



SCREENING OF BHENDI [*ABLEMOSCHUS ESCULENTUS* (L.) MOENCH] GENOTYPES AGAINST YELLOW VEIN MOSAIC VIRUS FOR RESISTANCE UNDER FIELD CONDITION

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Abstract

A field experiment was carried out to screen thirty genotypes of bhendi for yellow vein mosaic virus resistance in Department of Horticulture, Faculty of Agriculture, Annamalai University, Chidambaram during summer season. The results showed that IC 043750, IC 045792, IC 069304 and IC 282228 were completely free (Immune) to yellow vein mosaic virus incidence, while IC 113904, IC 282233, IC 113922, IC 282238, IC 218881 and IC 282243 showed moderately resistant (MR) reaction. The genotypes, IC 085581, IC 069303 and IC 282227 were found to be susceptible (S). Rest of the genotypes viz., IC 069172, IC 069242, IC 069254, IC 069257, IC 085583, IC 282226, IC 282229, IC 282230 and IC 282239 were found to be highly susceptible (HS). The highest fruit yield was recorded in IC 218886 (317.00 g) followed by IC 282246 (294.50 g), whereas, IC 072082 produced the lowest yield (76.30 g).

Keywords : Yellow vein mosaic virus, Screening, Bhendi (*Abelmoschus esculentus* L.).

Introduction

Bhendi [*Ablemoschus esculentus* (L.) Moench] is considered as an important vegetable crop of the tropical and sub tropical regions of the world. India ranks first in the world with a production of 6.35 mt (Indian Horticulture Database, 2014). After onion, bhendi has the major share in revenue generation through export of fresh vegetable. Bhendi is considered even superior to tomato, egg plant and most cucurbits in its Average Nutritive Value (ANV) and hence assumes significance from social, economic and pharmacological perspectives (Joshi and Murugan, 2013). The mature seed of okra is reported to be a good source of oil and protein (Oyelade *et al.*, 2003).

The crop is prone to damage by various insects, fungi, nematodes and viruses. Its cultivation in India is challenged by severe incidence of viral disease known as Yellow vein mosaic virus (YVMV), spreaded by an insect vector, namely whitefly (*Bemisia tabaci* Gen.). YVMV belong to the genus *Begomovirus*, family Geminiviridae. Recently, it was found that at 27 begomoviruses infect bhendi. Begomoviruses have high recombination rate and the emergence of 'B' biotypes whiteflies is contributing to epidemics of begomoviruses in bhendi. The YVMV disease is characterized by a homogeneous interwoven network of yellow vein enclosing island of green tissues within the leaf. In extreme cases, infected leaves become

completely yellowish or creamy (Sanwal *et al.*, 2014). If plants are infected within 20 days after germination, their growth is retarded with few leaves and malformed fruits resulting in loss ranging from 94 to 100%. The extent of damage declines with delay in infection of the plants. A loss of 49 to 84% has been reported when infection occurred after 50 to 65 days of germination (Ali *et al.*, 2005).

Hence, cultivation of disease resistant variety as a control measure of plant disease is more economical and environmentally safer than that of chemical control. Varietal resistance in okra to YVMV has been reported by Prakasha *et al.* (2010) and Vijaya and Joshi *et al.* (2013). In this context, the above experiment was conducted to screen the resistant genotypes of okra YVMV under field condition.

Materials and Methods

The experiment was conducted in vegetable unit, Department of Horticulture, Faculty of Agriculture, Annamalai University, Chidambaram during summer season 2018. Thirty bhendi genotypes collected from N.B.P.G.R. Regional station, Thrissur and sown in Randomized Block Design with three replications at a spacing of 45 x 30 cm. The crop was maintained following the recommended agronomic practices except the pesticides spray to keep the vector population. The thirty genotypes were evaluated under field condition. The observations on percentage of disease incidence

were taken from 15 days after sowing up to 90 days after sowing.

$$PDI = \frac{\text{Number of diseased plants}}{\text{Total Number of plants}} \times 100$$

PDI = Percentage of Disease Incidence, (Sankara and Acharyya, 2012)

Based on the YVMV disease ratings scale (Ali *et al.*, 2005) the genotypes were characterized as resistant or susceptible.

Table 1 : Scale for classifying disease reaction against YVMV

Severity Grade	Rating Scale	Disease Incidence (%)
0	Immune (I)	0
1	Highly resistant (HR)	1-10
2	Moderate resistant (MR)	11-25
3	Tolerant (T)	26-50
4	Moderate susceptible (MS)	51-60
5	Susceptible (S)	61-70
6	Highly susceptible (HS)	71-100

Result and Discussion

Thirty genotypes were screened for okra yellow vein mosaic disease under field conditions during summer, 2018. The mean yellow vein mosaic disease incidence varied from 0.00 to 100.00 per cent. Highest yellow vein mosaic incidence (100.00 per cent) were recorded in the genotypes *viz.*, IC 069254, IC 069257, IC 282229, IC 282230 and IC 282239, while Six genotypes, IC 113904, IC 282233, IC 113922, IC 282238, IC 218881 and IC 282243 showed moderately resistant (MR) reaction whereas the varieties, IC 085581, IC 069303 and IC 282227 were found to be susceptible (S). Rest genotypes *viz.*, IC 069172, IC 069242, IC 069254, IC 069257, IC 085583, IC 282226, IC 282229, IC 282230 and IC 282239 were found to be highly susceptible (HS) during summer months of 2018. The genotypes *viz.*, IC 043750, IC 045792, IC 069304 and IC 282228 were found immune to yellow vein mosaic virus incidence. Similar results were also reported by Benchasri (2011).

The highest fruit yield was recorded in IC 218886 (317.00 g) followed by IC 282246 (294.50 g), IC 282245 (293.68) and IC 282243 (290.67 g). Whereas, IC 072082 produced the lowest yield (76.30 g).

Result of this study indicated that IC 043750, IC 045792, IC 069304 and IC 282228 were found to be most promising variety against yellow vein mosaic infestation in the field condition. These genotypes could

be a useful source of resistant genes to yellow vein mosaic virus. Similar works have been reported by Tiwari *et al.* (2012) and Kumar and Raju (2017) in screening of bhendi varieties to yellow vein mosaic virus.

Table 2 : Performance of different genotypes of bhendi against to YVMV during summer season under field conditions of Chidambaram region

Genotypes	Yield plant ⁻¹ (g)	Percentage of Disease Incidence	Reaction
IC 043750	216.30	1.17	I
IC 045792	268.18	12.534	I
IC 45802B	213.25	34.311	T
IC 045824	88.07	38.508	T
IC 085581	194.37	62.181	S
IC 069172	184.77	81.188	HS
IC 069242	135.95	69.824	HS
IC 069254	219.98	88.83	HS
IC 069257	152.85	88.83	HS
IC 069303	178.40	51.968	S
IC 069304	103.78	1.17	I
IC 085583	100.93	73.545	HS
IC 072082	76.30	34.787	T
IC 282226	205.72	77.466	HS
IC 282227	177.00	62.181	S
IC 282228	129.08	1.17	I
IC 282229	169.23	88.83	HS
IC 252230	124.45	88.83	HS
IC 113904	183.63	27.819	MR
IC 282232A	109.25	31.541	T
IC 218874	165.35	31.065	T
IC 282233	245.08	27.819	MR
IC 113922	249.72	27.819	MR
IC 282238	237.50	24.097	MR
IC 218881	222.03	27.819	MR
IC 282239	210.95	88.83	HS
IC 218886	317.00	38.508	T
IC 282243	290.67	27.819	MR
IC 282245	293.68	34.787	T
IC 282246	294.50	34.787	T

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