



## Research Note

### Genetic studies in mungbean (*Vigna radiata* (L). Wilczek)

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#### Abstract:

A study was carried out in mungbean *Vigna radiata* (L.) Wilczek with eight 'lines' and four 'testers' crossed in a Line x Tester design to estimate mean, range, genotypic and phenotypic coefficients of variation, heritability and genetic advance for 13 traits viz., days to 50 % flowering, days to maturity, plant height, number of branches per plant, number of clusters per plant, number of pods per cluster, number of pods per plant, pod length, number of seeds per pod, 100 seed weight, harvest index, protein content and single plant yield. High heritability coupled with high genetic advance as per cent of mean were observed for plant height, number of branches per plant, number of clusters per plant, number of pods per cluster, number of pods per plant, 100 seed weight, harvest index and single plant yield confirming the additive gene action.

#### Key words:

Heritability, Mungbean, Genetic advance, Yield.

Mungbean (*Vigna radiata* (L). Wilczek) is one of the most important pulse crops in many Asian countries including India, China and Pakistan, since it can be grown in a wide range of environment and also a major source of high quality protein. In India the production is about 1.52 million tones. In Tamilnadu, it is cultivated in an area of about 1.34 lakh hectare with the production and productivity of 0.77 lakh tonnes and 577 kg per hectare respectively (Anonymous, 2008). Being the important legume crop, improving its productivity and quality traits is of crucial importance. To accomplish this, crop improvement should aim at broadening the genetic base of the breeding stock. Success in crop improvement generally depends on magnitude of genetic variability and the extent to which the desirable characters are heritable. The present investigation was undertaken to study the genetic variability in mungbean genotypes.

The present study was carried out at the Department of Plant Breeding and Genetics, Agricultural College and Research Institute, Madurai. The experimental material consisted of 12 genotypes, of which eight genotypes viz., VRM(Gg) 1, CO 6, CO(Gg) 7, VBN 1, K 1, KM 2, VBN(Gg) 2 and Pusha vishal were used as 'lines' and four genotypes viz., VGG 04-028, VGG 04-005, CGG 973 and VBN(Gg) 3 were used as 'testers'. These genotypes were crossed in a line x tester fashion and 32 hybrids were produced. These

hybrids along with their parents were raised during summer, 2010 in Randomized Block Design replicated thrice in ridges of four meter length with an inter row spacing of 40 cm and intra-row spacing of 20 cm. The recommended agronomic and plant protection practices were followed to maintain healthy stand of the plants. Data were recorded on five randomly selected plants in each genotype for the characters viz., days to 50 % flowering, days to maturity, plant height(cm), number of branches per plant, number of clusters per plant, number of pods per cluster, number of pods per plant, pod length(cm), number of seeds per pod, 100 seed weight(g), harvest index(%), protein content(%) and single plant yield(g). Genetic parameters like variance, genotypic and phenotypic coefficient of variation, heritability and genetic advance as per cent mean were calculated as per the standard procedure.

Analysis of variance for all the characters recorded the presence of significant genotypic differences justifying for further analysis. In general, phenotypic coefficient of variation and genotypic coefficient of variation showed a wide spectrum of variability in most of the characters studied. The GCV depends on the heritable part of variability and therefore it is regarded to be more useful for the assessment of inherent or real variability. In the present study, the variability for all the traits was estimated on the basis of phenotypic and genotypic co-efficient of variation.

The PCV value was found higher than the GCV for all the characters and the differences between them were very less indicating less environmental influence on those characters (Table 1). Higher per cent of GCV was recorded by harvest index followed by single plant yield, number of branches and number of clusters per plant.

Among the characters studied, plant height, number of branches per plant, number of clusters per plant, number of pods per cluster, number of pods per plant, 100 seed weight, harvest index and single plant yield recorded high heritability with high genetic advance, confirming the additive gene action. This was in conformity with the earlier findings of Anwari and Sochandi (1999) for the characters seed yield and plant height and Veeramani *et al.* (2005) for number of branches per plant, number of clusters per plant, number of pods per plant, number of pods per cluster and pod length.

Pod length, number of seeds per pod and protein content recorded high heritability coupled with moderate genetic advance. This may be due to dominant epistasis and least effect of additive gene action as opined by Srividhya *et al.* (2005) Rahim *et al.* (2010).

High heritability and low genetic advance was observed in days to maturity whereas, days to 50 per cent flowering recorded moderate heritability and low genetic advance. Muhammad Siddique *et al.* (2006) recorded high heritability for days to 50 per cent flowering. The characters like number of branches per plant, number of clusters per plant, number of pods per cluster, number of pods per plant, 100 seed weight, harvest index and single plant yield showed high heritability and genetic advance as per cent mean indicating the availability of sufficient heritable variation that could be made use in the selection programme.

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**Table 1. Estimates of genetic parameters for different characters in greengram**

<b>Characters</b>	<b>Mean</b>	<b>Range</b>	<b>PCV (%)</b>	<b>GCV (%)</b>	<b>Heritability (%)</b>	<b>GA as per cent of mean</b>
Days to 50 per cent flowering	35.61	33.0-38.0	4.82	3.18	43.57	4.32
Days to maturity	50.23	47.0-52.7	3.18	2.85	80.26	5.26
Plant height (cm)	51.79	38.8-65.6	14.60	14.27	95.55	28.74
Number of branches per plant	4.99	4.0-8.67	16.57	16.32	97.01	33.12
Number of clusters per plant	7.19	4.47-8.8	15.29	14.72	92.73	29.20
Number of pods per cluster	6.29	4.8-7.6	13.32	12.55	88.86	24.38
Number of pods per plant	43.76	30.7-52.5	14.47	14.07	94.64	28.21
Pod length (cm)	7.77	6.21-8.84	6.82	6.30	85.29	11.99
Number of seeds per pod	10.34	8.8-12.5	9.07	8.45	86.81	16.22
Hundred seed weight(g)	4.18	3.81-6.09	14.81	14.62	97.52	29.76
Harvest index (%)	35.04	30.0-39.9	27.05	25.94	91.91	51.23
Protein content (%)	25.38	20.2-28.9	8.16	8.08	97.95	16.47
Single plant yield (g)	19.22	12.6-28.7	21.63	20.97	94.01	41.90