

Phosphate Nutrition in Relation to Growth of *Colletotrichum capsici* Causing Leaf Spot of Turmeric

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Abstract: *The present investigation deals with the effect of three phosphate sources on the growth of Colletotrichum capsici causes the Leaf spot of Turmeric (Curcuma longa L.) belongs to family Zingiberaceae. The turmeric is an important spice in South Asian and middle Eastern cuisine. Each microorganism requires proper nutritional source for their growth. The nutritional source (phosphate sources) like ammonium dihydrogen orthophosphate, potassium dihydrogen orthophosphate and sodium dihydrogen orthophosphate were used against the pathogen. In the result it was found that 0.1% concentration of ammonium dihydrogen orthophosphate and sodium dihydrogen orthophosphate reduced the growth while potassium dihydrogen orthophosphate stimulated the growth of Colletotrichum capsici.*

Keywords: Colletotrichum capsici, phosphate nutrition, Curcuma longa

I. INTRODUCTION

Turmeric (*Curcuma longa L.*) is native of Southeast Asia and is grown commercially in that region, primarily in India. It is antioxidant, anti-inflammatory, anti-mutagenic, anti-carcinogenic, anti-coagulant, anti-infertility, anti-diabetic, anti-bacterial, anti-fungal, viral, anti-venom activities. (Sato et al. 2010) Turmeric is severely affected by the various fungal, bacterial and viral diseases. The leaf spot of turmeric caused by *Colletotrichum capsici*. Now a day's disease management is made necessary for high yield. Each microorganism requires proper nutritional source for their growth. The earlier workers studied the growth of various plant pathogens in different food sources, the present study deals with the effect of different phosphate sources on the growth of *Colletotrichum capsici* to know the nutrition requirement will help to control the growth of the pathogen.

II. MATERIALS AND METHODS

The infected material of turmeric (Leaf spot) were collected from the different localities of Udgir area during the period of 2021 to 2022. The infected plant material were brought to the Botany laboratory at Sambhajirao Kendre Mahavidyalaya Jalkot Dist. Latur in the Marathwada region of Maharashtra and isolated the pathogen on Czapek Dox Agar (CDA) medium, the pathogen is identified with the help of standard mycological literature (Subramanian, 1971), pure culture was maintained at $23 \pm 2^{\circ}\text{C}$ in BOD incubator for further study. For the study three phosphates sources like ammonium dihydrogen orthophosphate, potassium dihydrogen orthophosphate and sodium dihydrogen orthophosphate were used at 0.1% in Czapek Dox Agar (CDA) medium, 4mm freshly growing 8 days old pure culture of grown on agar medium and incubated at $28 \pm 2^{\circ}\text{C}$ The plates without source treated as control. After the 8 days of incubation linear growth of mycelium was measured at different intervals for five days.

III. RESULTS AND DISCUSSION

For the present investigation three phosphate sources like ammonium dihydrogen orthophosphate, potassium dihydrogen orthophosphate and sodium dihydrogen orthophosphate were used. In the present study it was found that 0.1% concentration of ammonium dihydrogen orthophosphate, and sodium dihydrogen orthophosphate reduced the growth while as potassium dihydrogen orthophosphate stimulated the growth of *Colletotrichum capsici*. (Table 1). The results obtained from the present investigation are agreed with Bhale (2002), Waghmare (2015), similarly other workers studied the effect of nutritional sources on the growth of different plant pathogens Patil (2009), Khilare and Rafi

(2011), Ramteke (2011), (Naim and Sharoubeem (1963), Steinber (1999), Wadikar (2002), Sharma and Mohinder Kaur, (2014).

Table. 1 Effect of Phosphates sources on the linear growth (mm) *Colletotrichum capsicicum* causing Leaf spot of Turmeric on CDA medium.

Sr. no	Phosphate source	Days and radial growth of pathogen in mm				
		2	4	6	8	10
1.	Potassium dihydrogen orthophosphate	16.28	24.64	44.30	57.10	67.21
2.	Sodium dihydrogen orthophosphate	14.30	19.71	31.40	38.56	44.22
3.	Ammonium dihydrogen orthophosphate	11.12	18.31	27.10	33.32	39.30
4.	Control	19.30	26.34	34.12	40.12	48.76

IV. CONCLUSION

For the management of *Alternaria solani* causing early blight of tomato, use of 0.1% concentration of Ammonium dihydrogen orthophosphate and Sodium dihydrogen orthophosphate is effective.

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