

## Genetic analysis of yield and yield attributing characters in linseed (*Linum usitatissimum* L.)

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A field experiment was conducted at Oilseed Research Area, Department of Plant Breeding and Genetics, IGKV, Raipur (CG) during Rabi 2004-05 to estimate heterosis, Inbreeding depression, heritability, genetic advance and genetic analysis of seed yield and its components in four crosses of linseed. The experimental material comprised of five parents namely, Solan, Kiran, R 552, LCK 88062, Polf 22 and SIKO 10 and their  $F_1$ ,  $F_2$  and  $F_3$  generations of four different crosses namely, Solan x R 552, Solan x LCK 88062, Solan x Polf 22, Solan x SIKO 10. The hybrids  $F_1$ ,  $F_2$ ,  $F_3$  were evaluated along with their parents in randomized complete block design with four replications. The observations were recorded for aforesaid studies. The analysis revealed that significant positive heterosis were observed for Days to 50% flowering, plant height, no. of secondary branches per plant, no. of capsule per plant and seed yield per plant. High heritability estimate coupled with high genetic advance as percentage of mean for number of primary branches per plant, number of secondary branches per plant, number of capsules per plant, number of seeds per plant and seed yield per plant indicated contribution of additive gene effects for the expression of these traits. Hence, selection on these characters for improvement would be effective. The relative comparison of main gene effect revealed major contribution of dominance effects associated with dominance x dominance type of interaction effects in the expression of all the characters in the crosses. Duplicate type of epistasis played a major role in the expression of most of the characters studied in the crosses.

**Key words :** Linseed, Genetic analysis, Yield and its components, Variability analysis

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### INTRODUCTION

Linseed (*Linum usitatissimum* L.) is an ancient plant, which is also known as flax. In India, the crop is mainly cultivated in the states like Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Maharashtra, Rajasthan, West Bengal, Karnataka, Orissa and Bihar. Chhattisgarh is one of the important linseed growing states of India, which account 112.52 thousand hectare area and 34.20 thousand metric tones production. Success in yield improvement programme largely depends on the nature and magnitude of genetic variability already present in the germplasm. Selection of parents based on phenotypic performance of quantitative characters is not much effective due to presence of genotypic-environment interaction. Hence, knowledge of heterosis for yield and its components give an idea about the possibility for the improvement of seed yield either by developing hybrids or to isolate desirable lines out of segregating population of high heterotic hybrids. The knowledge of variability, heritability and genetic advance become important for an efficient breeding

programme. The estimates of gene effects have direct bearing on the method of hybridization and selection may be adopted in a variety of specific breeding programme. Since yield is a complex quantitative character and is governed by a number of other traits, the exact association between these characters with yield must be known for effective selection. Thus, the present investigation has been carried out to understand the genetic architecture of yield and its components.

### RESEARCH METHODOLOGY

The experiment was conducted at Oilseed Research Area, Department of Plant Breeding and Genetics, Indira Gandhi Krishi Vishwavidyala, Raipur with five parents namely, Solan, R 552, LCK 88062, Polf 22 and SIKO 10 and their  $F_1$ ,  $F_2$  and  $F_3$  generations of four different crosses namely, Solan x R 552, Solan x LCK 88062, Solan x Polf 22, Solan x SIKO 10. The hybrids ( $F_1$ ),  $F_2$ ,  $F_3$  were evaluated along with their parents in randomized complete block design with four replications. The above said