SCREENING OF URDBEAN GERMPLASM AGAINST YELLOW MOSAIC AND LEAF CRINKLE VIRUS DISEASES

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Screening of thirty two test lines of mungbean against yellow mosaic virus (MBYMV) and urdbean leaf crinkle virus (UBLCV) diseases revealed that only three cultivars i.e. S 118, S 132 and S 136 were moderately resistant to MBYMV while the rest of the cultivars were moderately susceptible to highly susceptible. In screening studies against UBLCV disease two cultivars viz. S 332 and S 539 were found to be highly resistant, eight resistant, thirteen moderately resistant and seven moderately susceptible, cultivar S 433 being susceptible and cultivar S 275 highly susceptible.

INTRODUCTION

Urdbean (*Vigna mungo* (L) Hepper) is an important pulse crop of Pakistan but its yield (460 kg/ha) is extremely low (Anonymous, 1980). Among the factors responsible for its low yield, MBYMV (Ahmad, 1975) and UBLCV diseases are of foremost importance (Bashir and Zubair, 1985). The MBYMV is transmitted through an insect vector, *Bemisia tabaci* (Ahmad and Harwood, 1973) while UBLCV is transmitted through seed (Beniwal *et al.*, 1983) and vectors like *Aphid craccivora*, *Aphid gossypi* (Dhingra, 1976) and *Bemisia tabaci* (Narayanasamy and Jaganathan, 1973).

Since the cheapest and ideal way of controlling plant diseases is the use of resistant cultivars, so efforts were directed to screen some lines under natural infection conditions against MBYMV and UBLCV diseases.

MATERIALS AND METHODS

The experiment included two disease screening nurseries, one against MBYMV and the other against UBLCV. Each nursery included thirty two different test lines, obtained from Directorate of Pulses, Ayub Agricultural Research Institute, Faisalabad. The lines were planted in a double row sub-plot having row length 4m, row spacing 30 cm and plant to plant distance 10 cm. A row of susceptible local check was planted after every two rows to serve as spreader. The entries were subjected to natural invasion and build up of the vectors of MBYMV and UBLCV and consequently to the infection of urdbean plants by respective disease. The disease on each of the test entries was assessed by recording its incidence (% plant infection) 45 days after germination. The level of resistance/ susceptibility of each test line was determined by using the disease rating scale designed by Ilyas *et al.* (1992).

RESULTS AND DISCUSSION

In case of screening against MBYMV (Table 1), none of the cultivars was found to be resistant. However, cultivars S 118, S 132 and S 136 behaved as moderately resistant. Cultivar S 10 was moderately susceptible, three were susceptible and remaining were highly susceptible. This shows that different cultivars/ lines vary in their genetic response to MBYMV and suggests that resistance may be controlled by different genes/or gene combination in this

Table 1. **Reaction of urdbean germplasm against mungbean yellow mosaic virus disease**

Disease rating scale	Cultivar	Diseease reaction (%)
0.	–	Immune
1.	–	Highly resistant
2.	–	Resistant
3.	S–118,S–132,S–136	Moderately resistant
4.	S–10	Moderately susceptible
5.	S–156,M80,33–40	Susceptible
6.	S–175,S–210,S–234,S–239,S–242, S–250,S–275,S–290,S–291,S–297, S–300,S–326,S–332,S–338,S–341, S–381,S–426,S–433,S–536,S–539, S–564, 5–60,49–6,6–4,12–24.	Highly susceptible

case. Dwivedi and Singh (1986) suggested that resistance to MBYMV disease was controlled by two independent recessive genes, while Khausal and Singh (1988) were of the view that resistance was monogenically controlled. In varietal screening studies in Pakistan by Ahmad (1975), 17 out of 96 exotic and 8 out of the 20 indigenous urdbean types were found to be highly resistant to MBYMV and 50% of the total material was fairly tolerant. A good number of resistant sources for MBYMV have been located in urdbean by Nene (1973).

Out of thirty two cultivars evaluated for their reaction to UBLCV (Table 2), S 332 and S 539 were found to be highly resistant, eight resistant, thirteen moderately resistant and seven moderately susceptible. Cultivars S 433 and S 275 behaved as susceptible and highly

Table 2. **Reaction of urdbean germplasm against urdben leaf crinkle virus disease.**

Disease rating scale	Cultivar	Diseease reaction (%)
0.	–	Immune
1.	S–332, S–539	Highly resistant
2.	S–118,S–132,S–136,S–156,S–175, S–210,S–234,S–291	Resistant
3.	S–10,S–239,S–242,S–250,S–297, S–303,S–326,S–338,S–564,M–80, 12–24,33–40,MM–510	Moderately resistant
4.	S–290,S–341,S–381,S–426,S–530, 49–6,6–4,	Moderately susceptible
5.	S–433,	Susceptible
6.	S–275.	Highly susceptible

susceptible, respectively. Iqbal *et al.* (1991) while studying the reaction of urdbean cultivars against UBLCV have reported that out of the nineteen genotypes screened against UBLCV disease, only four were found resistant while other showed average reaction to leaf crinkle disease. From these urdbean germplasm screening studies against MBYMV and UBLCV, it is concluded that resistance against the two viruses is not scarce in the germplasm and that this resistance could further be exploited for the production of resistant commercial cultivars of urdbean.

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