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## Studies on Morpho: Genetic variation of okra

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### Abstract

The present study reveals thirty six genetically diverse genotypes of Okra were used to find out the similarities and differences on morphological traits. Among all the genotypes only twenty seven succeeded to germinate. A dendrogram was observed to determine the relationship between the genotypes. Accordingly, one pair of genotypes showed similarity which is the least percent of similarity between any two genotypes in Okra population. Five genotypes of short growth habit, less fruit length and vast fruit diameter grouped under one linkage. All the data obtained disclosed that the genotypes significantly varied from each other. Okra genotypes; 000025 and 000026 produced strong branches with fruits near to the ground, but gave high yield to get a best type of okra varieties having high yield for commercial productions.

**Keywords:** Okra, genotypes, diverse genotype, germination

### Introduction

Okra (*Abelmoschus esculentus* L.) belongs to family Malvaceae, contains vitamins, fat, carbohydrate, fiber, iron, iodine and is a major protein source in nearly all developing countries. Its fruits contain glycosides, a small amount of Ca, P, Mg and K. A mucilaginous preparation from the fruit has set up an application as a plasma substitute or blood level expander<sup>[2]</sup>. The high contents of linoleic acid and amino acid in the seed render it an adequate supplement to legume based diets<sup>[3]</sup>. Okra leaves are considered as good cattle feed, and are also used as an emollient, antiscorbutic, chronic ulcers and continual dysentery<sup>[2, 4]</sup>. Characterization of okra is of great importance for current and future genetic improvement program of crop. Genetic miscellany is moreover used to learn the taxonomic link between genotypes and to select varieties of good characters and include them into propagation programmes<sup>[7]</sup>.

The objective of study reveals the inheritance pattern of morphological traits and analyzing the variation of Okra.

### Materials and methods

Thirty six genotypes were used for the experiment. Among these thirty six genotypes thirty were obtained from Indian Agriculture Research Institute, New Delhi. The experiment was designed to complete block with three replications. The land was ploughed and seeding was done. Seedling was reduced to a few numbers per row after 15 days of germination. The watering was done on proper time. The crop for Okra was standardized and was used to measure the various parameters of growth.

**Statistical Analysis:** The cluster analysis was performed for morphological qualitative and quantitative parameters of Okra.

### Results

The Significance of germplasm collection depends on the genetic variations that exists among the germplasm<sup>[9]</sup>. The present study of Okra genotypes showed a significant growth and production. A great variation was observed among okra branching<sup>[8]</sup>. These variation in branching could be the result of selection or a natural adaptation mechanism. The maximum genotypes showed erect growth habit and medium type of branching was in high frequency. Erect plant growth is an important character for high yield<sup>[10]</sup>. Okra having genotypes; 000024 and 000026 produced strong branches with fruits near to the ground and high fruit yield for commercial productions.

The correlation of okra genotypes showed that maximum plant height and flowering recorded significant positive correlation (Table 2) [11]. This study showed a significant variation in the number of fruits/plant. According to the result of correlation analysis maximum plant height recorded significant positive correlation with fruits per plant, which indicates that performance of Okra plant is favored by plant height and thus should be preferred for constituent of yield [12]. The genotype 000017 showed the tallest fruits with a length of 25 cm followed by 000026 with 24.6 cm. (Table 1).

Cluster analysis of okra genotypes (Dendrogram) divided 20 genotypes into Linkage 1 (L1) and Linkage 2 (L2) separated at 90% genetic distances (Fig.1).

Negative correlation among fruit length and fruit width shows that any increase in fruit length will bring a decline in fruit diameter. While a decrease in this characters will inversely increase fruit diameter. The negative correlation between days to 50% flowering and fruits per plant in the present research support the result of these workers.

**Table 1:** Variation in different characters among Okra genotypes.

No.	Accessions	Br	MPh (cm)	FL (cm)	FW (cm)	FF	SF	1000sw (g)	DDF 50%	DDFr 50%	Fl-Fr (days)
1	000002	7	61.0	14.6	1.8	10	90	79.5	64	67	04
2	000009	7	68.6	9.6	2.8	8	98	76.5	65	68	04
3	000010	7	63.5	18.7	1.8	9	77	69.9	63	65	03
4	000013	7	69.9	22.8	1.9	11	58	63.4	63	66	04
5	000018	7	73.7	19.7	2.6	11	97	72.6	65	68	04
6	000019	5	99.1	25	2	18	58	74.5	36	40	05
7	000021	5	99.8	22.3	2.1	19	58	74.8	37	40	04
8	000025	5	82.6	17.7	2	17	51	83.3	36	40	05
9	000026	5	88.9	24.6	1.8	19	50	74.3	38	40	03
10	000027	5	80.3	19.6	1.9	16	64	62.9	38	40	03
11	000029	5	63.8	22.5	1.9	14	65	72.1	38	41	04
12	000032	5	63.0	20.3	2	14	65	66.7	53	55	03
13	000034	7	53.3	15.8	2.6	16	62	52.6	41	43	03
14	000035	5	61.7	17.7	1.9	14	49	66.0	41	43	03
15	000036	7	50.8	16.4	2.6	17	62	62.9	40	43	04
16	000038	5	85.9	17.8	1.8	21	70	72.2	41	43	03
18	020138	5	81.3	22	1.9	19	65	74.3	52	54	03
20	020216	5	63.5	19.8	1.9	16	71	79.4	37	39	03
25	020339	5	92.2	20.6	1.8	21	72	73.9	37	39	03
27	020376	5	79.5	18.7	2	19	72	78.9	36	39	04
28	020393	5	93.2	20.1	1.8	20	79	51.3	36	40	05
29	020515	3	84.1	21.8	1.9	17	62	67.7	37	39	03
30	020535	3	68.1	20.5	1.6	10	68	66.7	41	43	03

Br: Branchin, MPh: Maximum plant height, FL: Fruit length, FW: Fruit width, FF: Fruit/plant, SF: Seeds/fruit, 1000 (g) sw: 1000 g seeds weight, DDF50%: Days to 50% flowering, DDFr50%: Days to 50% fruiting, Fl-Fr: Interval b/w flowering to fruiting.

**Table 2:** Correlation among Okra genotypes.

	MPh	FL	FW	FF	SF	1000sw	DDF50%
MPh	1						
FL	0.362	1					
FW	-0.492	-0.498**	1				
FF	0.672**	0.342	-0.225	1			
SF	-0.142	-0.433**	0.324	-0.39	1		
1000sw	0.173	-0.014	-0.110	-0.071	0.104	1	
DDF50%	-0.462**	-0.38	0.349	-0.617	0.578**	0.095	1

MPh: Maximum plant height, FL: Fruit length, FW: Fruit width, FF: Fruit/plant, SF: Seeds/Fruit, 1000sw: 1000g seeds weight, DDF50%: Days to 50% flowering

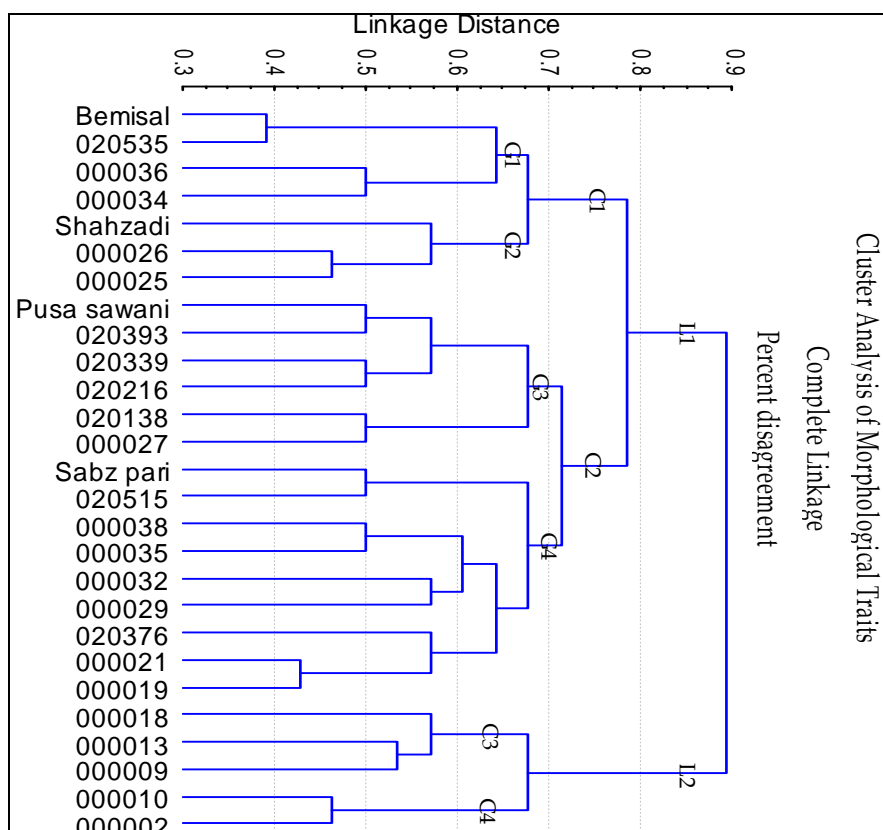


Fig 1: Cluster analysis among Okra genotypes.

### Conclusion

The significant variations among okra genotypes may be due to either environmental factors or variations in the genetic potential of genotypes. On the basis of agronomic characteristics genotypes 000019, 000021, 000025, 000026, 000036, 020138, 020339, 020393, are selected for genomic study to confirm morphological diversity.

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