

EFFICACY OF ORGANIC AMENDMENTS ON GROWTH OF *Fusarium oxysporum* f. sp. *lycopersici*, THE CAUSAL AGENT OF WILT OF TOMATO

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ABSTRACT

All the organic amendments tested were found significant in reduction of mycelia growth of Fusarium oxysporum f. sp. lycopersici. Neem cake proved most effective in reduction of mycelia growth followed by mustard cake and cotton cake at 30 per cent. Vermicompost, FYM and castor cake were less effective at 10, 20 and 30 per cent. All the organic amendments were found effective in inhibition of mycelia growth of Fusarium oxysporum f. sp. lycopersici over control.

KEY WORDS: *Fusarium oxysporum f. sp. lycopersici, Management, Organic amendments, Tomato, Wilt*

INTRO DUCTION

Tomato is very important vegetable crops grown in India; the average yield of this crop on farmers' fields is poor in comparison to the other countries. One of the main constraints for poor yield is the biotic and abiotic stresses. Among biotics stresses, a large number of diseases incited by fungi, bacteria, viruses and nematodes affect to attain the optimum yield. Tomato is commonly affected by fungal diseases like early blight [*Alternaria solani* (Ellis and Mart.)], leaf blight [*Alternaria alternata* Fries (Keissler)], late blight [*Phytophthora infestans*, (De Barry)], septoria leaf blight [*Septoria lycopersici* Speg.), *Fusarium* wilt [*Fusarium oxysporum* f. sp. *lycopersici* (Sacc.) Snyder and Hansen)], *Verticillium* wilt (*Verticillium dahliae* Klebalum), *Anthraco*se [*Colletotrichum phomoides* (Sacc.) Chester] and phoma rot (*Phoma*

lycopersici Cooke) etc. Among them, *Fusarium* wilt of tomato caused by *Fusarium oxysporum* f. sp. *lycopersici* is one of the common and wide spread diseases. There was extensive use of high risk fungicides increases the chance of development of fungicide resistance isolates. Therefore, its management is becoming a serious problem. Hence, there is need of the eco-friendly disease management. Therefore, research on effect of organic amendments on the pathogen was carried out.

MATERIALS AND METHODS

The study was conducted in 2017-18 to test the effect of organic amendments against mycelia growth of the fungus using poisoned food technique. Organic amendments (FYM, vermicompost, cotton cake, mustard cake, neem cake and castor cake) were tested at 10, 20 and 30 per cent

concentrations. All the amendments were crushed to make fine powder. Fifty gram powder of each treatment was taken in to 250 ml flask and 150 ml sterilized water added in it and allowed it to decompose the material for 15 days. After 15 days, the materials were strained with muslin cloth to obtain extracts. The petri plates were poured with respective PDA containing extracts media and inoculated with 5 mm bit size of wilt pathogen from seven days old culture. The plates without extracts were served as control. Observations on radial growth were recorded after seven days.

RESULTS AND DISCUSSION

Results showed that all the six organic amendments caused significant reduction in mycelia growth as compared to control (Table .1). Neem cake proved most effective in reducing mycelia growth followed by mustard cake. Vermicompost was least effective followed by castor cake. Neem cake at 10, 20 and 30 per cent concentrations gave the maximum growth inhibition followed by mustard cake at 10, 20 and 30 per cent concentrations. Yelmame *et al.* (2010) observed least growth of the pathogen in the extract of neem cake showing excellent inhibitory followed by mustard cake against *Fusarium solani* of chilli under *in vitro* condition. Animisha *et al.* (2012) also observed that neem cake was found effective in maximum inhibition of *Fusarium oxysporum* f. sp. *ciceris*. Mahalakshmi and Yesuraja (2013) also found that neem cake showing excellent inhibitory effect followed by mahua cake against *Fusarium oxysporum* f. sp. *dianthi* under *in vitro* condition. Dhivya *et al.* (2017) recorded maximum per cent

reduction of mycelial growth with neem cake followed by mahua cake against *Fusarium oxysporum* f. sp. *lycopersici*.

CONCLUSION

All the organic amendments were found effective in inhibition of mycelia growth of *Fusarium oxysporum* f. sp. *lycopersici* over control. Neem cake proved most effective in reduction of mycelia growth followed by mustard cake and cotton cake at 30 per cent concentration. Vermicompost, FYM and castor cake were less effective.

REFERENCES

- Animisha, S.; Zacharia, K. K.; Jaiswal, T. N. and Pandey, P. (2012). Integrated management of chickpea wilt incited by *Fusarium oxysporum* f. sp. *ciceris*. *Int. J. Agril. Res.*, 7(5): 284-290.
- Dhivya, M.; Muthamilan, M.; Kalaivanan, R.; Devrajan, K. and Chinnaiah, C. (2017). Effect of oilcakes on the management of wilt disease of tomato caused by *Fusarium oxysporum* f. sp. *lycopersici*. *Int. J. Curr. Microbiol. Appl. Sci.*, 6(12): 2138-2140.
- Mahalakshmi, P. and Yesuraja, I. (2013). Efficacy of organic amendments on wilt of carnation caused by *Fusarium oxysporum* f. sp. *dianthi in vitro*. *Int. J. Plant Prot.*, 6(1): 59-61.
- Yelmame, M. G.; Mehta, B. P.; Deshmukh, A. J. and Patil, V. A. (2010). Evaluation of some organic extracts in *in vitro* to control *Fusarium solani* causing chilli wilt. *Int. J. Pharma Biosci.*, 1(2): 51.

Table 1: Effect of organic amendments on growth inhibition of *Fusarium oxysporum* in vitro condition

Sr. No.	Treatments	Growth Inhibition (%)			
		Concentrations (%)			
		10 (%)	20 (%)	30 (%)	Mean
1	FYM	26.20 (19.02)*	27.72 (21.18)	31.39 (26.67)	28.44 (22.29)
2	Vermicompost	18.51 (9.61)	21.15 (12.55)	22.60 (14.31)	20.75 (12.16)
3	Cotton cake	33.50 (30.00)	35.43 (33.14)	35.31 (32.94)	34.75 (32.02)
4	Mustard cake	33.25 (29.61)	35.19 (32.75)	36.14 (34.31)	34.86 (32.22)
5	Neem cake	31.01 (26.08)	36.49 (34.90)	38.12 (37.65)	35.21 (32.87)
6	Castor cake	25.18 (17.65)	26.90 (20.00)	32.26 (28.04)	28.12 (21.90)
Mean		27.94 (22.00)	30.48 (25.75)	32.64 (28.99)	
		T	C	T × C	
S. Em.±		0.34	0.24	0.59	
C. D. at 5 %		0.98	0.69	1.69	
C.V. %		3.37			

**Figures in parenthesis are retransformed values*