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RK Yadav

Department of Genetics & Plant
Breeding College of Agriculture
(IGKV), Raipur, Chhattisgarh,
India

A study on genetic variation in some of faba bean (*Vicia faba* L.) genotypes in northern hill zone of Chhattisgarh

RK Yadav**Abstract**

Genetic variations in ten promising genotypes of faba bean (*Vicia faba* L.) were evaluated at RMDCARS, Ambikapur (IGKV), during *rabi* 2012-13 and 2013-14. The genotypes were significantly different for all the characters. Phenotypic coefficient of variation (PCV) was in higher magnitude than the corresponding genotypic coefficient of variation (GCV) for seed yield/plant, test weight and number of pods/plant. High heritability accompanied with high genetic advance as percentage of mean were showed for the traits like seed yield/plant, test weight, number of pods/plant and pod length. All these traits indicated preponderance of additive gene action which may be useful for direct selection by attempting crosses programme among these traits.

Keywords: genotypes, faba bean, genetic variation

Introduction

Vicia faba (2n=12) is a member of family fabaceae grown by tribal peoples for seed, vegetable, silage and forage purposes. It is an underutilized legume crop known by various names i.e. Bakla, Jalsemi, Field bean, Teak bean, Broad bean and Kalamatar. The exact information about acreage and production data in India is not yet known. It contributes to human nutrition due to its higher protein content and essential nutrients. Faba bean is rich in dopa which helps in controlling hypertension. Estimates of genetic parameters provide an indication of various types of gene effects. The present study was conducted with the objectives to estimate variability, heritability and genetic advance in faba bean genotypes grown in Northern Hill Zone of Chhattisgarh.

Materials and Methods

The experiment was carried out under AICRN on potential crops, RMDCARS, Ambikapur (C.G.) during *rabi* 2012-13 and 2013-14. The ten IET genotypes including one check variety named Vikrant were received from coordinating centres of HAU, Hisar; NDUAT, Faizabad and NBPGR, New Delhi. A row length of 4 m and spacing of 30x10 cm was maintained. The genotypes were sown in Randomized Block Design with four replications. All the recommended cultural package of practices was followed to raise a healthy crop growth. Five competitive plants from each replication were selected to record the observations (Table 1). Coefficient of variation was calculated as suggested by Burton (1952)^[1]. Heritability (BS) was calculated by Hanson *et al.*, (1956)^[2] and genetic advance by Johnson *et al.*, 1955^[3].

Results and Discussion

The mean and genetic parameters of different characters are given in table 1. In the present investigation, the phenotypic coefficient of variation (PCV) was in higher magnitude than the genotypic coefficient of variation (GCV) for all the traits. Seed yield/plant, test weight and number of pods/plant exhibited highest PCV and GCV. Similar findings were also reported by Kalia (2003)^[4] for seed yield/plant and 100 seed weight. Rest of the characters found had the lowest PCV and GCV.

The highest heritability in broad sense was observed for test weight, seed yield/plant, pod length, pods/plant, days to maturity and number of seeds/pod except plant height. Therefore it can be assumed that the genetic effect is more evident for these traits than the environmental effect. Moderate heritability accompanied with low genetic advance for plant height. These

Correspondence**RK Yadav**

Department of Genetics & Plant
Breeding College of Agriculture
(IGKV), Raipur, Chhattisgarh,
India

findings were in contrary with the findings of Mulualem (2013) [5]. High heritability coupled with high genetic advance as percentage of mean showed for the characters like seed yield/plant, test weight, pods/plant and pod length indicated the preponderance of additive gene action and selection based

on mean would be successful in improving these traits. High mean and high heritability genotypes can be useful for QTL mapping, diallele (Full and half both) analysis and generation mean analysis by attempting crosses programme among these characters.

Table 1: Mean and genetic parameters of different characters in faba bean

| S. No. | Characters | Mean | GCV (%) | PCV (%) | H ² (bs) (%) | GA as % of mean |
|--------|----------------------|-------|---------|---------|-------------------------|-----------------|
| 1. | Days to maturity | 126.5 | 5.46 | 6.28 | 86.94 | 14.10 |
| 2. | No. of pods/plant | 37.6 | 27.81 | 31.30 | 88.84 | 62.23 |
| 3. | Plant height (cm) | 95.2 | 7.61 | 11.72 | 64.93 | 19.41 |
| 4. | Pod length | 5.1 | 17.58 | 19.04 | 92.33 | 39.10 |
| 5. | No. of seeds/pod | 4.3 | 14.91 | 17.73 | 84.09 | 21.61 |
| 6. | Test weight (g) | 35.5 | 59.63 | 60.27 | 98.93 | 126.54 |
| 7. | Seed yield/plant (g) | 46.4 | 132.48 | 133.99 | 98.87 | 282.79 |

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