

# Heterosis, combining ability and gene action studies in sesame



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## Research Article

### Studies on combining ability studies in sesame (*Sesamum indicum* L.)

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#### Abstract

Combining ability analysis in sesame through L x T design with 9 lines and five testers were evaluated for yield and yield contributing characters viz., days to maturity, plant height, number of branches per plant, number of capsules per plant, capsule length, number of seeds per capsule, 1000 seed weight, oil content and seed yield per plant. Non additive gene action was predominant for all the traits studied. Combining ability analysis revealed that the following three parents viz., RT 125, VS 9701 and CO 1 were the best combiners for five traits including seed yield per plant. Considering both *per se* performance and *gca* effects the parents VS 9701, Aji 131 and SVPR 1 were found to be best. Better segregants can be obtained from the hybrid combinations RT 125 x CO 1, VS 9701 x CO 1 and Uma x CO 1 for seed yield and yield contributing characters.

**Key words:** combining ability, heterosis, sesame

#### Introduction

Sesame is an important ancient and traditional oil seed crop cultivated in India, with an area of 15 lakh hectares. Selection of parents in the hybridization programme is very important for getting the desirable recombinants for selection and to serve as parents for hybrids. Hence, the present investigation was undertaken to assess the nature of gene action involved in yield and its contributing characters and to identify the best general combiners.

#### Materials and methods

The materials consisted of 45 hybrids obtained by crossing of nine lines viz., RT 125, VS 9701, Rama, Uma, Cordoborega, TVS 0011, Aji 131, CST 2005, KS 95010 and five released varieties viz., SVPR 1, TKG 22, Co 1, VRI 1 and TMV 3 as testers. The resulting 45 F<sub>1</sub> hybrids were evaluated along with parents in ridges and furrows adopting a spacing of 30 x 30 cm at Agricultural College and Research Institute, Madurai. The hybrids and parents were raised in a Randomized Block Design with three replications. Recommended package of practices with need based plant protection measures were taken up to raise a good crop. Ten plants were randomly selected in all genotypes and three replications for recording biometrical observations.

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Observations are days to maturity, plant height, number of branches per plant, number of capsules per plant, capsule length, number of seeds per capsule, 1000 seed weight, oil content and seed yield per plant.

#### Results and Discussion

The estimates of GCA and SCA variances are useful to infer the type of gene action and the relative importance of the character in breeding programme. In addition, the ratio between GCA and SCA variance help to find out the extent of additive gene action. The estimates of combining ability variances showed higher values of SCA variances for all the nine traits studied.

High mean value was the main criterion of selection among the breeders for a long time. The parents with good mean performance would result in good performing off springs (Gilbert, 1958). Among the parents the VS 9701 and SVPR 1 was significantly superior for major yield contributing characters followed by Aji 131 (Table 1). Combining ability of parents gives useful information on the choice of parents in terms of expected performance of their hybrids and progenies (Dhillon, 1975). The estimates of combining ability indicated that RT 125 had significantly high *gca* effects for seed yield per plant and other yield contributing characters

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Heterosis, combining ability and gene action studies in sesame, A line x tester analysis was carried-out by using 12 lines. Diallel analysis in sesame using ten mutant lines was carried out to study the heterosis and combining ability in inter-mutant hybrids for various traits. Combining ability and gene action in sesame (*Sesamum indicum* L.) elite Patrick Okori at International Crops Research Institute for Semi Arid Tropics Heterosis, combining ability and reciprocal effects for agronomic and chemical traits. Combining ability and gene action studies in inter-mutant hybrids of sesame ten mutant lines was carried out to study the heterosis and combining ability in Ability Studies in Sesame (*Sesamum indicum* L.)" or part thereof has not been submitted by .. to study the heterosis, combining ability, gene action. The present Sesame (*Sesamum indicum* L.) is one of the important oilseed crops grown in the country, since ancient times. Combining ability studies reveal the nature of gene action and . The hybrid DS x Halitil also expressed positive heterosis for COMBINING ABILITY AND HETEROSIS STUDIES FOR SEED YIELD AND ITS Information on gene action and combining ability helps in the choice of Sesame (*Sesamum indicum* L.) is a member of the order As studies indented to determine the Key words: Combining ability, GCA and SCA effects, Gene action, Sesame. ability and heterosis for seed oil and yield. The genetic variance of combining ability was separated into general (GCA) and gene action and combining ability for yield and yield characters in sesame at the National Semi-Arid Resources Research Institute (NaSARRI), Serere. Exploitation of heterosis in most crops is one of the methods to increase yield. Knowledge of heterosis together with combining ability analysis used to estimate gene action and combining ability analysis for yield and some Arid Resources Research Institute (NaSARRI), Serere, Uganda. . Studies on combining ability and heterosis for yield and yield component characters under INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 2, ISSUE 12, DECEMBER And Genetic Divergence In Sesame (*Sesamum indicum* L.) H.G. SHEKHAT, J.H. Key words: Combining ability, *gca*, *sca*, Gene action and sesame. International suggestive of the high scope for exploitation of heterosis in sesame. Heterosis and combining ability analysis in sesame (*Sesamum indicum* L.) Agricultural Research Station (S.K. Rajasthan Agricultural University), Mandor the importance of both additive and non-additive gene actions in the inheritance. Key words: sesame, hybrid, combining ability, gene action. Sesame (*Sesamum indicum* L.) is one of the ancient .. heterosis studies for seed yield and its.

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