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ADAPTABILITY OF *Macrophomina phaseolina* TO QUINTOZENE AND TMTD

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Macrophomina phaseolina from cowpea developed resistance to higher concentration of quintozene when serially transferred from media containing quintozone from lower to higher concentrations. On the contrary it did not show any resistance to TMTD. The inhibition by quintozene at 2000 ppm was 83.88, and 85.52 per cent when *M. phaseolina* was transferred from lower concentrations of 250, 500 and 1000 ppm respectively as against 91.13 per cent when transferred from control plates.

Failure of a fungicide to give considerable control of the disease after continuous use may be due to the development of resistance towards the fungicide (Georgopoulos and Zaracovitis, 1967; Fehrmann, 1976). The present paper deals with the *in vitro* adaptability of *Macrophomina phaseolina*, the incitant of root not of cowpea, for higher levels at fungicides.

MATERIALS AND METHODS

Fresh isolate of *M. phaseolina* was obtained from the diseased cowpea plants var. C 152. *in vitro* adaptability of the pathogen for higher levels of quintozene (Pentachloronitro benzene) and TMTD (Tetramethyl thiuram disulphide) was assessed by inhibition zone assay method. Inoculation was made by taking 8 mm discs of the fungus grown for 15 days on 250, 500 and 1000 ppm concentrations of quintozene to 2000 ppm of quintozene and on 1000 ppm of TMTD to 4000 ppm of TMTD. Suitable controls were maintained by transferring 8 mm discs of the fungus from 15 days old culture on PDA to 2000 ppm of quintozene and 4000 ppm of TMTD. After 3 days of incubation at 24± 2°C, observation were recorded in terms of colony diameter and per cent inhibition over control worked out.

RESULTS AND DISCUSSION

The results revealed that *M. phaseolina* developed resistance to higher concentrations of quintozene. On the contrary it did not develop any resistance to TMTD. The inhibition by quintozene at 2000 ppm was 83.88, 88.52 and 85.07 per cent when *M. phaseolina* was transferred from lower concentrations of 250, 500 and 1000 ppm respectively as against 91.13 per cent when transferred from control plates (Table 1).

Studies on *in vitro* adaptability of *M. phaseolina* to the fungicides revealed that the pathogen developed tolerance to higher concentrations of quintozene. Mathur *et al* (1971) also reported that *M. phaseolina* developed resistance to increasing concentra-

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Table : Growth measurement of *M. phaseolina* transferred successively from lower to higher concentrations of quintoznee and TMTD (per cent inhibition over control)

Sl No	Source of Inaculum	Fungicide	Day after Inoculation 1	2	3	mean
1	Quintozene 250 ppm	Quintozene 2000 ppm	90.03 (9.51)	84.01 (9.19)	77.61 (8.83)	83.88 (9.18)
2	Quintozene 500 ppm	,,	92.39 (9.64)	89.82 (9 50)	83.83 (9.16)	88.52 (9.53)
3	Quintozene 1000 ppm	,,	88 46 (9.43)	80.25 (9.31)	80.49 (9.00)	85.07 (9.25)
4	Control	,,	9169 (9.75)	92.92 (9.61)	85.77 (9.29)	91.13 (9.57)
5	TMTD 1000 ppm	TMTD 4000 ppm	100.00 (10.02)	100.00 (10.02)	100.00 (10 02)	100.00 (14.02)
6	Control		100.00 (10.02)	100 00 (10.02)	100.00 (10-02)	100.00 (10.02)
	Mean		91 26 (9.73)	92.17 (9.62)	87.86 (9.39)	

Figures in parentheses represent transformed values

Comparison of significant effects :

		S. E.	C. D. P=0.05
Days	—	0.03	0.09
Pesticides	—	0.04	0.13
Days add pesticides	—	0.08	0.22

tions of quintozene and carboxin when successively transferred after growth in lower contrations. Similar observations on adaptation to various protectant funguicdes have been reported by Reddy and Apparao (1970) in *Gloeosporium ampelophagum* Mackenzie *et al.* (1971) in *Cochliobolus carbonums* and Abelentsen (1973) in *Botrytis-cinerea* and Anilkumar (1976) in *Selerotium rolfsii.*

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