

# Screening Of *Trichoderma* & Copper Fungicide Against *Colletotrichum Capsici* Causing Anthracnose Of Chilli Under In Vitro Conditions .

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**Abstract:** Anthracnose caused by *Colletotrichum capsici* is one of the most important diseases of chilli. In the present investigation, inhibitory effect of different *Trichoderma* species were observed in lab condition. It was found that all four treatments, were efficient in mycelia growth inhibition of *Colletotrichum capsici*. *Trichoderma harzianum* gave best result in dual culture with growth inhibition of 83.8% against whereas *T. viride* showed (83.3%). & Carbendazim 79.4% mycelium growth inhibition respectively.

**Keywords:** *Colletotrichum*, *Trichoderma*, inhibition

## 1. INTRODUCTION

Soil biodiversity plays a very important role in the sustainability of agriculture systems and it also indicates the level of health of soil, particularly while considering the richness of microorganisms which are involved in plant disease control. The use of microbial diversity to manage disease of crop plants falls into the category of biological control. Researchers are therefore attempting to enhance the effectiveness of antagonists in the cropping field, thus increasing suppressive ness. Biocontrol of plant diseases by other microorganisms is found to be a more effective and environmentally beneficial substitute to the harmful chemical fungicides (Shalini and Kotasthane, 2007, Chitra Mani & Kumar, P. (2020); Sharma, M., & Kumar, P. (2020); Chand, J., & Kumar, P. (2020); Naik, M., & Kumar, P. (2020); Kumar, P., & Naik, M. (2020); Kumar, P., & Dwivedi, P. (2020), Devi, P., & Kumar, P. (2020); Kumari, P., & Kumar, P. (2020); Kaur, S., & Kumar, P. (2020); Devi, P., & Kumar, P. (2020); Sharma, K., & Kumar, P. (2020); Kumar, S. B. P. (2020); Devi, P., & Kumar, P. (2020); Chand, J., & Kumar, P. (2020). *Trichoderma* species are best known to contain antifungal activity against plant diseases since 1930s (Hjeljord and Tronsmo, 1998). Their different species and isolates are available commercially (Freeman *et al.*, 2004). *T. harzianum* solely or in mixture with different *Trichoderma* species or adjuvant, has been useful in management of several diseases like damping-off in radish, maize and soybean (Lifshitz *et al.*, 1985) and tomato grey mould disease (Migheli *et al.*, 1994). Sugarcane is one of the important commercial crops playing major role in agriculture and industrial economy of the country.

## 2. MATERIAL AND METHODS

Three different *Trichoderma* species presented in **Table 1** were assessed for comparative efficacy against *Colletotrichum capsici* by dual culture method. Nine mm diameter disc of test fungus and the antagonistic fungi were cut and were kept opposite to each other at a distance of 5 mm from the edge of Petri dish. Same disc of test fungus was placed on another petri plate containing PDA, which served as Untreated (Control). Individual treatment was duplicated 3 times and incubated at  $25 \pm 2^{\circ}\text{C}$ . Per cent growth inhibition of test pathogen was found out by using given below formula (Vincent, 1947 and Behzadet *al.*, 2008).

$$\text{Inhibition \%} = \frac{\text{CONTROL} - \text{TREATED}}{\text{CONTROL}} \times 100$$

Where, C = Mycelial growth of the test Pathogen in controlled plate (mm)

T = Mycelial growth of the test Pathogen in treatment (mm)

**Table 1.** List of *Trichoderma* & copper fungicide species used against *Colletotrichum capsici*

Treatment	Name of Bio agent / Botanical
T1	<i>Trichoderma viride</i>
T2	<i>Trichoderma harzianum</i>
T3	Copper oxychloride 50 WP
T4	Carbendazim,

## 3. RESULT AND DISCUSSION

Effect of four different species (Table 2) were evaluated under *in vitro* condition. *Trichoderma* isolates were cultured along with *Colletotrichum capsici* in petriplates for a week and it was found that all the species of *Trichoderma* reduced the mycelial growth of *Colletotrichum falcatum*. *Trichoderma harzianum* gave best result in dual culture with minimum radial growth of 14.5mm and maximum growth inhibition of 83.8% followed by *T. viride* with radial growth of 15mm and growth inhibition of 83.3mm, *T. viride* with 83.3 mm growth inhibition, with 77.2% growth inhibition whereas copper oxychloride showed minimum growth inhibition of 78.3 % with maximum mycelial growth of 19.5mm. Singh et al. (2004) observed inhibitory activity of different *Trichoderma* isolates against *Colletotrichum spp.* Webster and Lomas (1964) reported that *Trichoderma viride* produces gliotoxin and viridin which easily inhibit the growth of pathogens (Kumar, P. (2019); Kumar, D., Rameshwar, S. D., & Kumar, P. (2019); Dey, S. R., & Kumar, P. (2019); Kumar et al. (2019); Dey, S. R., & Kumar, P. (2019); Kumar, P., & Pathak, S. (2018); Kumar, P., & Dwivedi, P. (2018); Kumar, P., & Pathak, S. (2018); Kumar et al., 2018; Kumar, P., & Hemantaranjan, A. (2017); Dwivedi, P., & Prasann, K. (2016). Kumar, P. (2014); Kumar, P. (2013); Kumar et al. (2013); Prasann, K. (2012); Kumar et al. (2011); Kumar et al. (2014).

**Table 2.** Effect of different species of *Trichoderma* on the growth of *Collectotrichum falcatum*

S.No.	<i>Trichoderma</i> species	Colony diameter (mm)	Percent growth inhibition (%)
1.	<i>T. harzianum</i>	14.5	83.8

2.	Copperoxychloride 50 WP	19.5	78.3
3.	Carbendazim ,	18.5	79.4
4.	<i>T.viride</i>	15	83.3
	Control	90	00

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