

Screening of eggplant cultivars for resistance to *Phomopsis*-Leaf blight under natural epiphytotics

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Out of 15 eggplant cultivars screened not a single one appeared immune to the disease. Nevertheless, the cultivars differed in their susceptibilities to *Phomopsis*-leaf blight. The non-descriptive local cultivar with tall spreading growth habit, with or without large spines on the stem, leaves and calyx, variable fruit colour predominantly green to purple and low yield potential showed higher level of tolerance to *Phomopsis*-leaf blight than the commercial high yielding cultivars. The differentiation in tolerance levels by the cultivars could be exploited in breeding programme for disease resistance.

Key words : *Phomopsis vexans*, eggplant, resistance, natural epiphytotics

INTRODUCTION

There is a continuing emphasis on crop breeding programmes in "improving resistance" towards disease. Numerous varieties have been released as disease resistant but only a few remain resistant for long due to development of new races with different parasitic capabilities to which resistant varieties produced often do not have a defence. In the present investigation 15 cultivars of eggplant were screened for their performance against *Phomopsis*-leaf blight under natural epiphytotics for two consecutive years, 1993 and 1994.

MATERIALS AND METHODS

Seedlings of 15 eggplant cultivars viz. BR-112, 17-B, HH-3, Kalo Soila, Karimpur local, Madanpur local, Makra, Manjari Gota, Muktakeshi, Nadia local, Nischindapur local, Pusa kranti, Pusa Purple cluster, Pusa Purple long and Uttara were planted in the experimental farm, B.C.K.V. during May 1993 and 1994. The cultivars were spaced 1.5 m apart and each cultivar was planted in two rows with 1 m x 60 cm spacing. The usual agronomical practices were followed during the experimental cultivation in field. The disease reaction expressed as severity of leaf blight due to *Phomopsis vexans* under natural epiphytotics were scored on a 5 point (0-5) scale over a period of 4 months (Islam, 1990) at monthly interval.

Where, 0 = no infection, 1 = upto 1% leaf area covered, 2 = 1 - 10% leaf area covered, 3 = 10-25% leaf area covered, 4 = 25-50% leaf area covered and 5 = more than 50% leaf area covered

The per cent disease index was calculated from the formula :

$$\frac{\text{Sum of all disease ratings}}{\text{Total number of ratings} \times \text{Maximum disease grade}}$$

RESULTS AND DISCUSSION

All eggplant cultivars screened showed *P. vexans* blighted leaves but the cultivars differed in their response to infection by the pathogen (Table 1). The percent disease severity in 1993 ranged from 2.80 - 16.14. In the next year, 1994, the level of disease was higher (5.29-23.77%) presumably due to presence of conducive weather conditions. Examination of weather factors from June to September for both the years revealed that the meteorological parameters were more favourable for the disease to occur in 1994 than 1993 (Table 2).

Table 1. Response of different eggplant cultivars to Phomopsis leaf blight under natural epiphytotics

Eggplant cultivars	Disease severity (%)		Pooled analysis
	1993	1994	
BR - 112	11.96 (20.14)	16.06 (23.59)	14.01 (21.93)
17 - B	12.47 (20.67)	18.21 (25.25)	15.34 (23.05)
HH - 3	13.63 (21.63)	19.88 (26.44)	16.75 (24.14)
Kalo Soila	3.58 (10.90)	6.58 (14.83)	5.08 (13.00)
Karimpur local	3.40 (10.59)	6.21 (14.42)	4.30 (12.60)
Madanpur local	3.10 (10.03)	5.96 (14.08)	4.53 (12.27)
Makra	9.58 (18.01)	13.40 (21.44)	11.49 (19.78)
Manjari Gota	8.43 (16.88)	11.03 (19.30)	9.73 (18.12)
Muktakeshi	9.18 (17.61)	13.29 (21.30)	11.23 (19.56)
Nadia local	4.00 (11.43)	8.24 (16.64)	6.11 (14.29)
Nischindapur local	2.80 (9.58)	5.29 (13.26)	4.04 (11.58)
Pusa kranti	11.32 (19.03)	15.77 (23.38)	13.54 (21.57)
Pusa Purple Cluster	16.14 (23.68)	23.77 (29.17)	19.95 (26.52)
Pusa Purple long	13.84 (21.83)	20.62 (26.99)	17.23 (24.52)
Uttara	3.88 (11.26)	7.62 (15.93)	5.75 (13.81)
S.Em. (±)	0.61	0.73	1.87
C.D. (P = 0.05)	1.77	2.12	5.40

Figures in the parenthesis are angular transformation values corresponding to percentage.

From the pooled data of disease severity the cultivars fell into 3 different groups of response (tolerance to susceptibility) as follows : Group 1 (tolerant) : Nischindapur local, Madanpur local, Kalo Soila, Uttara, Nadia local; Group 2 (moderately susceptible) : Manjari Gota, Muktakeshi, Makra, Pusa kranti, BR-112, 17-B, HH-3, Pusa Purple long and Group 3 (susceptible) : Pusa Purple Cluster.

Table 2. Environmental parameters during June to September of 1993 and 1994

Months	1993			1994		
	Av. maximum temperature (°C)	Av. minimum temperature (°C)	Number of rainy day	Av. maximum temperature (°C)	Av. minimum temperature (°C)	Number of rainy day
June	35.05	26.79	9	33.28	27.04	16
July	32.67	26.45	21	32.40	27.31	24
August	32.95	27.28	16	32.15	27.49	15
September	33.04	27.70	9	32.65	27.07	14

Several eggplant cultivars belonging to the 'Pengan' and 'Bengal' strains from India were found to be highly resistant to *Phomopsis*-blight (Howard and Desrosiers, 1941). Two *Phomopsis* resistant cultivars "Florida Market" and "Florida Beauty" were evolved and released in U.S.A. from crosses of the susceptible "Fort Myers Market" and "Black Beauty" with the resistant Indian cultivars respectively. In India Kalda *et al.* (1976) identified three lines 11a, 26b and 238 as highly resistant to the disease. In further studies resistance to *Phomopsis*-blight was found to be recessive and governed by polygenes. The major genes were more pronounced than additive ones in most of the crosses (Kalda *et al.*, 1977). Chowdhury and Hasija (1979) recorded minimum percentage of rotting in Pusa dwarf and Annamali respectively. The cultivars like Banpur local, Midnapur local, Barasat local, S-505 and S-541 from West Bengal gave highly resistant reaction to the disease (Das, 1985).

In the present study the non-descript local cultivars with tall spreading growth habit, with or without large spines on the leaves, stem and calyxes of the fruit, with variable fruit colour predominantly green to purple and low yield potential showed higher level of tolerance than the recognised high yielding ones. This unique differentiation of tolerance among the eggplant cultivars/lines tested may be suitably exploited for incorporation of resistance into cultivars with high yield potential but susceptible to the disease.

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