



## Research Article

# EVALUATION OF BHENDI (*Abelmoschus esculentus* L. Moench) HYBRIDS FOR QUANTITATIVE TRAITS, YVMV AND FSB

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**Abstract-** The present investigation for the Evaluation of Bhendi (*Abelmoschus esculentus* L. Moench) Hybrids for quantitative traits, YVMV and FSB was carried out at Allahabad region with 11 hybrids and 2 check varieties during *kharif-2015* under randomized block design with three replications. The data was recorded for seventeen quantitative characters plant height (cm), days to first flowering, no. of fruits/ plant, weight of fresh fruit(g), weight of fruit/plant(g), weight of fruit/plot, yield per plant, diameter of fruit (cm), length of fruit (cm), days to 1<sup>st</sup> appearance of YVMV incidence, YVMV infestation on plants, YVMV infestation on fruits, Severity of YVMV infestation, Coefficient of YVMV infestation, Fruit and Shoot Borer (FSB) infestation on shoots, and FSB infestation on plants to obtain estimate the best hybrid for quantitative traits, YVMV resistance and FSB resistance. Fruit yield per hectare was ranged from 10.43 tones (Arkaanamika) to 37.31 tones (OKHYB-10) with an average of 19.66 tones and YVMV infestation on plants (%) was ranged from 0 % (OKHYB-10) to 52.93 % (Arkaanamika) with an average of 29.16 %, YVMV infestation on fruits (%) was ranged from 0 % (OKHYB-10) to 22.63 % (Arkaanamika) with an average of 13.01 % where as FSB infestation on shoots (%) was ranged from 0 % (OKHYB-10) to 24 % (Arkaanamika) with an average of 13.20, FSB infestation on fruits (%) was ranged from 0 % (OKHYB-10) to 20.25 % (Arkaanamika) with an average of 11.47. It is concluded that based on the mean performance of the of all the seventeen along with YVMV and FSB characters hybrids OKHYB-10, OKHYB-09, OKHYB-04, and OKHYB-01 were found superior and resistant to YVMV and FSB in performances than check varieties.

**Keywords-** Bhendi, YVMV, FSB, Hybrids, Resistance.

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## Introduction

Bhendi (*Abelmoschus esculentus* L. Moench) belongs to family Malvaceae with 2n=130 chromosomes. It is one of the most important vegetable crops, which is grown throughout the tropical and sub tropical parts of the world [1]. It is a specialty pod vegetable, which is very popular in India. Its fruits have high nutritive, medicinal and industrial value and export potential. Its fruits are rich in vitamins, calcium, potassium and other mineral matters [2] Okra seed oil is rich in unsaturated fatty acids such as linoleic acid [3] Okra is praised for its medicinal values, as its fruits are useful in genito-urinary disorders, spermatorrhoea and chronic dysentery. Okra is often cross-pollinated where the natural cross-pollination occurs from 8.75 to 9.61%. Okra is highly susceptible to frost and requires warm climate for fruit production. Yellow Vein Mosaic Virus (YVMV) transmitted by white fly (*Bemisia tabaci*) is the most serious disease of okra. The proportion of the total yield to be sold as marketable yield is largely dependent on incidence of FSB and YVMV, which are the important yield determinants in okra of these YVMV is most serious viral diseases with an incidence of 3.2 to 97.8 [4] causing yield loss of 10 to 90 % [5] Cultivars from different countries have certain adapted distinguishing characteristics specific to the country to which they belong [6]. Hence it is of practical importance to develop a high yielding hybrid or variety coupled with resistance/tolerance to the YVMV

## Materials and Method

The experimental material included 13 hybrids viz. (OKHYB-01, OKHYB-

02, OKHYB-03, OKHYB-04, OKHYB-05, OKHYB-06, OKHYB-07, OKHYB-08, OKHYB-09, OKHYB-10, OKHYB-13, ArkaAnamika, HOK-152) and were sown during rainy season of the year 2015-16 in Randomized block design with three replications at Vegetable Research Farm, Department of Horticulture, Sam Higginbottom Institute of Agriculture Technology & Sciences, Allahabad, U. P. Row -to-Row and Plant -to-plant spacing were maintained 50 cm and 30 cm, respectively. All the agronomic packages of practices were adopted to grow a healthy crop in each replication. Randomly 5 plants in each genotype were marked for observation. Observations were recorded in 17 characters viz., plant height (cm), days to first flowering, no. of fruits/ plant, weight of fresh fruit(g), weight of fruit/plant(g), weight of fruit/plot, yield per plant, diameter of fruit (cm), length of fruit (cm), days to 1<sup>st</sup> appearance of YVMV incidence, YVMV infestation on plants, YVMV infestation on fruits, Severity of YVMV infestation, Coefficient of YVMV infestation, Fruit and Shoot Borer (FSB) infestation on shoots, and FSB infestation on plants. The recorded data were analyzed as suggested by [7] for analysis of variance.

## Results and discussion

The results presented in [Table-1] indicated the presence of significant variation for all the parameters of the different hybrids and check varieties. Plant height was ranged from 106.80 cm (HOK-152) to 144.73 cm (OKHYB-10) with an average of 129.82 cm, Days to first flowering was ranged from 33.00 days (OKHYB-1) to 42.33 days (Arkaanamika) with an average of 37.40 days, No. of

**Table-1** Performance of quantitative characters of Okra hybrids

S. No	Treatments Parameters	OKHYB-1	OKHYB-2	OKHYB-3	OKHYB-4	OKHYB-5	OKHYB-6	OKHYB-7	OKHYB-8	OKHYB-9	OKHYB-10	OKHYB-13	ArkaAnami ka (CHECK)	HOK-152 (CHECK)	CD	CV
1	PLANT HEIGHT	137.40	136.47	125.07	139.90	122.53	125.30	128.20	134.33	141.17	144.73	132.77	112.93	106.80	5.19	2.37
2	DAYS TO FIRST FLOWERING	33.00	37.17	40.00	34.00	39.00	38.17	37.60	36.00	34.50	35.00	37.50	42.33	42.00	1.51	2.39
3	NO. OF PODS PER PLANT	24.93	23.43	18.30	25.60	17.80	19.03	20.03	22.50	27.87	30.60	21.53	16.10	17.03	0.88	2.38
4	AVERAGE FRUIT WEIGHT	14.50	13.47	11.00	15.07	10.70	11.43	11.68	12.70	17.33	18.30	12.57	9.73	10.13	1.36	6.24
5	FRUIT WEIGHT PER PLANT	361.47	315.64	201.38	385.85	190.48	217.35	234.05	285.57	483.41	559.74	270.72	156.66	172.72	36.65	7.37
6	FRUIT WEIGHT PER TREATMENT	9036.83	7891.08	5034.50	9646.33	4762.00	5433.72	5851.37	7139.17	12085.3	13993.5	6768.00	3916.58	4317.9	916.17	7.37
7	FRUIT WEIGHT PER HECTARE	24.09	21.02	13.42	25.72	12.69	14.48	15.60	19.03	32.22	37.31	18.04	10.43	11.51	2.44	7.37
8	FRUIT GIRTH (cm)	6.07	5.89	5.50	6.11	5.49	5.53	5.61	5.83	6.12	6.25	5.80	5.27	5.20	0.27	2.77
9	FRUIT LENGTH (cm)	11.63	11.43	10.45	12.76	10.05	10.60	11.02	11.32	12.44	11.83	11.11	9.52	9.98	1.04	5.58
10	NO. OF SEEDS PER FRUIT	65.00	60.93	54.97	66.23	52.50	55.00	56.83	68.00	70.00	59.27	57.97	45.60	48.00	1.33	1.35
11	DAYS TO 1ST APPEARANCE OF YVMV	68.33	64.27	55.37	70.00	52.23	56.60	58.67	62.53	0.00	0.00	60.50	38.33	41.67	2.07	2.54
12	YVMV INFESTATION ON PLANTS (%)	16.00	23.33	43.07	12.00	46.00	39.60	35.73	28.00	0.00	0.00	32.40	52.93	50.00	2.99	6.08
13	YVMV INFESTATION ON FRUITS (%)	9.95	11.13	18.02	7.89	19.24	16.93	15.79	12.59	0.00	0.00	14.09	22.62	20.91	0.68	3.10
14	SEVERITY OF YVMV INFESTATION	25.33	32.00	52.00	18.67	53.33	45.33	44.00	33.33	2.00	0.00	38.67	80.00	69.33	4.90	7.65
15	COEFFICIENT OF YVMV INFESTATION	4.11	7.47	22.37	2.19	24.51	17.81	15.37	9.29	0.00	0.00	12.51	42.11	34.67	1.93	7.75
16	FSB INFESTATION ON SHOOTS (%)	8.40	10.67	20.00	5.07	21.33	17.87	16.00	11.87	0.00	0.00	13.60	24.00	22.80	0.85	3.83
17	FSB INFESTATION ON FRUITS (%)	8.74	10.07	15.85	7.97	16.63	14.93	13.50	10.85	0.00	0.00	12.26	20.25	18.09	0.56	2.89

Pods per plant was ranged from 16.10 (Arkaanamika) to 30.60 (OKHYB-10) with an average of 21.91, Average fruit weight was ranged from 9.73 gm (Arkaanamika) to 15.30 gm (OKHYB-10) with an average of 12.97 gm, Fruit yield per plant was ranged from 156.66gm (Arkaanamika) to 559.74 gm (OKHYB-10) with an average of 295.00, Fruit yield perplot was ranged from 3.91 kg (Arkaanamika) to 13.99 kg (OKHYB-10) with an average of 7.37 kg, Fruit yield per hectare was ranged from 10.43 tones (Arkaanamika) to 37.31 tones (OKHYB-10) with an average of 19.66 tones, Fruit girth was ranged from 5.20 cm (HOK-152) to 6.25 cm (OKHYB-10) with an average of 5.74 cm, Fruit length was ranged from 9.52 cm (Arkaanamika) to 12.76 cm (OKHYB-04) with an average of 11.09 cm, No. of seeds per fruit was ranged from 45.60 (Arkaanamika) to 70.00 (OKHYB-09) with an average of 58.48, Days to 1<sup>st</sup> appearance of YVMV was ranged from 0 days (OKHYB-10) to 70 days (OKHYB-04) with an average of 48.35 days, YVMV infestation on plants (%) was ranged from 0 % (OKHYB-10) to 52.93 % (Arkaanamika) with an average of 29.16 %, YVMV infestation on fruits (%) was ranged from 0 % (OKHYB-10) to 22.63 % (Arkaanamika) with an average of 13.01 %, severity of YVMV infestation was ranged from 0 (OKHYB-10) to 80 (Arkaanamika) with an average of 38.00, Co-efficient of YVMV infestation was ranged from 0 (OKHYB-10) to 42.11 (Arkaanamika) with an average of 14.80, FSB infestation on shoots (%) was ranged from 0 % (OKHYB-10) to 24 % (Arkaanamika) with an average of 13.20, FSB infestation on fruits (%) was ranged from 0 % (OKHYB-10) to 20.25 % (Arkaanamika) with an average of 11.47. The similar results were also described by other workers [8-11].

#### Conclusion:

It is concluded that based on the mean performance of the of all the seventeen along with YVMV and FSB characters hybrids OKHYB-10, OKHYB-09, OKHYB-04, and OKHYB-01 were found superior and resistant to YVMV and FSB in performances than check varieties.

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#### Abbreviations:

YVMV – Yellow Vein Mosaic Virus

FSB- Fruit and Shoot Borer

#### Conflict of Interest: None declared

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