

Performance of okra in relation to yellow vein mosaic virus in different seasons

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SUMMARY

Forty-one okra genotypes were evaluated in *Kharif*, *Rabi* and summer season against yellow vein mosaic virus. Among 41 genotypes evaluated 18 genotypes in *Kharif*, 35 genotypes in *Rabi* and all forty-one genotypes were found to be highly resistant during summer. 7 cultivars in *Kharif* and 2 in *Rabi* showed resistant reaction. 6 cultivars in *Kharif* and 3 in *Rabi* found to be moderately resistant. Moderately susceptible reaction was shown by 4 cultivars in *Kharif* and only 1 cultivar in *Rabi* season. 4 cultivars shown susceptible reaction in *Kharif* while none was found to be susceptible in *Rabi* season. Local long and Pusa sawani (check) found to be highly susceptible in *Kharif* season. None was found to be highly susceptible in *Rabi* season. There was no record of disease incidence in summer season that might be due to non-availability of vectors and environmental conditions, prevailed during summer season.

Key words : Okra, Evaluation, YVMV

Okra [*Abelmoschus esculentus* (L.) Moench] known as Bhindi is an important vegetable crop of India and other sub-tropical and tropical countries of the world. This crop is attacked by a number of diseases and Yellow Vein Mosaic Virus is the most serious and infects all plant parts including fruits. This virus has been reported to cause up to 94 per cent loss in yield (Sastry and Singh, 1974; Singh, 1985). No any economical control measure, except resistant varieties is known to manage this “Yellow plague” of okra. The spread of the disease depends upon the environmental conditions, crop characteristics and vector population (Singh, 1990; Sharma *et al.*, 1987). Since, there is a Variable reaction of virus to different okra genotypes under different agro climatic conditions, so it was considered imperative to assess the different varieties and lines under different seasons to find out durable resistant genotypes against this disease.

MATERIALS AND METHODS

The present investigation was conducted during *Kharif*, *Rabi* season of 2007-08 and summer season of 2008-09 at the Experimental Farm, Department of Genetics and Plant Breeding, Marathwada Agricultural University, Parbhani. 41 okra cultivars including different lines of Parbhani kranti cultivar having different sources with two checks were evaluated in three different seasons.

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The experiment was laid out in randomized block design with three replications. Each entry was sown accommodating 15 plants in 3 rows per replication of 4.2 m length at 60x30 cm spacing. Infected rows of pusa sawani, which is highly susceptible to YVMV were grown around the plot. The recommended cultural practices were followed to raise a successful crop. The crop was observed for the incidence of YVMV disease at 15 days interval commencing from 15th to 90th days after sowing. The disease incidence was recorded on the basis of the visual symptoms on the crop. The visual symptoms observed were vein and veinlet chlorosis, chlorotic spots appearing regularly in the interveinal region, thickened leaves etc.

The overall disease reaction was assigned according to a co-efficient of infection (Table 1). Co-efficient of infection (CI) was calculated by multiplying the per cent of disease intensity (PDI) by the response value assigned to each severity grade.

Table 1 : Scale for classifying disease reaction against yellow vein mosaic virus

Appearance of YVMV symptoms	Symptom	Response value	CI	Reaction
Absent	0	0	0-4	HR
<25% leaves (mild)	1	0.25	4.1-9.0	R
25-50% leaves	2	0.50	9.1-19	MR
51-75% leaves	3	0.75	19.1-39	MS
75-90% leaves	4	1.00	39.1-69	S
>90% leaves	5	1.00	69.1-100	HS

CI = Co-efficient of infection, HR = Highly resistant, R = Resistant
MR = Moderately resistant, MS = Moderately susceptible, S = Susceptible
HS = Highly susceptible

$$\text{PDI} = \frac{\text{Number of diseased plants}}{\text{Total no. of plants observed}} \times 100$$

RESULTS AND DISCUSSION

The results revealed that of the 41 cultivars evaluated eighteen genotypes were found to be highly resistant to YVMV during *Kharif*, *Rabi* as well as in summer season, these were Parbhani kranti (Vijay seeds), C-1, C-2, Parbhani kranti (open pollinated), Parbhani kranti (Sangali area), PB-236, VLH-105, AOH-04-3, Arya Dhanlaxmi, Barkha, Karishma, Parbhani kranti (Pankaj seeds), DSU-1, Parbhani kranti (Mahabeej), Parbhani kranti (Parli area), KS-442, AROH-218 and Parbhani kranti (check). While P-43 (Evergreen), PBN-OK-13, Medium long local, PBN-OK-11, KDOH-404, PBN-OK-2, PB-57, PBN-OK-5, Sardar bhendi, BSS-593, Akola Bahar, PBN-OK-8, MBORH-913, MBORH-311, JNDOH-02-2, P-7 and Pusa sawani (check) were found highly resistant during *Rabi* and summer seasons only. However, in summer all genotypes showed immune reaction to the YVMV.

In *Kharif* season P-43 (Evergreen), PBN-OK-11, KDOH-404, Sardar Bhendi, BSS-593, MBORH-913 and

JNDOH-02-2 cultivars showed resistant reaction while in *Rabi* PBN-OK-14 and Arka anamika (Vijay seeds) found to be resistant. Moderately resistant reaction was observed in six cultivars, *viz.*, PBN-OK-13, Medium long local, PBN-OK-8, PB-57, PBN-OK-5, PBN-OK-8 and three cultivars *i.e.* Arka Anamika, PBN-OK-6 and Arka Abhay in *Kharif* and *Rabi* season, respectively.

Four genotypes were found to be moderately susceptible to the virus during *Kharif* they were PBN-OK-14, PBN-OK-6, Akola bahar and Arka Abhay. While in *Rabi* season Local long cultivar only found to be moderately susceptible.

It was found that four cultivars Arka Anamika, MBORH-311, P-7, and Arka Anamika (Vijay seeds) showed susceptible reaction to YVMV in *Kharif* while in *Rabi* there was no record of any cultivar to be susceptible.

Local long and pusa sawani (check) cultivars found to be highly susceptible in *Kharif* season, however, none of the cultivar was found to be highly susceptible during *Rabi* season. However, there was no record of disease in summer season on any genotype.

Table 2: Disease reaction against YVMV in okra genotypes during *Kharif*, *Rabi* and summer season

Reaction	Season	Genotypes
Highly resistant	<i>Kharif</i> (18)	Parbhani Kranti, C-1, C-2, Parbhani Kranti (Open pollinated), Parbhani kranti (Sangali area), PB-236, VLH-105, AOH-04-3, Arya Dhanlaxmi, Barkha, Karishma, Parbhani Kranti (Pankaj), DSU-1, Parbhani Kranti (Mahabeej), Parbhani Kranti (Parli), KS-442, AROH-218, Parbhani kranti. (c)
	<i>Rabi</i> (35)	Parbhani kranti (Vijay seeds, C-1, C-2, Parbhani kranti (open pollinated, Parbhani kranti (Sangali area, PB-236, P-43 (Ever green) , VLH-105, PBN-OK-13, AOH-04-3, Medium long local, Arya Dhanlaxmi, PBN-OK-11. Barkha, KDOH-404, PBN-OK-2, Karishma, PB-57, DSU-1, PBN-OK-5, Sardar bhendi, Parbhani kranti (Pankaj seeds), Parbhani kranti (Mahabeej), Parbhani kranti (Parli area), KS-442, AROH-218, BSS-593, Akola Bahar, PBN-OK-8, MBORH-913, MBORH-311, JNDOH-02-2, P-7, Parbhani kranti (check), Pusa Sawani (check)
	Summer (41)	All genotypes
Resistant	<i>Kharif</i> (7)	P-43, PBN-OK-11, KDOH-40, Sardar bhendi, BSS-593, MBORH-913, INDOH-02-2
	<i>Rabi</i> (2)	PBN-OK-14, Arka Anamika (Vijay seeds seeds)
	Summer (0)	Nil
Moderately resistant	<i>Kharif</i> (6)	PBN-OK-13, Medium long local, PBN-OK-8, PB-57, PBN-OK-5, PBN-OK-8
	<i>Rabi</i> (3)	Arka Anamika, PBN-OK-6, Arka Abhay
	Summer (0)	Nil
Moderately susceptible	<i>Kharif</i> (4)	PBN-OK-14, PBN-OK-6, Akola Bahar, Arka Abhay
	<i>Rabi</i> (1)	Local long
	Summer (0)	Nil
Susceptible	<i>Kharif</i> (4)	Arka Anamika, MBORH-311, P-7, Arka Anamika (Vijay seeds seeds)
	<i>Rabi</i> (0)	Nil
	Summer (0)	Nil
Highly susceptible	<i>Kharif</i> (2)	Local long, Pusa sawani (c)
	<i>Rabi</i> (0)	Nil
	Summer (0)	Nil

(Figures in the parenthesis indicates number of genotypes showing particular disease reaction in a season)

Thus from the present study it can be revealed that considerable variation is present in the material studied against YVMV disease in different seasons. The identified resistant lines can be further incorporated in the resistant breeding programmes against yellow vein mosaic virus.

The incidence of the disease in a particular genotype varied from season to season may be due to the fluctuation in the environmental conditions and vector population

dynamics during growing season.

There was no record of disease incidence in summer season that might be due to non availability of vectors and environmental conditions prevailed during summer season.

Similar kind of studies were reported by Prabu and Warade (2007), Singh *et al.* (2002), Neeraja *et al.* (2004) and Kousalya V. (2005).

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