

**Studies on genetic variability, correlation and path  
analysis in French bean (*Phaseolus vulgaris* L.)  
under Lucknow conditions**

**Thesis**

SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

***Doctor of Philosophy***  
***in***  
***Horticulture***



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## Abstract

The present investigation entitled “**Studies on genetic variability, correlation and path analysis in French bean (*Phaseolus vulgaris* L.) under Lucknow conditions.**” The experiment consisting of twenty five genotypes for twenty two characters was laid out in Randomized Block Design with three replications grown at Horticulture Research Farm first of the Department of Applied Plant Science, (Horticulture), Babasaheb Bhimrao Ambedkar University, (A central university), Vidya Vihar, Rae Bareilly Road, Lucknow (U. P.), India during the year 2012- 2013 and 2013- 2014 to assess the variability, heritability, genetic advance, correlation, path and to identify/isolate desirable genotypes for different horticultural traits. The observations were recorded on twenty morphological and three quality traits. The studies revealed that there was wide variability in French bean for various characters studied. Analysis of variance for the design of experiment showed that the genotypes were highly sufficient for all the characters under study. The high magnitude of phenotypic and genotypic coefficient of variation were observed for 100-seed weight (g) followed by plant height (cm), green pod yield (q/ha), green pod yield/plant, green pod yield /plot and number of pods/plant. GCV is helpful in the assessment of inherent variability. GCV and PCV detect the amount of variability in the available genotypes. Heritability estimates give a measure of transmission of characters from one generation to another thus, given an idea of heritable portion of variability and enabling to the plant breeder in isolating the elite selection in the crop. Heritability and genetic advance increase the efficiency of the selection in breeding programme by assessing the influence of environmental factors and additive gene action. Heritability estimates for all the characters were high except 100-seed weight (g), plant height (cm), moisture (%), number of pods/plant, green pod yield (q/ha) and green pod yield/ plant (g). Suggesting the role of additive gene action and thus a high genetic gain and heritability along with genetic gain is more useful criterion in predicting the resultant effect for selecting the best individual. High heritability with high genetic advance was observed for 100-seed weight (g), green pod yield (q/ha), green pod yield/plant (g), plant height (cm) and number of leaves/plant. High heritability with high genetic advance tells that the character is governed by the additive gene action and for this simple selection is advocated. High heritability with medium genetic advance suggests that the character is governed by the dominant and epistatic gene action and for this hybridization is done. In all the studies, characters like days taken to first flowering and days taken to 50 % flowering were found with high heritability and medium genetic advance. In the present investigation,

primary branches/ plant, secondary branches/ plant, number of leaves /Plant, size of leaves (length and width cm), number of pods/ plant, number of grains/ pod, green pod length (cm), green pod width (cm), green pod breadth (cm), single green pod weight (g), green pod yield per plant (g), green pod yield per plot (kg), green pod yield (q/ ha) and 100- seed weight (g) are governed with non additive gene action. Suggesting the role of genotypic was generally similar nature than the corresponding phenotypic once. A very strong positive correlation of green pod yield/plot, at genotypic and phenotypic level was observed in green pod yield /plant, secondary branches/plant, 100-seed weight, number of pods/plant, primary branches/plant and plant height. A path coefficient analysis carried out at genotypic as well as phenotypic level revealed green pod yield/plant followed by green pod yield /plant, number of pods/plant, secondary branches/plant, primary branches/plant and plant height had positive direct effect on yield.

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