SCREENING OF DIFFERENT GENOTYPES OF OKRA AGAINST YELLOW VEIN MOSAIC VIRUS UNDER FIELD CONDITION

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ABSTRACT

Sixteen genotypes of okra (Abelmoschus esculentas L. Moench) were evaluated to determine their responses to okra yellow vein mosaic virus (YVMV) in a field trial at Vegetable Research Station, Junagadh Agricultural University, Junagadh during summer 2011. The results revealed that none of the genotypes was found completely free (immune) to YVMV incidence. However, two genotypes, (JOL-08-5 and AOL-08-2) was highly resistant, while one genotype (JOL-07-12-15) was moderate resistant and 7 genotypes (JOL-7-K-3, JOL-07K-13, AOL-05-1, JOL-63-K-5, JOL-07-16, JOL-07-K16 and JOL-09-8) were tolerance against YVMV. GO-2 was moderate susceptible, Selection-2, GJO-3, AOL-07-8 and AOL-08-10 were susceptible, while the remaining all the genotypes showed highly susceptible reaction.

KEY WORDS: Immune, okra, resistant, susceptible, tolerance, YVMV

INTRODUCTION

Okra (*Abelmoschus esculentus* L. Moench) commonly known as bhendi or lady's finger belongs to the Malvaceae family and is an important vegetable crop grown across different states of the country throughout the year. Among the different species of genus, *Abelmoschus*, the most popularly grown species is *Abelmoschus esculentus* in tropical and sub-tropical regions of the world and has great commercial demand due to its nutritional value. The major production constraint for okra is yellow vein mosaic disease, causing losses with regard to the quality and as well as the yield wherever the crop is grown. In India, the extent of loss due to YVMD has been estimated to be as high as 85 to 96 per cent.

Okra Yellow Vein Mosaic Virus transmitted by white fly (*Bemisia tabaci* Gen.) is the most serious disease of okra (Ali et al., 2000; Ghanem, 2003; Fajinmi and Fajinmi, 2010). Infection of 100 per cent plants in a field is very usual and yield loss ranges between 50 and 94 per cent depending on the stage of crop growth at which infection occurs (Sastry and Singh, 1974). If plants are infected within 20 days after germination, their growth is retarded; few leaves and fruits are formed and loss may be reach up to 94 per cent (Sastry and Singh, 1974). The extent of damage declines with delay in infection of the pathogens. Plants infected 50 and 65 days after germination suffer a loss of 84 and 49 per cent, respectively (Sastry and Singh, 1974; Ali *et al*., 2005b). Keeping this in view, 26

genotypes of okra were screened against YVMV under field conditions.

MATERIALS AND METHODS

Sixteen genotypes of okra (*Abelmoschus esculentas* L. Moench) were evaluated to determine their responses to okra yellow vein mosaic virus (YVMV) in a field trial at Vegetable Research Station, Junagadh Agricultural University, Junagadh during summer 2011. The experiment was grown in Randomized Block Design replicated twice in a single row plot of 5 m length keeping 25 cm distance between two plants. Fifty days after planting, the number of okra plant counted showing yellow vein mosaic virus present on 10 randomly chosen plants per plot. Counting was done early in the morning between 7 and 10 am. The disease on each test entry was assessed in according to Prakasha *et al*. (2010), following self made disease rating scale by Ali et al. (2005a, b) (Table 1).

RESULTS AND DISCUSSION

Based on disease rating scale, the data presented in Table 2 of screening of 26 different genotype of okra against YVMV under field condition revealed that out of 26 genotypes tested, none of the genotypes was found completely free (immune) to YVMV incidence. Similar results were also reported by Benchasri (2011) and Venkataravanappa *et al*. (2013). Two genotypes, (JOL-08-5 and AOL-08-2) was highly resistant, while one genotype (JOL-07-12-15) was moderate resistant and 7 genotypes (JOL-7-K-3, JOL-07K-13, AOL-05-1, JOL-63-K-5, JOL-07-16, JOL-07-K16 and JOL-09-8) were tolerance against YVMV. GO-2 was moderate susceptible, Selection-2, GJO-3, AOL-07-8 and AOL-08-10 were susceptible, while the remaining all the genotypes showed highly susceptible reaction. The genotypes Arka Anamika and Pusa Savani earlier showed to be resistance to BYVMV (Borah *et al*., 1992), were highly susceptible with much faster development of disease symptoms than other tested genotype (Venkataravanappa *et al*., 2013). The variation in symptoms observed in various genotypes may be due to unique interaction between the particular virus strain and plant genotype or vector and genotype or altered feeding conditions of the vector (Polston and Anderson, 1997; Delatte *et al*., 2006; Azizi *et al*., 2008; Venkataravanappa *et al*., 2013). Chaudhury *et al*. (1992) has reported the incidence of yellow vein mosaic virus in okra. In case of hybrids disease incidence ranged between 19.26 and 69.13 per cent, whereas on parent plants, it ranged from 19.95 to 51.16 per cent. Batra and Singh (2000) screened eight okra varieties against OYVMV, Okra No.6, LORM-1, VRO-3 and P-7 were found free from disease whereas VRO-4 showed mild reaction. Arora *et al.* (1992) evaluated 157 advanced germplasm and 7 cultivars/hybrids of okra for two years and observed that Punjab, Padmini and EMS-8 remained free from the OYVMV. Sharma *et al*. (1993) reported that Punjab, Padmini and Punjab-7 varieties of okra were found high yielding and resistant to OYVMV. Ali *et al*. (2005b) reported Safal, Subz Pari and Surkh Bhindi varieties against OYVMV in a field trial (3.36-24.40%). Benchasri (2011) graded KN – OYV – 25, PC 52S5, KN – OYV - 01, KN - OYV - 02, KN - OYV - 13, KN - OYV - 04, KN - OYV - 11, NO 71 and KN - OYV - 16 showed 32.26, 35.48, 36.36, 38.71, 38.71, 40.63, 40.63, 40.63 and 41.94 per cent OYVMV infection, respectively as tolerant genotypes. TVRC 064 and KN - OYV - 14 were moderate susceptible, Luck file 473 and PJ. 03 were slight susceptible, and OP was highly susceptible to OYVMV. Venkataravanappa *et al*. (2013) reported that genotypes Nun 1145 and Nun 1144 showed moderate resistance and genotypes M10, Nun 1142, Nun 1140 showed moderately

susceptible reactions under both glass house and field conditions.

CONCLUSION

Based on results, none of the genotypes was found completely free (immune) to YVMV incidence. However, two genotypes, (JOL-08-5 and AOL-08-2) was highly resistant, while one genotype (JOL-07-12-15) was moderate resistant and 7 genotypes (JOL-7-K-3, JOL-07K-13, AOL-05-1, JOL-63-K-5, JOL-07-16, JOL-07-K16 and JOL-09-8) were tolerance against YVMV. GO-2 was moderate susceptible, Selection-2, GJO-3, AOL-07-8 and AOL-08-10 were susceptible, while the remaining all the genotypes showed highly susceptible reaction.

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Table 1: Disease rating scale of OYVMV

Rating Scale	Severity Range (%)
0 Immune	0 %
1 Highly resistant	1-10 %
2 Moderate resistant	11-25 %
3 Tolerant	26-50 %
4 Moderate susceptibility	51-60 %
5 Susceptibility	61-70 %
6 High susceptibility	71-100 %

Source: Ali et al (2005a, b)

Table 2: Response of different genotypes of okra against YVMV incidence under field condition

Rating Scale	Name of Genotypes with Per Cent Incidence	Reaction or Level of Resistance
0 %	Nil	Immune
1-10 %	JOL-08-5 (1.8%) and AOL-08-2 (2.4%)	Highly resistant
11- 25 %	JOL-07-12-15 (20.00 %)	Moderate resistant
26-50 %	JOL-7-K-3 (28.6%), JOL-07K-13 (40.00%), AOL-05-1 (41.6%), JOL-63-K-5 (45.8%), JOL-07-16 (46.2%), JOL-07-K16 (46.2) and JOL-09-8 (46.9%)	Tolerant
51-60 %	GO-2 (60%)	Moderate susceptibility
61-70 %	Selection-2 (63.6%), GJO-3 (66.7%), AOL-07-8 (67.0%) and AOL-08-10 (68.4%)	Susceptibility
71-100 %	URO-6 (72.4%), JOL-09-7 (79.3%), GHO-2 (80%), JOL-09-5 (86.2%), JOL-5-3Su (84.2%), JOL-07K-1 (87.5%) , Pusa Savani (87.5%), AOL-09-13 (88.2%), JOL-5k-1(88.8%), JOL-07-K-12 (92.8%) and JOL-07-K-11 (95.8%)	High susceptibility

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