

Evaluation of Biological Gene Pool of Cultivated Okra, *Abelmoschus esculentus* (L.) Monech, for Yield Characters

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ABSTRACT

Thirty-nine genotypes of okra were evaluated for various phenotypic characters including yield under the agro-climatic conditions of Jammu. The genotype BS - 14 yielded more than 170.0 q/ha and ranked top which was due to optimum number of fruits and average fruit weight. The yield range of Varsha Uphar, Arka Anamika and Arka Abhay was between 150 - 160 q/ha recording superiority of 18.70, 10.64 and 5.48% higher than the check variety Pusa Sawani. Hissar Unnat, Varsha Uphar and Sel-2 were earlier in fruit setting where the plants took 46.33, 47 and 47 days to 50% flowering and 1st flower appear on 4.73, 5.27 and 6.13 nodes. Critical difference analysis showed significant variation for all the attributes considered in the study inferring that hybridization between the available germplasm can yield superior segregants upon selfing. The lines BS-14, Varsha Uphar, COS-05-10 and Arka Anamika have the potential to be considered for directly as open pollinated varieties for wider cultivation.

Key words: Evaluation, genotypes, earliness, yield, okra

INTRODUCTION

Okra is an important warm season fruit vegetable, cultivated extensively in the world. Because of its high nutritive value and prolong shelf life as compared to other vegetables, okra has captured a prominent position among the export oriented vegetable crops. Besides a large number of open pollinated varieties, there are only few which show wider adaptation under diverse agro-climate of Jammu region (Kumar *et al.*, 2006). But there is always the search for only those lines / varieties which perform better in both these characters. Keeping in view, the above-mentioned objectives an experiment was laid out on 39 genotypes of okra for assessing their performance under the agro-climatic conditions of Jammu region.

MATERIAL AND METHODS

The experimental material consisted of thirty-nine genotypes of okra. The experiment was laid out in randomized block design with three replications during summer season of 2006 at Vegetable Experimental Farm, S. K. University of Agricultural

Sciences & Technology (J), Chatha, Jammu. Each entry was sown at 45 x 30 cm spacing, accommodating 30 plants in three rows per replication of 3.0 m length. All the recommended package of practices was followed for raising a healthy crop. The observations were recorded from 10 competitive plants from each replication on eight parameters *viz.*, plant height (cm), number of branches/plant, days to 50% flowering, node at which 1st flower appear, internodal length (cm), average fruit weight (g), number of fruits/plant and fruit yield q/ha. The analysis of variance was done as suggested by Panse and Sukhatme (1978).

RESULTS AND DISCUSSION

The study revealed greater variation with respect to earliness and yield attributing parameters in different okra genotypes (Table 1). On the basis of earliness the genotypes were grouped into early, mid and late. The grouping was done, keeping days to 50% flowering and node at which first flower appears. The genotypes showing comparatively less number of days to 50% flowering were Hissar Unnat (46.3days) followed by Varsha Uphar (47.0days), Sel-2 (47.0days), COS-05-10 (47.0days), VRO-4 (48.0days), COS-05-08 (48.0days), Arka Anamika (48.7days), COS-05-09 (49.0days), VRO-5 (49.0days), BS-14 (49.0 days), Pusa A-4 (49.0days) and NDO-10 (49.0days) respectively. Rest of the genotypes was put under mid to late flowering period. The lines showing flowering at earlier node were Punjab-7 (3.8) and Arka Abhay (3.8), followed by BS-14 (4.2), COS-05-17(4.3), VRO-5 (4.6), COS -05-15(4.7), Hissar Unnat (4.7), and COS-05 10(4.7). Rest of genotypes showed flowers statistically at higher nodes. The lines showing earliness in flowering at earlier nodes were BS-14, Hissar-Unnat, VRO-5 and COS-05-10, whereas the remaining genotypes also performed better for either one or both the characters. The minimum internodal distance was recorded in BS-12 (2.8cm), followed by VRO-5(2.9cm), COS-05-11(3.1cm), BS-14 (3.5cm), Sel-2 (3.5cm), Varsha Uphar (3.6cm) and NDO-10 (3.6cm). The results of Amanullah *et al.*, (1999) in okra are in complete agreement with the present study.

On the basis of yield, the lines which crossed fruit yield of 150 q/ha were BS-14 (171.7 q/ha), Varsha Uphar (160.1q/ha), Arka Anamika (152.6 q/ha), Arka Abhay (152.4 q/ha), VRO-5 (152.4 q/ha), Sel-2 (151.7 q/ha) and VRO-3 (151.0qtha). The line BS-14 yielding maximum was having fruit number of 19.7 with average fruit weight of 12.5 g. Another line performing better on yield basis was Varsha Uphar which showed the yield of 160.1 qt/ha having 18.2 fruits per plant with average weight of 12.9 g. Both these lines recorded an average yield advantage of 18.7% and 10.67% respectively over the check Pusa Sawani whose yield was 144.7 q/ha with 16.6 fruits per plant having fruit weight of 13.2 g. Rest genotypes showed the yield ranging between 84.2 q/ha (Com. 22) to 149.3 q/ha (Punjab-7). Similar findings were reported by Maurya *et al.*, (1979) while evaluating the lines of okra at Banaras condition.

Table 1: Yields and yield attributing characters of okra genotypes

Genotype	Plant height (cm)	No. of branches/plant	Days to 50% flowering	Node at which 1 st flower appear	Inter-nodal distance (cm)	Average fruit weight (g)	No. of fruits/plant	Yield (q/ha)
Pusa Sawani	134.87	0.40	51.33	4.60	4.83	13.20	16.57	144.67
Punjab – 7	125.07	1.00	50.00	3.80	4.97	11.20	20.07	149.33
Arka Abhay	124.87	0.80	53.67	3.80	3.63	10.60	20.60	152.37
Arka Anamika	118.47	1.27	48.67	4.87	3.80	10.93	20.00	152.60
COS-05-15	132.87	1.00	49.67	4.67	4.50	12.73	15.00	133.47
COS-05-16	117.40	1.33	51.67	5.20	3.83	11.80	18.13	149.10
COS-05-17	122.67	0.80	49.33	4.33	3.70	12.07	17.80	149.80
COS-05-18	125.53	0.60	48.00	5.33	4.13	11.27	18.40	144.67
COS-05-19	111.20	0.60	48.33	5.00	4.20	7.57	18.33	98.70
COS-05-20	105.67	1.60	50.00	4.87	4.03	11.60	17.00	137.67
COS-05-21	136.67	0.80	51.33	5.53	4.57	10.15	19.47	138.13
COS-05-13	99.77	1.07	53.00	6.67	4.00	11.53	17.00	136.97
VRO – 3	122.13	0.80	47.00	5.90	4.40	10.80	20.00	150.97
VRO – 4	106.20	1.20	48.00	5.00	3.67	11.60	16.07	130.20
VRO – 5	84.73	0.40	49.00	4.60	2.87	15.33	15.00	152.37
VRO – 6	115.27	1.20	50.00	5.13	4.40	12.10	17.00	143.97
Hisar Unnat	120.60	1.07	46.33	4.73	3.67	10.93	18.00	136.97
Varsha Uphar	121.23	0.80	47.00	5.27	3.57	12.60	18.20	160.07
Sel. 2	129.13	0.60	47.00	6.13	3.53	12.87	16.93	151.67
Pusa Makhmali	98.13	1.20	52.00	6.00	4.43	12.67	14.13	125.07
Perkins L G	112.47	1.07	53.00	8.20	5.87	13.53	15.00	141.87
BS-14	91.93	0.67	49.00	4.20	3.53	12.47	19.73	171.73
Pb. Padmini	130.20	0.40	52.33	6.67	4.60	12.93	10.20	91.70
Parbhani Kranti	109.43	0.67	53.00	6.00	4.60	16.00	14.13	147.93
BS-12	80.33	0.60	53.00	6.27	2.80	12.47	16.13	140.23
Pusa A-4	121.33	1.27	49.00	7.00	4.10	12.47	15.07	131.13
COS-05-22	148.80	1.73	51.33	7.20	4.27	15.20	12.27	130.20
NDO-10	121.80	1.47	49.00	5.93	3.63	12.17	15.47	131.13
COS-05-5	104.00	1.60	50.00	6.00	3.90	12.23	15.07	128.80
COS-05-6	110.33	0.73	60.00	6.47	3.77	10.00	15.13	105.23
COS-05-9	135.07	0.60	48.00	5.47	3.77	13.80	15.13	145.60
COS-05-11	122.60	0.80	52.00	5.93	3.13	11.67	17.00	138.60
Com. 22	103.67	0.67	52.00	5.00	3.93	8.53	14.13	84.23
COS-05-1	104.00	0.40	52.00	5.67	4.67	12.80	13.13	117.37
COS-05-2	115.40	1.00	51.00	4.80	3.80	11.60	17.00	137.67
COS-05-4	102.20	0.80	54.00	5.60	4.53	11.20	14.00	109.67
COS-05-7	120.03	1.80	52.00	4.87	4.90	10.27	18.47	132.30
COS-05-8	100.33	0.80	48.00	5.67	5.43	10.87	16.07	122.03
COS-05-10	111.73	1.07	47.00	4.67	4.60	12.33	20.00	154.00
Grand Mean	115.33	0.94	50.43	5.46	4.11	11.95	16.74	135.90
CV	5.48	11.28	3.41	11.15	12.41	5.99	7.46	4.24
CD at 5%	10.26	0.63	2.77	0.99	0.83	1.16	2.03	9.37

The advantage of certain lines was done on the basis of optimum plant height, number of branches per plant with minimum inter-nodal distance. The plant height which ranged between 80.3 cm (BS-12) to 148.8cm (COS-05-22) was 91.9 cm in BS-14 and 121.2 cm in case of Varsha Uphar. Plants of these lines showed 0.67 and 0.80 number of branches with 3.5 cm and 3.6 cm inter nodal distance. In okra, it is not only the plant height which decides the over all performance, but it is the number of nodes with minimum internodal distance which bears maximum number of fruits. Therefore, the lines showing such characters are always good yielder. It was also studied that the line with maximum plant height was having comparatively minimum number of flowering nodes might be due to longer internodal distance, which affect the total yield, whereas the lines with medium height bearing maximum number of flowering nodes at closer spacing performed better. The present study is duly supported by the findings of Maurya *et al.*, (1978) in okra under Banaras condition.

The study revealed that only those lines which were having maximum number of fruits with maximum weight and optimum morphological plant type were found superior and lines which showed fruiting at lower node and took minimum days to flowering were found promising better so for as early yield is considered. On the basis of above observed parameters it was concluded that BS-14 and Varsha Uphar were outstanding. Hence could be recommended for commercial cultivation as open pollinated varieties under the agro-climatic conditions of Jammu after large scale testing in farmer's fields.

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