

## Gene effects of yield and its components in Indian mustard (*Brassica juncea* Czern & Coss.)

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Ten diverse parent of Indian mustard were crossed in 10 x 10 diallel design excluding reciprocals Analysis. of the data on seed yield and its ten component characters suggested that dominant genes were more frequent than recessive ones for all the characters studied except days to flower in both the generations. Symmetrical proportions of positive and negative genes were observed for days to flower, plant height and seed yield per plant, while asymmetrical proportions of positive and negative genes were observed for the remaining characters. More than one major gene groups were involved in the inheritance of most of the characters. Predominance of non-additive gene action was observed for seed yield and its components characters. The exploitation of non-additive gene action through heterosis breeding or population improvement by intermating the improved genotypes in successive generations is suggested for improvement of seed yield and its component characters.

Key words : Indian mustard, Diallel analysis, Gene action.

### INTRODUCTION

Rapeseed - mustard groups of crops plays a very important role in the oilseeds economy of our country. India is the second largest rapeseed mustard growing country in the world and ranks third next to Canada and China in production, its productivity is much lower (941kg/ha) than the world's average (1511kg/ha) which received great attention of breeders for its genetic improvement as it has exhibited greater production potential under varying environment as it has exhibited greater production potential under varying environment. To enhance the present yield level and overcome yield stagnation it is essential to reshuffle the genes through hybridization in suitable parents. For this, it is necessary to identify gene action involved in the expression of various yield contributing characters. In the present investigation, efforts have been made to understand the nature and estimate the genetic component of seed yield and its contribution in Indian mustard.

### MATERIALS AND METHODS

The experimental material comprising the diverse genotypes of Indian mustard, viz, RK 9807, RK 9808, RK 9803, RK 8605, NDR-8501, Mathura Rai, Rohini, Basanti, Vardan and Varuna. These parents maintained as purelines by selfing for several generations were crossed in half diallel fashion. The experiment comprising

100 treatments (10 parents, 45 F<sub>1</sub>s and 45 F<sub>2</sub>s) were evaluated in a Randomized Block Design with three replications during Rabi 2002-03 at Oilseeds Research Farm Kalyanpur, Kanpur of C.S. Azad University of Agriculture and Technology, Kanpur. Each parent and F<sub>1</sub>s were grown in single row and each F<sub>2</sub>s in two rows of five metre length spaced at 45 x 15 cm apart. All recommended agronomic practices were adopted for raising a good crop. Ten plants each from parents and F<sub>1</sub>s and 20 plants from F<sub>2</sub>s were randomly selected for recording the observations on eleven characters (Table 1). The data were subjected to genetic analysis of following Hayman (1954 a, b) and Jinks (1954).

### RESULTS AND DISCUSSION

The estimated components (Table 1) revealed that the highly significant additive (D) and dominance (H) gene actions were noticeable for all the characters studied except for seed yield per plant for which only dominance component was significant in both the generations. This indicated that both additive and non-additive gene action were important in controlling days to flowering, days to maturity, plant height, primary & secondary branches, length of main raceme, number of siliquae on main raceme, seeds per siliqua, 1000-seed weight and oil-content. The present findings were supported by the reports of Jain *et al.* (1988), Kumar *et al.* (1994), Pahuja *et al.* (1996), Kant and Gulati (2001) and Sridhar and Raut

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