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Research Article

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Antagonistic action of *Trichoderma* sp. on *Colletorichum graminicola* causing anthracnose on sugarcane in Gondia district (M.S.)

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ABSTRACT

Present study is carried on performance of different isolates against Colletotrichum graminicola causing anthracnose on sugarcane. Anthracnose disease is controled by non-pathogenic fungi like Trichoderma virde and T. longibranchiatum. These pathogenic fungi reduce sugar quality after infection. Trichoderma species are tested for antagonistic activity and shows positive result against pathogenic fungi. Antagonistic activity line is observed clear in position. The redial mycelia growth of the isolates (non-pathogenic fungi) on cultural petridish shows different result from each other.

Key words: *Sugarcane, Antagonistic activity, Colletotrichum graminicola, isolates and anthracnose.*

INTRODUCTION

Sugarcane is most importance cash crop of Gondia district. This was traditional crop in very little area of Gondia for jagerry production. Now area is increasing regularly under sugarcane cultivation at commercial level for sugar production. Anthracnose is very rare disease in Gondia district, but in all over world this is serious and wide spread disease. Numbers of other *Colletotrichum* specieses are *C. Gloeosporioides*[5] and *C. acutatum*[2]. The use of fungi to control the disease will be helpfull for future practices. Antagonistic activity of these isolate with the *Collectotrichum graminicola* will be potent source of fungicides. Present study was undertaken to evaluate antifungal activity against anthracnose on sugarcane in Gondia district.

MATERIAL AND METHODS

Screening of phylloplane mycoflora on sugarcane for antagonistic study with the help of both direct and indirect methods.

Direct Method:

a) Field Observation: Survey has been carried out monthly to observe the disease and photographs were taken with the help of Nikon digital camera (6.0 megapixels). It gives direct images of object on screen.

b) Laboratory Observation: Infected leaves observed and collected in sterile sepretate polyethylene bags as per infected morphological appearance from different area randomly with one month interval.

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Laboratory section done by section cutting of infected yellow and green leaves. 1% aqueous solution of lactophenol cotton blue was used as stain and microscopic photographs also taken.

Indirect Method:

Infected leaf cut into to 2 cm. pieces and washed with tap water then transfer in 0.1% mercuric chloride ($HgCl_2$). Infected leaf pieces transferred into flask containing 100 ml sterile distilled water and washed serially for 5 – 6 times with changing sterile distilled water in aseptic condition these small leaf pieces about 2 cm long were transferred on sterile filter paper so as the blot dried for inoculation.

Culture of Fungi:

Washed and blot dried leaf pieces transferred on to surface of culture media (Zapak Agar Dox) in Petri dishes by spot inoculation method[1] were incubated at room temperature for 9 days or till the antagonistic activity appear to get uniform result three replicate plates were prepared for each 24 sample.

Antagonistic Activities:

The antagonists are selected from phyllophane of sugarcane against *C. graminicola* causing anthracnose. The observation on redial mycelial growth of pathogenic fungi were recorded and observed till the 3, 6, 9th day after incubation.

RESULTS AND DISCUSSION

Colletotrichum graminicola shows fast growth submerged in media (figer-1). In the result of antagonistic activity shows different growth activity line and colour in testing petridish (figer-2 to 3). The pure cultures of *C. graminicola* grow regularly but testing pathogen cultural plates show variation in redial mycelial growth (D to I). When pathogenic and non-pathogenic fungi react with each other that time they change colour form activation line zone. Radial mycelial growth of non-pathogenic fungi as well as pathogenic fungi after 3, 6 and 9th day inoculation and compared with tested petridish, given in (Table- 1).

Observations of antagonistic activity are recorded from the time of formation of inhibition zone or after contact between pathogen and non pathogen. These findings are correlated with Pan and Jash[4] who reported the different isolates of *Trichoderma* spp. Shows mycoparistic activities against *Macrophomina phasdina*. Certain antagonistic fungi were isolated in the previous study from the rhizosphere and rhizoplane of perennial grasses in India, for their antagonism *in vitro* to *C. graminicola* root coloniation. He tested 138 isolates from which 89 were antagonistic[3]. Above table shows variability in redial mycelia growth of non pathogen such as *T. viride* and *T. longibranchiatum* but growth of pathogen dose not shows variation after antagonistic activity. Hence growths of pathogens stop in testing petridish. On the other hand growth of pure culture of *C. graminicola* grow regularly because no anti-react of other isolates in it.

Plates

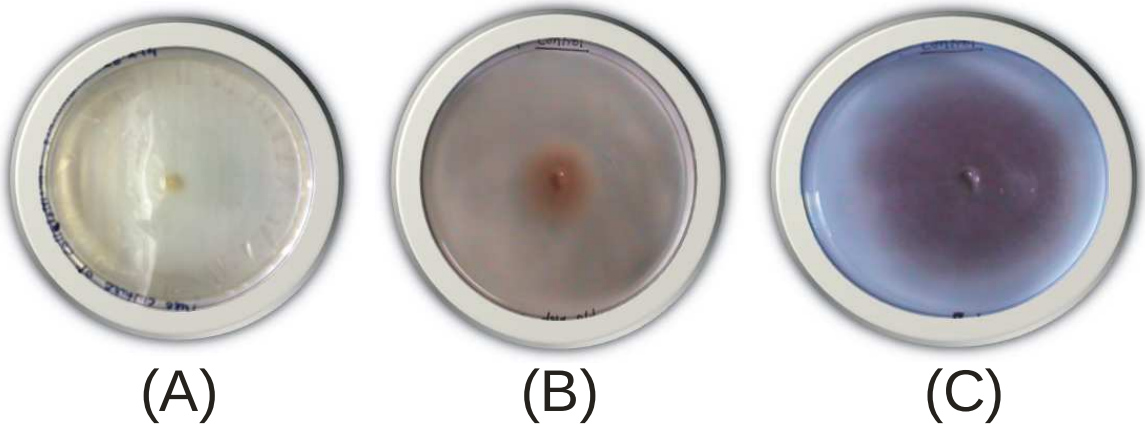

Fig.1: (A to C) : *pure culture(pathogen) grow regularly*

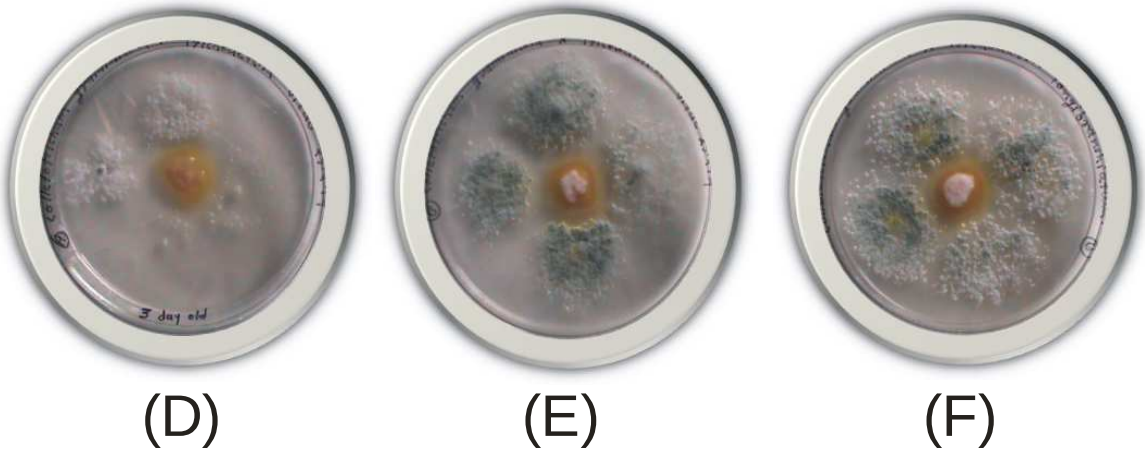

Fig. 2: (D to F) : *C. graminicola x T.longibranchiatum*

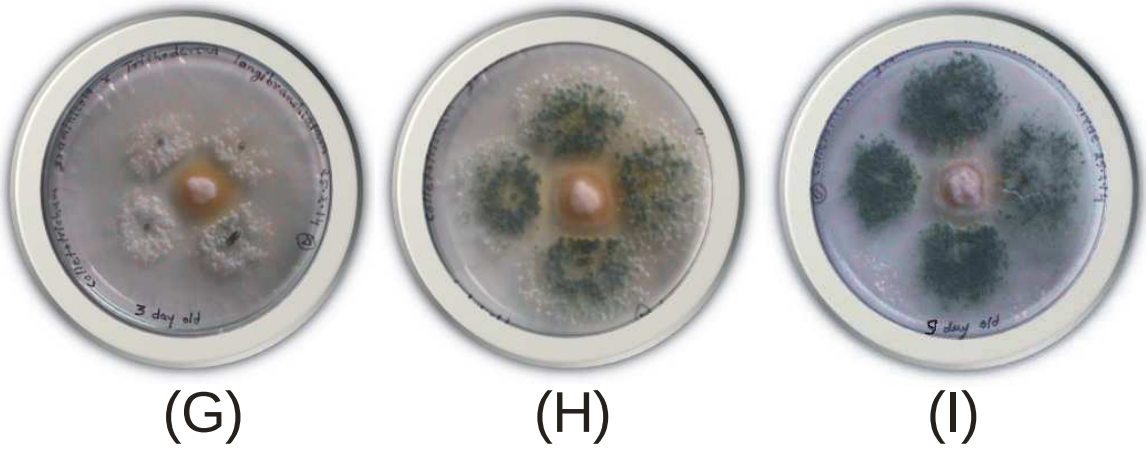

Fig.3: (G to I) : *C. graminicola x T. viride*

Table-1: Comparison of radial growth between pathogen and non- pathogen

S. No	Name of isolates (non – pathogen)	Radial Growth of Control Fungi (non -pathogen) in cm (3, 6 and 9th DAI).			Effect on radial growth of treated fungi (*C. graminicola*)		
		3 DAI	6 DAI	9 DAI	3 DAI	6 DAI	9 DAI
1	*Trichoderma viride*	3	3.4	3.5	2.6	2.6	2.6
2	*T. longibranchiatum*	3	4.5	4.5	2.5	2.6	2.6

CONCLUSION

Present antagonistic activity study showing different mark of inhibition zone. Fungal inhibition zone or activity line shows positive activity against *C. graminicola*. Hence this study suggested that these antagonists one capable to control anthracnose disease. This is very useful to introduce in this area of sugarcane field.

Acknowledgement

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