STUDIES ON VARIABILITY IN OKRA (*ABELMOSCHUS ESCULENTUS* (L.) MOENCH)

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Abstract: Twenty five genotypes of Okra collected from IIVR, Varanasi were evaluated in summer, 2008 to study the variability for 15 different characters. The treatment mean squares were significant for all 15 characters studied. Recommended agronomic and cultural practices were adopted to obtain good phenotypic expression of the characters. The characters number of branches/ plant, fruit yield/ plant and days first flowering at fruit set should high GCV and PCV estimates. Medium to high and high heritability was recorded for all the characters studied. The characters fruit length no. of ridge per fruit (100%), days of first flowering (89%),plant height(86%) and plant per cent affect by YVMV(84%) showed high heritability estimate, however these characters were coupled with varied genetic advance i.e. high, medium and low respectively suggesting complexity of genetic mechanism in expression of those traits. The additive genetic variance was reported by traits like plant height, no of branches per fruit,fruit length, fruit diameter and no. of fruit per plant.

Key words: Okra, Hybridization, Genotype.

INTRODUCTION

Okra is an important vegetable crop grown for its tender green pods, throughout India, Africa, Turkey and other neighboring countries. Fruit yield in Okra depends upon many yield components, since it is a polygenic character. The variability various characters is a prerequisite for plant breeder. Variability along with high to medium genetic advance provide enough scope for selection, however an opposite of this suggests hybridization as potential method for crop improvement.

In present investigation attempt has been made to assess the variability of important yield and yield contributing traits, along with the indices of variability i.e. GCV and PCV, heritability (h^2) and genetic advance (ga). This study will facilitate an understanding behind expression of character and also the role of environment there in.

MATERIALS AND METHODS

Twenty five genotypes from IIVR, Varanasi, and other local sources were evaluated during summer 2008. The individual genotype was represented by a single row of 2.5 m length. The row to row spacing of 30 cm and plant to plant spacing 20 cm was adopted. The recommended package of practices viz. Plants production and protection measure were taken up for successful crop growth. The observation of 15 traits were recorded on five randomly selected plants of each entry i.e. each row. The data generated was subjected to analyse the variability through GCV, PCV, and h^2 as suggested by Burton (1952) and Johnson *et al*., 1955 for GA.

RESULTS AND DISCUSSION

Parameters of genetic variability in 25 genotypes of Okra. Significant differences were observed among genotypes for all the characters studied.

The treatment squares were significant for all the characters suggesting the presence of good amount of variation. Wide range of variation were recorded for all characters, suggesting presence of high genetic variability. The character viz. plant % affect by YVMV, plant% affect by milibug, fruit yield/plant, plant height, fruit yield/ha wide range variation, suggesting the presence of variability for these characters and also offers scope for selecting better variable genotype of exploit yield in Okra.

While looking to estimates of GCV and PCV (Table 1) it was observed that the characters plant% affect by YVMV, plant% affect by milibug, no. of branches/plant fruit yield/plant, fruit yield per ha exhibited magnitudinally higher GCV and PCV estimates than rest of characters suggesting the presence of variability for these traits. These result confirm the earlier finding of Reddy *et al.* (1985) and Vijay Manohar (1990). The GCV and PCV were moderate magnitude for plant height, green fruit yield/plot, no of fruit per plant, no of ridge/fruit.

The characters days of first flowering, fruit diameter, Vitamin 'C', fruit length and weight of per fruit had very low GCV and PCV estimates suggesting narrow range of variation for these character and provides very least scope for selection. These result confirm the finding of Vijay and Manohar (1990) and Gondane and Lal (1994) for days of first flowering, Patel and Dalal (1992) for fruit diameter.

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Table 1.

Character	Range (cm)	General mean	GCV%	PCV%	Heritability (b.s.)	GA
Plant height (cm)	94.40-33.46	72.98	18.20	19.54	86	34.91
No. of leaf/plant	19.80-11.63	14.96	10.93	13.32	67	18.49
No of Branch/plant	2.93-0.73	1.37	37.00	45.00	67	62.66
Days of first flowering	46.93-35.80	37.83	5.32	5.63	89	10.38
Fruit length (cm)	15.11-9.70	11.77	10.11	13.20	58	15.96
Fruit diameter (cm)	2.811.90	1.94	9.11	11.62	61	14.72
No. of ridge/fruit	8.00-5.00	5	13.59	13.59	100	20.01
Average weight of fruit /g	17.66-11.33	15.11	10.73	14.32	56	16.58
Fruit yield/plant (g)	135.49-52.02	84.75	18.19	28.80	44	24.33
Green fruit yield/plot (kg)	3.40-1.29	2.12	17.84	27.80	41	23.59
Fruit yield/ha (tones)	22.57-8.66	14.15	18.09	27.92	42	24.16
No. of fruits/plant	8.26-3.93	5.67	14.53	21.80	44	19.16
Vita. 'C' mg/100g	18.42-12.16	16.45	9.21	13.59	46	12.88
Plant% affect by YVMV	35.00	10.20	47.37	163.15	84	28.33
Plant% affect by millbug	13.88	2.22	36.27	167.39	47	16.19

The magnitudinal differences between GCV and PCV were very high for plant% affect by milibug (131.92) and plant% affect by YVMV (115.78) suggesting the role at environment in expression of these characters. This also implies that one should not rely on mean phenotypic values for direct selection of these traits. The heritability (bs) estimates were of high magnitude for almost all traits (Table1) The no. of ridge (100) recorded the highest heritability followed by the characters to days of first flowering (89), plant height (86), plant% affect by YVMV (84), no. of leaf/plant (67) have recorded heritability estimates of second order. Jayapandi and Balakrishnan (1992) reported similar finding for yield/plant, number of branches/ plant and fruit length and Thakur *et al*. (1996) for fruit diameter, plant height and fruit yield/plant.

The high heritability estimates of no. of branches and plant height were coupied with high magnitude of expected genetic advance indicating existence of additive gene action in the expression of these characters. This suggested the possibility of improving these characters through direct selection. These result coincide with those obtained by Jeyapandi and Balakrishnan (1992), Thakur *et al*. (1996); Panda and Singh (1997) and Atanur (1999) for fruit yield/ plant.

The moderate heritability coupled with moderate genetic advance was observe for characters viz. plant/affect by YVMV, fruit length, fruit yield//plant. Likewise for number of branches/plant moderate heritability was coupled with high genetic advance, indicating the prevalence of additive genetic variance for these traits. Jayapandi and Balakrishanan (1992), Thakur *et al*. (1996) and Atanur (1999) recorded similar finding. The non additive genetic variance was suspected in the character with moderate (no. of branches/plant, plant height) and low (plant % affect by milibug, days of first flowering heritability with, low genetic advance. However, to arrive at valid conclusion there is need to conduct series at such experiments by changing location and genotypes.

The characters with high GCV and PCV, plant% affect by YVMV, plant% affect by milibug, no. of branch/ plant and fruit yield per ha also recorded high heritability and high genetic advance. This high lighted the fact that in variability studies one should not rely upon phenotype alone, while making selection it is always better to consider PCV, GCV along with high heritability.

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