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## Selection of genetic parameters for hybridization programme in rice bean (*Vigna umbellata* Thunb.)

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Genetic parameters of variation in twelve genotypes of rice bean were evaluated at RMDCARS, Ambikapur (IGKV), Raipur (C.G.) during Kharif 2013 and 2014. The phenotypic coefficient of variation was in higher than the corresponding genotypic coefficient of variation for all the characters. The high heritability accompanied with high genetic advance as percentage of mean was recorded for number of branches / plant and seed yield / plant whereas, high heritability with moderate genetic advance was showed for days to maturity. Therefore, selection may be effective for these characters due to additive gene action. Traits like maturity, number of branches / plant seed yield may be promising for hybridization programme in rice bean.

**Keywords:** rice bean, genotypes, genetic parameters

**Introduction**

Rice bean [*Vigna umbellata* (Thunb) ohwi and ohashi] is a multipurpose underutilized legume. It is also known as Raj mung. It is mostly grown on marginal stress conditions under without fertilization, thus yield is quite low. The vegetative parts are used as feed. The seeds are in mineral content and vitamins. The high nutritive value of rice bean is the reason for increasing research interest in this crop. To set up production in this crop, it is important to evolve varieties are capable of fostering maximum seed with nutritional and quality yield. A critical estimate of genetic parameters is a pre-requisite for initiating appropriate hybridization programme. The heritable variation is masked by non-heritable components. An analysis based on promising strains derived from large number of diverse parents is expected to give better and more reliable estimates. So, the present study was undertaken with a view to know the type of gene action governing the expression of seed yield and its related characters in rice bean.

**Materials and Methods**

An experiment was conducted under All India Coordinated Research Network Project on Potential Crops, RMDCARS, Ambikapur (Chhattisgarh) during Kharif 2013 and 2014. The present investigation consists of twelve promising strains including four standard check varieties. The name of genotyped and checks are: HRB- 216, LRB- 545, LRB – 553 ; LRB - 554, RRB -14, RRB -15, BRBM -119, BRBM -127, RBL-1 (Check), RBL -6 (Check), RBL - 35 (Check) and RBL -50 (Check). The experiment was conducted in Randomized Complete Block Design with three replications. Each genotype was sown in 4 m x 1.2 m. Row to row spacing was 30 cm. Five competitive plants for days to maturity, plant height (cm), number of branches/ Plant, number of leaves/ plant, 100 seed weight (g) and seed yield/ plant (g). The genetic coefficient of variation was estimated as suggested by Burton (1952) <sup>[1]</sup>. Heritability in broad sense was calculated according to the formula suggested by Hanson *et al.*, (1956) <sup>[3]</sup>. The expected genetic advance was estimated as suggested by Johnson *et al.*, (1955) <sup>[4]</sup>.

**Results and Discussion**

The parameters of genetic variability viz., genotypic and phenotypic in broad sense (%), genetic advance as percentage of mean for all the desirable characters under study were calculated and are presented in Table 1. In the present study, the phenotypic coefficient of variation (PCV) was found higher in magnitude than that of the genotypic coefficient of variation (GCV) for all characters. No. of leaves / plant observed the highest PCV and GCV

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followed by 100 seed weight and seed yield / plant. Rest of the characters found the lowest PCV and GCV. In agreement with the present findings, Pol *et al.*, (2001) [5] for number of leaves/ plant. Amount of high or moderate heritability coupled with high genetic advance as percentage of mean are normally more helpful in direct selection of the characters. However, it is not necessary that the character showing high heritability will also indicate high genetic advance. Similarly high or moderate heritability accompanied with low genetic advance as percentage of mean or vice versa indicates predominance of non-additive gene action.

The high heritability coupled with high genetic advance as percentage of mean was recorded number of branches/ plant and seed yield/ plant whereas, high heritability with moderate genetic advance was showed for days to maturity. The results indicated the preponderance of additive gene action. In conformity with the findings of the present study, high heritability coupled with high genetic advance have also reported by Baraskar *et al.*, (2014) [2] for number of branches/ plant. On the basis of heritability and genetic advance as percentage of mean the present investigation suggests that selection may be effective for these traits due to additive gene action.

**Table 1:** Estimation of genetic parameters for seed yield and its components in rice bean

S. N.	Characters	Mean	$\sigma^2_p$	$\sigma^2_g$	$\sigma^2_e$	PCV (%)	GCV (%)	H <sup>2</sup> (bs) (%)	Genetic advance as percentage of mean
1	Days to maturity	120	104.1	86.24	17.85	8.49	7.73	91.04	15.9
2	Plant height (cm)	145	1919.7	1299.5	620.28	30.21	24.86	82.29	5.10
3	No. of branches/ plant	7	2.8	2.19	0.60	23.9	21.14	88.45	43.33
4	No. of leaves/ plant	220	41179	19331.5	21848	92.23	63.19	68.51	13.0
5	100 seed weight (g)	5.5	23.57	9.2	14.31	88.27	55.14	62.46	11.3
6	Seed yield/ plant (g)	75	1497	891.9	605.1	51.58	39.81	77.18	47.2

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