
6. Tasugi H and Ikeda Y 1956, Studies on the sheath rot of rice plant caused by *Acrocyndrium oryzae*. *Swada Bull. Nat. Agric. Sci.* Tokyo Ser C.6 151-166.
7. Chien C C and Thseng FM 1981, Physiological and biochemical studies of sheath rot pathogen. *J. Agric. Res. China* 30 1-4.