

ESTIMATES OF VARIABILITY, HERITABILITY AND CORRELATION FOR YIELD AND ITS COMPONENTS IN *VIGNA RADIATA* (L) WILCZEK

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A wide variation and range was noticed in six economic plant traits in twenty one varieties of Mungbean studied. Both genotypic and phenotypic coefficient of variation were high for pods per plant and plant height. The estimates of heritability and expected genetic advances were high for days to flowering, plant height and pods per plant. The association analysis revealed that yield per plant had positive association with plant height. Present study indicated a high positive genetic relationship of plant height with seed yield.

Key words: Variability, heretability, yield, *Vigna radiata*.

The estimates of genetic variability is a prerequisite in breeding programme for increasing yield, quality, resistance to diseases and pests. The heritability which is the fraction of total variances due to genetic cause is an important index of selection efficiency. Since yield is a polygenic character and is dependent on its components, it is important to study the correlation of various yield contributing characters which provide informations on their relative importance for selection. Importance of these parameters has been emphasized by Singh and Malhotra (1970) and Singh and Singh (1973) in Mungbean. With this idea present study was conducted with 21 diverse genotypes of Mung.

MATERIALS AND METHODS

A set of 21 diverse cultivars of Mungbean was planted under four environments (two in Gwalior and two in Morena) at the Zonal Research Station, Morena and college of Agriculture, Gwalior during Kharif season of 1980-81 & 1981-82. The genotypes were sown in randomised complete block design with three replication. Each plot consisted of 12 rows of 6 meters long length and spacing between was 45 cm and plant to plant 15 cm. Five competitive plants were selected from each genotype of each replication to record the observation of days to 50% flowering, plant height (cm) days to maturity, pods per plant, seeds per pod, 100 seed weight and seed yield per plant. Coefficients of phenotypic and genotypic variability, heritability and genetic advance were calculated according to the method of Burton (1952). The estimation of genotypic and phenotypic correlation of coefficient were worked

Table 1: Range, Mean, Genotypic and Phenotypic coefficient of variability, Heritability and Genetic advance values of 21 Mung Genotypes at 4 locations.

Character	Range	Mean	Coefficient of variability		Heritability %	Genetic Advance
			Genotypic	Phenotypic		
Plant height (Cms.)	35.5-69.9	52.7	9.36	28.10	40.47	18.32
Days to flowering	37.55	46.0	4.11	13.54	78.72	22.23
Pods per plant	6.7-29.2	18.0	13.42	58.16	39.71	18.96
Seed per pod	9.7-12.2	11.0	3.15	11.45	27.97	00.76
Days to maturity	62-92	77.0	5.43	21.45	53.42	10.98
Yield per plant (gms.)	2.4-5.1	3.8	9.05	28.04	47.97	01.26
100 seed weight (gm.)	2.3-3.5	2.9	8.66	11.78	45.27	00.50

out by the formula of Johnson *et al* (1956).

RESULTS AND DISCUSSION

The variance due to genotypes were significant for all the characters under study for all environments. The characters showed a wide range of phenotypic variations. A major portion of the total variance was contributed by genotypic component. The range of genotypic coefficient of variation was between 3.15 (seeds per plant) to 13.42 (pods per plant) and phenotypic coefficient of variation in between 11.45 (seeds/plant) to 58.16 (pods/plant). Table 1 The maximum variability was found for pods at both genotypic as well as phenotypic level. On the contrary the lowest variability was observed for seeds per pod.

The present investigation revealed that phenotypic coefficient of variation were higher than genotypic coefficient of variation for all the characters. These results suggested that the selection would

Table 2: Phenotypic and genotypic correlation between yield and various characters

Character correlation	Plant height	Days to flowering	Pods/plant	Seeds/Pod	Days to maturity	100 seed weight
Genotypic	0.7780	-0.2589	0.1386	-0.0995	-0.3452	-0.1657
Phenotypic	0.5650	-0.3072	0.2695	0.3067	-0.1906	0.0181

* Significant at 5%

** Significant at 1%

be effective by selecting the genotypes possessing more number of pods per plant than any other character under. The present study was in agreement with the findings of Guzhove *et al.* (1981). The expected genetic advance and heritability estimates were high for days to flowering. The days to flowering (78.12%) showed the highest heritability while lowest for seeds/plant (27.9%). The genetic advance varied from 0.5 to 22.23 (100 seed weight) to 22.23(days to flowering)

100 seed weight (0.50), seeds/pod (0.76) and yield/plant (1.26) gave low values for expected genetic advance though the heritability was medium for almost all the characters except seeds/pod. This indicated that characters governed by additive and non-additive gene effect and genetic improvement could be possible for these characters. Patel and Shah (1982) also observed seeds per pod 100 seed weight and pods per plant had low genetic advance.

In character association study, the results revealed that the plant height was positively and significantly correlated with yield at both genotypic & phenotypic level. This indicated that more plant height more the yield. Similar results were reported by Sounderpandian

et al. (1976) in *Vigna mungo*. On the contrary other traits showed insignificant results. Days of flowering was negatively associated with yield. This revealed that early maturity genotypes were low yielder. Hence there must be compromise between yield and maturation.

We should finally conclude that in present investigation it is the pods per plant and days to flowering, and height has desirable combinations of high heritability complied with higher genetic advance.

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