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Bio efficacy of fungicide against *Alternaria alternata* (Fr.) Keissler causal agent of tip blight of Tuberose

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Abstract
In vitro screening of nine fungicides by poison food technique at three concentrations revealed that Propiconazole (Tilt 25% EC), Hexaconazole (Contaf 5% EC) and Difenoconazole (Score 25% EC) were highly fungitoxic to *A. alternata* (Fr.) Keissler, the causal agent of leaf blight of tuberose.

Keywords: Fungicide, *Alternaria alternata*, Keissler causal, Tuberose

Introduction
Among the commercially grown flowers in India, tuberose (*Polianthes tuberosa* L.) occupies a prime position because of its popularity as cut-flower and loose flower. In India, the total area under tuberose cultivation is 1648 ha with total flower production of 13,184 MT (Patil, 2007) [7].

Tuberose is affected by several fungal, bacterial and viral diseases. The important fungal diseases; *Alternaria* leaf spot/leaf blight and stem rot diseases are the major constraints everywhere in production of the crop under south Gujarat conditions throughout the crop season causing serious losses. Practically no information on this problem is available. Hence looking at the seriousness of the disease and economic importance of this crop in this area, the present investigations were undertaken to study the disease and to generate information for suitable management measures to minimize crop losses.

Material and Method
To study bio-efficacy of different fungicides against *A. alternata* (Fr.) Keissler under laboratory condition, the poisoned food technique with PDA was employed (Nene and Thapliyal, 1993) [6]. Each fungicide was tested at three different concentrations calculated on the basis of active ingredients.

The fungicides were incorporated aseptically in the molten PDA in required quantities separately before pouring and shacked well for uniform dispersal of the fungicide. The medium was then poured in the petriplates and after solidification of medium the plates were aseptically inoculated by placing 5 mm diameter culture disc in the centre. The disk were cut from periphery of 9 days old pure culture of *A. alternata* (Fr.) Keissler grown on PDA. The plates were incubated at room temperature (27 ± 2 ^{0}C). Three repetitions of each treatment were maintained and the plates without fungicides were served as control. Observation on growth i.e. colony diameter as recorded and the percent growth inhibition over control was worked out by using the formula suggested Dennis and Webster (1971) [2].

Result and Discussion
Nine fungicides from systemic and non-systemic groups were evaluated at three different concentrations by poisoned food technique in vitro for their efficacy against *A. alternata* (Fr.) Keissler.

The results are presented in Table 1 and depicted in Fig 1 indicated that different fungicides have varied efficacy against *A. alternata* (Fr.) Keissler.

Table 1: Evaluation of different fungicides against *A. alternata* (Fr.)

Sr. No.	Technical and trade name of fungicide	Conc. (ppm)	Av. colony diameter (mm)	Percent growth inhibition over control (mm)
1	Propiconazole (Tilt 25% EC)	250	0.71*(0.00)**	100.00
		500	0.71(0.00)	100.00
		1000	0.71(0.00)	100.00
2	Hexaconazole (Contaf 5% EC)	250	2.49(5.71)	93.57
		500	0.71(0.00)	100.00
		1000	0.71(0.00)	100.00
3	Difenoconazole (Score 25% EC)	250	3.44(11.43)	87.23
		500	3.15(9.42)	89.37
		1000	3.02(8.6)	90.30
4	Tridemorph (Calixin 80% EC)	250	6.78(45.52)	48.66
		500	6.73(44.79)	49.49
		1000	6.68(44.12)	50.24
5	Propineb (Antracol 70% WP)	1000	8.09(64.89)	26.82
		1500	7.95(62.65)	29.35
		2000	7.91(62.08)	29.99
6	Carbendazim + Mancozeb (Sixer 75% WP)	250	8.63(73.92)	16.64
		500	8.37(69.50)	21.62
		1000	8.31(68.61)	22.63
7	Copper oxychloride (Blitox 50 % WP)	1000	9.35(86.99)	1.90
		1500	9.28(85.68)	3.38
		2000	9.21(84.36)	4.87
8	Mancozeb (Diathane-M 45-75% WP)	1000	8.79(76.71)	13.49
		1500	8.69(74.96)	15.47
		2000	8.63()74.04	16.50
9	Chlorothalonil (Kavach 75% WP)	1000	9.32(86.43)	2.53
		1500	8.67(74.73)	15.73
		2000	8.56(72.78)	17.92
10	Control		9.44	
	S.Em. ±	0.64		
	C.D. at 5%	1.82		
	C.V.%	2.27		

Note: ** = Figures in Paranthesis are retransformed values, * = Figures indicate SQR + 0.5 transformed values.

Cent percent inhibition of *A. alternata* (Fr.) Keissler was recorded with propiconazole (Tilt 25% EC) at all three concentrations tested and hexaconazole (Contaf 5% EC) at 500 and 1000ppm concentrations. The next best in order of efficacy was difenoconazole (Score 25% EC) at 1000 ppm (90.30%) and 500ppm (89.37%), tridemorph (Calixin 80% EC), propineb (Antracol 70% WP) were moderately effective while carbendazim + mancozeb (Sixer 75% WP), chlorothalonil (Kavach 75% WP), mancozeb (Diathane M-45 75% WP) and copper oxychloride (Blitox 50% WP) reported least effective in fungal growth inhibition as compared to other fungicides at all three concentrations tried.

It is evident from these results that the growth inhibition increased with an increase in the concentration of fungicides. Propiconazole (Tilt 25% EC) and hexaconazole (Contaf 5% EC) followed by difenoconazole (Score 25% EC) were significantly superior at all the three concentration over rest of the fungicides tested.

The results of Khan *et al.* (1995) [3] who reported propiconazole (Tilt 25% EC) as complete inhibitor of the growth of *A. alternata* (Fr.) Keissler and Murthy and Shenoy (2001) [5] who reported propiconazole (Tilt 25% EC), and hexaconazole (Contaf 5% EC) which were potent in inhibiting mycelial growth even at 100-ppm concentration.

Carbendazim (Bavistin 50% WP) was least effective in terms of inhibition of the radial mycelial growth against *A. solani* (Eu and Martin) reported by Mohammad (1988) [4]. Identical results were reported by Barnwal *et al.* (2002) [1] against *A. tenuissima* (Fr.) Wiltshire. These findings are in agreement with the results obtained in our present investigation.

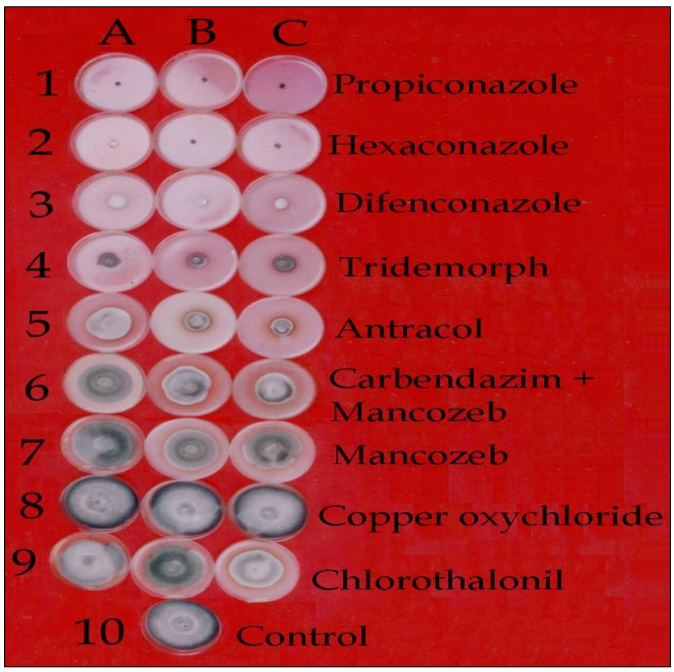

Fig 1: Evaluation of different fungicides against *A. alternate* (Fr.)

Conclusion

Nine fungicides at three different concentrations were screened *in vitro* by poisoned food technique to evaluate their efficacy against *A. alternata* (Fr.) Keissler. Among these fungicides, propiconazole (Tilt 25% EC) at all three concentrations and hexaconazole (Contaf 5% EC) at 500 and 1000 ppm were proved as most effective fungicide in suppressing growth and sporulation of *A. alternata* (Fr.) Keissler, the pathogen of leaf blight of tuberose as compared to the remaining fungicides. Next best in order of merit was difenoconazole (Score 25% EC) followed by tridemorph (Calixin 80% EC), while rest of the fungicide were found inefficacious.

Reference

1. Barnwal MK, Jha DK, Dubey SC. Evaluation of fungicides against Alternaria blight of marigold (*Tagetes* sp.). J Res. Birsa Agril. Univ. 2002; 14(1):99-100.
2. Dennis C, Webster J. Antagonistic Properties of species groups of *Trichoderma* III hyphal interaction. Trans. Brt. Mycol. Soc. 1971; 57:363-369.
3. Khan MA, Ahmod M, Saeed MA. Evaluation of fungicides on the growth *A. alternata in vitro* and the control of post harvest tomato fruit rot. Pakistan J Phytopath. 1995; 7(2):166-168.
4. Mohammed SE. Control of tomato early blight under plastic house conditions in Nivevali Prooince Iraq. Mesopatemia. J Agri. 1988; 20(2):359-366.
5. Murthy KK, Shenoi MM. Evaluation of various chemical fungicides against brown leaf spot disease of FCV Tobacco. Tobacco Research. 2001; 27(1):1-6.
6. Nene YL, Thapliyal PN. Fungicides in plant disease control. Oxford & IBH Publ. Pvt. Co. Ltd., New Delhi, Bombay and Calcutta, 1993, 351.
7. Patil VD. Floriculture an Emerging Industry in Maharashtra, Floriculture Today, 2007, 31.