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COMPARATIVE STUDIES ON FIFTEEN GENOTYPES OF OKRA *(ABELMOSCHUS ESCULENTUS*(L.) MOENCH) FOR VEGETATIVE CHARACTERS

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Abstract

Okra is one of the important vegetable of tropics and subtropics. The present study was carried out to study the differences among the 15 genotypes on the basis of vegetative characters such as days to first flowering, plant height, primary branches per plant, nodes per plant, inter nodal length, number of fruits per plant, fruit diameter, number of ridges per fruit, fruit weight, green fruit yield. The genotypes differ in the majority of the morphological characters.

Keywords **:** Vegetative characters, Okara genotypes

Introduction

Okra (*Abelmoschus esculentus* (L.) Moench.) an annual, often cross-pollinated crop belonging to the family Malvaceae, is an important vegetable crop of the tropics and subtropics of the world. It has found its place in India since time immemorial. Okra is also referred to as gumbo, lady's finger and bhendi. Africa is the center of origin of okra (Shalan *et al*.,). Almost all parts of the Bhendi are economical. The tender fruits of okra are the good source of iodine. Besides appreciable amount of minerals such as calcium, magnesium, potassium and iron, it is nutritionally rich compared to tomato, eggplant and most of the cucurbits. It also possesses important medicinal properties. The okra leaves are used in medicine to soothe and reduce the inflammation (Mehta, 1959). The pods contain adequate amount of iodine, which aidsin curing goiter. Leaves and parts of roots are used in clarification of gur/Jaggery. Okra stem is a good source of fiber suitable for papermaking. The fresh pods are mainly used as vegetable in various culinary preparations and also processed into canned, frozen and dehydrated forms. The essential specifications for export quality of fresh bhendi are dark green, tender, fibreless, short (7-8 cm), slender pods with fruits having pointed tip and five ridges, free from Yellow Vein Mosaic Virus (YVMV) and incidence of borer. Considering the remunerative market price and its export value, several varieties are available for cultivation. Besides, National Research Institutes and State Agricultural Universities, a number of private seed companies are also engaged in releasing high yielding, YVMV resistant and fruit borer tolerant varieties. An important way to increase productivity in any crop plant is to first select desirable genotypes from among the existing variations and to use the superior types in the breeding programme. The extent of initial of variability/ genetic diversity determines the level of crop improvement to a large extent. Traditionally, a combination of morphological and agronomic traits are used to evaluate genetic diversity. It requires a large set of phenotypic data that are often difficult to assess and most of these are vegetative in nature that are influenced by environmental factors which show continuous variation and have a high degree of plasticity (Chattopadhyay *et al*., 2005). Morphological or phenotypic descriptors have traditionally been used to distinguish one accession from the other. Although this type of agronomical characterisation provides useful information, they are subjected to environmental influences, time-consuming and they must be assessed during a fixed vegetative phase of the crop. The present study was carried out to study the phenotypic differences among fifteen genotypes to find the superior genotypes.

Materials and Methods

The present study was carried out at the Department of Genetics and Plant Breeding farm, Faculty of Agriculture, Annamalai University. The experimental design was completely randomised block design with two replications. The study consists of 15 genotypes. All the cultural practices were followed for the cultivation. Five plants were selected per treatment in each replications and the following observations were recorded. 1. Days to 50 per cent flowering (DFF): Number of days taken from the date of sowing to complete flowering in fifty per cent plants by each entry in each replication was recorded 2.Plant height (PH): Height of the plant was measured using a meter scale from the ground level to the tip of plant at first harvest and was recorded in centimeters. 3. Primary branches per plant (PB):Number of branches arising from the main stem above the ground level was recorded at harvest. 4. Nodes per plant: The number of nodes per plant present on main stem at harvest was counted and recorded as the number of nodes at harvest. 5. Internodal length (cm) The internodal length was computed by dividing the height of plant by number of nodes per plant and expressed in centimeters. 6. Number of fruits per plant: The total number of fruits from first to last harvest was counted 7. Fruit diameter (cm): The diameter of the fruit was measured at middle of the fruit by using vernier calipers and recorded. 8. Number of ridges per fruit: The number of ridges per fruit was counted on three randomly selected plants in each replication and the average of that is recorded. 9. Fruit weight (g): The average weight of fruit was computed from total weight of five randomly selected fruit in each selected plants. 10. Green fruit yield per plant: The green fruit weight per plant for all pickings were recorded and the same was expressed in grams. All the obtained data were subjected to

statistical analysis using the analysis of variance method and the means of thegenotypes were compared by using least significant difference (L.S.D) at the level of 5% of probability according to (Shalan *et al*., 2011).

Results and Discussion

The comparative analysis of 15 genotypes was done for characters Days to 50 percent flowering, Plant height, Primary branches per plant, Nodes per plant, Number of fruits per plant, Fruit diameter, Number of ridges per fruit, Fruit weight, Green fruit yield per plant. The results revealed the genotypes differ in their vegetative characters. The results are presented in the Table1. The genotype Okra Short White was characterised with long number of days to flowering and Okra Elephant Tusk was with short number of days to flowering. The highest plant height was recorded in the Tree Okra and the lowest is Okra Green. The maximum number of primary branches per plant was recorded in Okra Multi Branch White and the minimum was in Okra Elephant Tusk and Hill Okra. Okra Plain was recorded with the highest number of nodes per plant and and the lowest was recorded with Tree Okra and Arka Anamika. The maximum mean internodal length was found in the genotype Okra Sharp and the minimum was found in the genotype Okra Short. Okra Long Bommidi had the maximum mean fruit length and Okra short had the minimum fruit length. Okra long Bommidi has the maximum fruit girth and Okra short white and CO1 has minimum fruit length. The highest number of ridges per fruit was recorded in the genotype Okra Multi Branch white and the lowest number was recorded in CO1. Arka Anamika was recorded with maximum fruit weight and Okra long Bommidi was recorded with minimum fruit weight. The highest yield was obtained in the genotype Arka Anamika and the lowest yield was obtained in the genotype Okra Short. The study revealed that the genotype Okra long Bommidi was the superior for the characters fruit length and fruit girth. The genotype Okra Elephant Tusk, Okra Plain, Okra Sharp, Okra Multi Branch White, Arka Anamika was superior for the characters number of days to flowering, number of nodes per plant, internodal length, number of ridges per fruit and highest yield respectively.

Table 1: Vegetative characters of different genotypes of Okara.

Genotype	DFF	PH	NPB	NOP	MIL	FL	FG	NOR	FW	NFP	YPP
Okra elephant tusk	36	98	1.01	16.88	8.50	12.90	6.09	5.26	16.32	17.17	136.9
Okra Red	38	84.50	1.75	12.25	7.70	12.60	5.69	6.40	17.74	17.68	166.68
Okra Plain	40	138	1.25	21.34	8.20	13.26	5.78	5.59	13.14	18.63	84.10
Okra Short	39	79.17	1.84	15.17	5.41	10.07	6.20	5.97	11.48	8.10	176
Okra short white	44	76	2	12.51	8.42	10.79	5.6	5.74	9.69	16.50	320
Okra sharp	39	108	2.17	15.25	10.41	17.37	7.02	6.67	14.56	18.81	296.18
Okra long Bommidi	43	130.38	2.38	12.5	9.24	20.48	7.23	6.92	9.59	18.75	266.7
Okra cow horn	37	128.04	1.59	17.25	14.6	14.25	6.93	6.50	15.35	19.17	193.78
Okra multi branch red	42	158.25	3	16	8.34	14.22	6.72	5.32	16.67	12.0	378.81
Okra multi branch white	38	95	2.70	17.23	5.50	13..69	6.85	7.00	13.92	16.25	349.7
Hill okra	41	83.50	1.01	10.67	7.77	11.05	6.38	5.91	10.29	15.50	377.22
Tree okra	39.50	160.50	2.06	6.23	9.09	13.37	6.30	6.70	15.71	18.71	249.96
Okra green	42	64	2.34	9.64	6.08	13.72	7.07	6.74	9.79	18.23	277.29
Co1	38.50	104.31	1.50	18.5	8.78	12.46	5.60	5.26	17.10	21.52	335
Arka Anamica	46	145	1.60	6.23	6.57	13.50	6.72	6.47	17.90	23	430
Mean	40.20	105.51	1.88	13.84	7.97	12.66	6.41	6.16	13.95	17.33	262.55
Standard Error	0.49	6.54	0.12	0.77	0.52	0.48	0.10	0.11	0.54	0.63	19.39

DFF = Days to 50% floweringPH = Plant height (cm)NPB= Primary branches per plant NOP = Nodes per plant MIL = Mean internodal length (cm)FL = Fruit length (cm)
FG = Fruit girth (cm)NOR = Ridges per fruit FW = fruit weight (g) NFP = Fruits per plant YPP = fruit yield per plant (g)GM = General mean
SEm ± = Standard error of mean

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