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# Screening for resistance to yellow vein mosaic virus of okra (*Abelmoschus esculentus* (L.) Moench) genotypes under field condition

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## ABSTRACT

Thirty-five okra genotypes along with three checks were screened for resistance or susceptibility to yellow vein mosaic virus. Out of 35 test genotypes, twenty genotypes were found to be moderately susceptible to yellow vein mosaic virus, 10 genotypes found to be tolerant whereas five genotypes found to be susceptible and only one genotype showed highly susceptibility towards yellow vein mosaic virus. In this study none of the genotypes showed resistance or highly resistance reaction.

**Key words:** *Abelmoschus esculentus*, Genotypes, YVMV, Tolerant, Susceptible, Resistance

## Introduction

Okra (*Abelmoschus esculentus* L. Moench) is a major vegetable crop grown in India. Okra is one of the most significant vegetable crops cultivated in India throughout the summer and rainy seasons for its soft green fruits. Okra (*Abelmoschus esculentus* L. Moench) is most likely an amphidiploid (allotetraploid) with somatic chromosome number 130 and a member of the Malvaceae family. It is a crop that is often cross-pollinated. Out crossing occurs to a degree of 4 to 19 percent with insect aided pollination, with a high of 42.2 percent. Okra fruit is mostly consumed fresh or cooked. There are at least eight *Abelmoschus* species found in India, with only *A. esculentus* identified as a cultivated species and the others being true wild forms. The species resistant to Okra Yellow Vein Mosaic Virus (YVMV) are *Abelmoschus manihot*, *Abelmoschus caillei*, *Abelmoschus crinitus* and *Abelmoschus tetraphyllus*

The cultivation of okra in India is hampered by a high prevalence of YVMV, which causes symptoms of a homogeneous, interconnected network of yellow veins encircling islands of green tissues. There is a decrease in leaf chlorophyll, and diseased plants seem stunted and produce little pale-yellow fruits (Gupta and Paul, 2001). This Begomovirus is a member of the Geminiviridae family, which includes numerous crop viruses. The reported output losses owing to YVMV vary from 50 to 94 percent (Sastry and Singh, 1974). Unfortunately, many of the currently available okra types are susceptible to YVMV. At the time of the virus's emergence, some cultivable types showed tolerance or resistance to it, but this tolerance or resistance has since worn off. Several wild cultivated okra species have significant levels of resistance to YVMV, however resistance transfer from wild relatives has been limited by sterility concerns, making following generations or even backcrosses problematic.

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Okra yellow vein mosaic virus is the most destructive disease which causes colossal losses up to 92 to 94% in the crop by affecting the quality and yield of fruits. Batra and Singh (2000) Rattan and Arvindbindal (2000), Rashid *et al.* (2000), Debnath and Nath (2003), Indrani *et al.* (2003), Anisha (2010), Amaranatha (2011), Benchasri (2011), Tiwari *et al.* (2012) and Reddy *et al.* (2013) also reported different degrees of resistance, hence the present studies were undertaken for the screening of okra varieties for the incidence of yellow vein mosaic virus.

## Materials and Methods

The present investigation was carried out in the department of vegetable crops College of Horticulture, Mojerla with 35 genotypes along with susceptible check PDKV Pragathi and two resistant checks *viz.*, Kashi Lalima and Parbhani Kranthi under field conditions during September 2021 to December 2021. The disease incidence was recorded at 15 days interval up to 105 days after sowing based on scale zero is equal to immune, one to 10 is equal to highly resistant, 11 to 25 is equal to moderately resistant, 26-50 is equal to tolerant 51 to 60 is equal to moderately susceptible, 61 to 70 is equal to susceptible and 71 to 100 is equal to highly susceptible (Table 1) (Ali *et al.* 2005). The experiment was laid out in a randomised block design with 3 replications having a plot size of 4 sq.m. with a spacing of 45 cm x 30 cm. The percent disease index (PDI) was recorded and the results were presented the Table 2.

## Results and Discussion

In the present study, thirty-five okra genotypes along with three checks were screened for resistance or susceptibility to yellow vein mosaic virus. Out of

35 test genotypes, twenty genotypes found to be moderately susceptible to yellow vein mosaic virus, 10 genotypes found to be tolerant whereas five genotypes found to be susceptible and only one genotype showed highly susceptibility towards yellow vein mosaic virus. In this study none of the genotypes showed resistance or highly resistance reaction.

The genotype IC 42484 recorded the incidence of 71.2% (highly susceptible) which is highest among all the genotypes tested for YVMV resistance. Four genotypes *viz.*, IC39136 (61.7%) IC 40289 (62.2%), IC 42451 (61.2%) and IC 42456 (62.4%) were grouped into susceptible category. twenty genotypes found to be moderately susceptible to yellow vein mosaic virus whereas, IC 3412444.5% ICC 3913446.5% ICC 3913544.8% IC 42470 45.6 IC 4247244.8% EC 32936248.9% EC329366 48.7% EC 32942048.4% EC 32942148.9% EC 32942347.9% were grouped into tolerant category (Table 2). These results confirm the experimental results of Batra and Singh 2000 Rashid *et al.* (2002), Debnath and Nath (2003), Nizar *et al.* (2004), Benchasri (2011), Tiwari *et al.* (2012), Kamalpreet *et al.* (2013).

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**Conflict of Interest:** Nil.

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

Severity Grade	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 %

**Table 2.** Reaction of okra genotypes to yellow vein mosaic virus (YVMV) disease in the field (under natural condition)

S.No.	Accession name	Disease (%)	Severity Grade	Reaction of Genotypes
1	IC33823	52.4	4	Moderate Susceptibility
2	IC33853	54.2	4	Moderate Susceptibility
3	IC34124	44.5	3	Tolerant
4	IC39132	51.8	4	Moderate Susceptibility
5	IC39133	58.4	4	Moderate Susceptibility
6	IC39134	46.5	3	Tolerant
7	IC39135	44.8	3	Tolerant
8	IC39136	61.7	5	Susceptibility
9	IC39137	52.4	4	Moderate Susceptibility
10	IC39143	57.5	4	Moderate Susceptibility
11	IC40289	62.2	5	Susceptibility
12	IC42451	61.2	5	Susceptibility
13	IC42456	62.4	5	Susceptibility
14	IC42464	54.2	4	Moderate Susceptibility
15	IC42470	45.6	3	Tolerant
16	IC42472	44.8	3	Tolerant
17	IC42484	71.2	6	Highly Susceptibility
18	IC42490	52.4	4	Moderate Susceptibility
19	EC329362	48.9	3	Tolerant
20	EC329364	58.4	4	Moderate Susceptibility
21	EC329365	55.4	4	Moderate Susceptibility
22	EC329366	48.7	3	Tolerant
23	EC329367	58.5	4	Moderate Susceptibility
24	EC329368	55.1	4	Moderate Susceptibility
25	EC329369	51.9	4	Moderate Susceptibility
26	EC329370	54.2	4	Moderate Susceptibility
27	EC329371	57.9	4	Moderate Susceptibility
28	EC329372	52.5	4	Moderate Susceptibility
29	EC329384	55.5	4	Moderate Susceptibility
30	EC329406	58.9	4	Moderate Susceptibility
31	EC329418	51.4	4	Moderate Susceptibility
32	EC329420	48.4	3	Tolerant
33	EC329421	48.9	3	Tolerant
34	EC329422	51.8	4	Moderate Susceptibility
35	EC329423	47.9	3	Tolerant
36	Kashi Lalima (R. Check)	22.8	3	Moderate resistant
37	Parbhani Kranthi(R. Check)	21.6	3	Moderate resistant
38	PDKV Pragathi (S. Check)	62.8	5	Susceptibility

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