

## EVALUATION OF MUNGBEAN CULTURES AGAINST MYMV IN KARNATAKA UNDER NATURAL CONDITIONS

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### ABSTRACT

A large number of genotypes including some germplasm, breeding lines in F<sub>1</sub> and F<sub>2</sub> generations and some released varieties were evaluated against yellow mosaic virus disease of mungbean during rabi summer of 2004 and 2005. The results indicated that two genotypes GG-89 and GG-39 appeared to be immune with no disease incidence during 2004. The genotypes, TM-98-50, TM-97-55 and Co-5 showed resistant reaction against MYMV with disease incidence of 0.97, 0.87 and 0.58 percent during rabi summer 2005. Genotypes which showed resistant reaction could be used in MYMV disease resistant breeding programme after their confirmation.

**Key words :** MYMV, Screening, *Vigna radiata*, Resistance.

### INTRODUCTION

Mungbean (*Vigna radiata* L. Wilczek) is one of the important *kharif* pulses and is widely grown in summer and rainy seasons in several states of India. Among several constraints for mungbean production, mungbean yellow mosaic virus disease occupies prime position incurring heavy losses. Nariani (1960) first noticed the virus at IARI, New Delhi and he reported an incidence of 20-30% at institute areas. Among various management practices known, identifying resistant genotypes is the cheapest and best possible solution to manage virus disease problems. Therefore, a large number of genotypes of green gram available in Karnataka were evaluated against MYMV disease.

### MATERIAL AND METHODS

Field experiments were conducted during *rabi* summer, 2004 and *rabi* summer, 2005 under irrigated conditions at the Main Agricultural Research Station, Dharwad. A total of 93 genotypes including different generations of various crosses during *rabi* summer 2004 and 25 genotypes during *rabi* summer 2005 collected from MULLaRP, Main Agricultural Research Station, Dharwad were planted in 2 rows of 5 meter each with "Chinamung" as susceptible check after every 5 test entries. Per

cent disease incidence was calculated by using the following formula.

$$\text{Per cent disease incidence} = \frac{\text{Number of plants infected in a row}}{\text{Total number of plants in a row}} \times 100$$

The genotypes were later grouped into different categories based on 0 to 9 scale (Mayee and Datar, 1986).

Scale	Description	Category
0	No plants showing any symptoms	Immune
1	1% or less plants exhibiting symptoms	Resistant
3	1-10 % plants exhibiting symptoms	Moderately Resistant
5	11-20% plants exhibiting symptoms	Moderately susceptible
7	21-50% plants exhibiting symptoms	Susceptible
9	51% and more plants exhibiting symptoms	Highly susceptible

### RESULTS AND DISCUSSION

The disease incidence varied from 0.00 to 100.0 per cent during *rabi* summer 2004 and 0.58 to 75.8 per cent during *rabi* summer 2005 in various

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**Table 1.** Reaction of mungbean genotypes against MYMV during *rabi* summer 2004 (January - April).

Genotype/ cross	PDI at pre flowering stage	Grade	Genotype/ cross	PDI at pre flowering stage	Grade
GG-89	0.00	I	GG-39	0.00	I
F <sub>1</sub> TAP-7 x DLGG-57	5.88	MR	F <sub>1</sub> TAP-7 x 96-1	6.80	MR
F <sub>1</sub> TAP-7 x GG-70	4.30		F <sub>3</sub> DLGG-1 x DLGG-16	7.5	
GG-99	2.7		GG-87	6.25	
OUM-7	6.6				
DLGG-15	7.4				
AKM-9601	16.6	MS	GG-86	10.8	MS
GG-82	11.1		M-1	15.0	
M-1	11.6		GG-101	20.6	
GG-79	11.1		DLGG-6	12.19	
Chinamung x 96-2	30.0	S	F <sub>4</sub> Pusa Baisakhi x DLGG-1	34.0	S
F <sub>1</sub> TAP-7 x GG-51	21.4		TAP-7	31.9	
F <sub>1</sub> TAP-7 x DLGG-1	22.20		AKM-9801	35.7	
F <sub>2</sub> TAP-7 x Chinamung	25.0		TM-98-58	47.6	
F <sub>2</sub> TAP-7 x DLGG-1	31.8		TM-98-47	34.6	
F <sub>2</sub> DLGG-16 x Chinamung	37.7		F <sub>3</sub> BB x Pusa 9531	38.0	
F <sub>2</sub> DLGG-16 x DLGG-1	26.8		F <sub>3</sub> KM 162 x DLGG-2	50.0	
F <sub>2</sub> Pusa baisakhi x 96-2	50.0		GG-45	50.0	
F <sub>2</sub> UK-1	21.8		GG-28	45.8	
F <sub>3</sub> M-1x DLGG-1	47.0		OUM-11-5	30.0	
MH-98-1	48.1		GG-46	37.0	
ML-881	45.4		GG-51	29.0	
GG-49	42.3		BPMR-1	37.9	
F <sub>3</sub> DLGG-11 x DLGG-1	44.8		GG-74	47.6	
F <sub>3</sub> NB x BDYR-1	34.7		GG-94	33.3	
F <sub>3</sub> BG x BDYR-1	22.2		DLGG-9	28.0	
F <sub>3</sub> M-1 x DLGG-16	48.7				
ML-936	95.6	HS	UPM-99-3	55.5	HS
F <sub>4</sub> SEL-4 x DLGG-2	63.0		NDM-97-1	75.0	
F <sub>2</sub> DLGG-16 x Chinamung	100.0		RMG-511	70.8	
F <sub>2</sub> DLGG-5 x DLGG-16	60.0		VGG-72	83.3	
DLGG-1	56.0		KGG-96034	85.7	
F <sub>3</sub> DLGG-17x DLGG-1	62.5		VMGG-97001	66.6	
F <sub>3</sub> NB x Pusa Bold-2	55.5		GG-9	82.3	
KM-2194	71.4		GM-9610	73.0	
IPM-99-125	73.3		OBGG-11	89.6	
DLGG-3	100.0		CZM-1	64.0	
chinamung	63.3		DLGG-10	53.57	
GG-18	63.6		GG-109	52.0	
GG-22	77.7		OUM-11-2	54.7	
GG-33	68.18		ML-1108	55.1	
GG-50	100.0		DLGG-1	69.2	
GG-40	57.6		DLGG-13	58.8	
GG-52	76.4		GG-54	83.3	
GG-58	66.6		ML-131	72.2	
GG-59	76.4		GG-53	100.0	
GG-67	70		GG-113	54.2	
GG-8	60.8		MH-96-1	65.5	

genotypes. Two genotypes GG-89 and GG-39 showed immune reaction under field condition, there could be disease escapes and need further confirmation. The  $F_1$  generation of TAP-7 x DLGG-57, TAP-7 x 96-1,  $F_3$  generation of DLGG-1 x DLGG-16 and the genotypes GG-99, GG-87, OUM-7 and DLGG-15 showed moderately resistant reaction with disease incidences of 5.88, 6.80, 7.50, 2.70, 6.25, 6.60 and 7.40 per cent during *rabi* summer 2004 (Table 1). The genotypes TM-98-50, TM-97-55 and Co-5 were found resistant with only < 1.0 per cent disease incidence during *rabi* summer 2005. GMBL-2, OBGG-52 and ML-5 were found moderately resistant with disease incidences of 8.80, 6.80 and 3.80 percent (Table 2). Earlier, Pandya *et al.*, (1977) screened 248 lines of mungbean under natural field condition against yellow mosaic virus and the genotype Tarai Local was found resistant. Chhabra *et al.*, (1978) found ML 1 and ML 3 as resistant against whitefly and yellow mosaic incidence under field screening. Similarly, Asthana (1998) found PDM-11, PDM-54, PDM-84-143 varieties resistant to yellow mosaic and recommended for use in disease resistance breeding

programmes. Manivannan *et al.*, (2001) found green gram germplasm, EC 30072, K 141, LGG 424B and LM 108B resistant to yellow mosaic and recommended for incorporation in resistant breeding programme. Ganapathy *et al.*, (2003) from NPRC, Vamban, Tamil Nadu reported that RU 2229, VBG 86, 2 KU 54, VBG 89, SU 16 were highly resistant to MYMV. Pathak and Jhamaria (2004) reported that ML-5 and MUM-2 were resistant against MYMV with only 2.22 and 3.12 percent infection as against cent per cent infection in K-851, a check cultivar. When scored according to Mayee and Datar (1986), most of the genotypes showed susceptible and highly susceptible reaction. Such a susceptible or resistant reaction was attributed to the genes present in the respective genotypes (Nagaraj *et al.*, 1981). Chinamung, the mung variety popularly grown all over Karnataka was found highly susceptible during 2004 and susceptible in the following year of screening with disease incidence of 63.3 and 48.5 per cent respectively. The genotypes grouped under resistant category may be used in MYMV resistance breeding programme and can be viewed as alternatives to Chinamung in Karnataka.

**Table 2.** Reaction of mungbean genotypes against MYMV during *rabi* summer 2005 (January-April).

Genotype/ cross	PDI at pre flowering stage	Grade	Genotype/ cross	PDI at pre flowering stage	Grade
TM-98-50	0.97	R	Co-5	0.58	R
TM-97-55	0.87				
GMBL-2	8.80	MR	OBGG-52	6.80	MR
PS-16	4.80		ML-5	3.80	
SIT-4	12.8	MS	BPMR-1	16.5	MS
TAP-7	32.8	S	DGS-5	35.7	S
BPMR-145	35.8		Pusa-9531	41.5	
Vaibhav	43.8		PD-51	32.7	
DLGG-11	32.5		Pusabaisakhi	37.7	
2KM-130	44.8		Chinamung	48.5	
PDM-143	46.3		DPV-8831	41.2	
GG-57	38.8				
DGS-1	63.6	HS	OUM-11-5	75.8	HS
DLGG-22	55.5				

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