



Genetic variability in faba bean (*Vicia faba* L.) for pod yield and its contributing traits

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Faba bean (*Vicia faba* L.) is a minor legume vegetable grown on marginal lands in hilly regions of India. Its production potential is low, as only the local collections are being grown. To initiate the improvement process, the present investigation was carried out to study the genetic variability in the available germplasm.

The experimental material comprised of 24 genotypes of faba bean (Table 1) which were evaluated in a Randomized Block Design with three replications

during rabi season (1998-99) at the Experimental farm of the Department of Vegetable Science, COA, Himachal Pradesh Krishi Vishvavidyalaya, Palampur (HP). Each genotype was grown in a plot measuring 1.8 × 1.5m consisted of four rows, spaced at 45cm with plants 10cm apart. Recommended package of practices was followed for growing the crop. The observations were recorded on 10 randomly selected plants of each genotype in each replication for pod yield, plant height,

Table 1. Faba bean genotypes alongwith their seed characteristics and sources

S. No.	Genotypes	Seed characteristic			Source
		Colour	Shape	size	
1.	EC-284347	Yellowish green	Round	medium	HPKV, Palampur
2.	EC-284366	Greenish yellow	Round	medium	HPKV, Palampur
3.	EC-284368	Red	Flat	large	HPKV, Palampur
4.	EC-284369	Yellowish green	Flat	large	HPKV, Palampur
5.	EC-284372	Yellowish green	Flat	large	HPKV, Palampur
6.	EC-284373	Brownish black	Flat	large	HPKV, Palampur
7.	EC-284374	Red	Flat	large	HPKV, Palampur
8.	EC-284375	Red	Flat	large	HPKV, Palampur
9.	HBB-1	Black	Flat	medium	HPKV, Palampur
10.	HBB-2	Red	Round	medium	HPKV, Palampur
11.	HBB-3	Brownish black	Flat	large	HPKV, Palampur
12.	HBB-4	Reddish yellow	Round	small	HPKV, Palampur
13.	HBB-5	Green	Round	large	HPKV, Palampur
14.	HBB-6	Yellow	Flat	medium	HPKV, Palampur
15.	DPBB-7	Reddish yellow	Flat	medium	HPKV, Palampur
16.	HPQ-1	Yellowish green	Flat	small	HPKV, Palampur
17.	HPQ-2	Brown	Round	small	HPKV, Palampur
18.	Palampur local	Red	Flat round	large	HPKV, Palampur
19.	Jwalamukhi local	Brownish black	Round	medium	HPKV, Palampur
20.	Solan local	Brown	Round	small	HPKV, Palampur
21.	Faizabad local-I	Reddish yellow	Round	medium	HPKV, Palampur
22.	Faizabad local-II	Brown	Flat	small	HPKV, Palampur
23.	Jabalpur selection-1	Yellowish green	Round	medium	HPKV, Palampur
24.	Jabalpur selection-II	Reddish yellow	Flat	small	HPKV, Palampur

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branches/plant, pods/node, pod length and seeds/pod. Data were subjected to analysis of variance, estimation of parameters of variability, heritability in broad sense and genetic advance as per cent of mean as per standard procedures.

The extent of variability present in faba bean germplasm was studied in terms of range, mean, standard error, phenotypic and genotypic coefficient of variation (Table 2). The genotypes showed a wide

genetic advance for branches/plant (71.7%, 0.69%) suggested that these traits are under the control of epistatic interactions. On the bases of genetic parameters estimated, it can be concluded that selection would be worthwhile for pod yield and associated traits to bring improvement in faba bean.

Table 2. Range, mean and estimates of parameters of variability for different traits in faba bean

	Plant height (cm)	Branches/ plant	Pods/ node	Pod length (cm)	Seed/ pod	Pod yield/plant (g)
Range	148.96-83.70	2.87-4.83	1.00-1.57	5.90-9.20	2.93-4.20	67.46-258.12
Mean \pm SE	65.26 \pm 2.58	3.89 \pm 0.25	1.19 \pm 0.05	7.58 \pm 0.21	3.62 \pm 0.16	158.94 \pm 8.91
GCV	13.62	12.70	11.95	11.53	10.41	39.05
PCV	14.46	15.00	13.05	12.00	11.74	39.65
h ²	88.8	71.7	83.9	92.2	78.6	97.0
GA	17.26	0.86	0.27	1.73	0.69	125.93
CD _{0.05}	5.19	0.50	0.10	0.42	0.32	17.97

range of variability with maximum in case of pod yield/plant (67.46 to 258.12g). Sufficient genetic variability for quantitative traits in faba bean has been reported earlier [1, 4&5]. This suggested that the material is amenable for selection. A perusal of the results revealed that the magnitude of phenotypic coefficient of variability (PCV) was higher than the genotypic coefficient of variability (GCV) for all the characters. The characters with wider range had comparatively higher estimates of genotypic and phenotypic coefficients of variability, indicating, thereby, that there is sufficient scope for bringing improvement in such traits. The estimates of heritability and genetic advance were high for pod yield/plant (97.0%, 125.93%) suggesting presence of additive gene action making this character to respond better to selection. Similar results have also been obtained by others [2, 6&7]. The higher estimates of heritability and lower estimates of genetic advance for plant height (88.8%, 17.26%), pod/node (83.9%, 0.27%) and pod length (92.2%, 1.73%) may be attributed to the non-additive gene effects. Dawwam *et al.* [3] also found high heritability and lower genetic advance for pod length. However, moderate heritability and low

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