



Exploitation of heterosis breeding through diallel matting in Indian mustard [*Brassica juncea* (L.) Czern and Coss]

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Abstract : Six parents viz., BPR 380-1, RSK 28, RH(OE)0103, SKM 532, GM 3 and GM 1 were crossed in diallel fashion (excluding reciprocals) in Indian mustard. Fifteen F_1 crosses of Indian mustard [*Brassica juncea* (L.) Czern and Coss] were studied to investigate mid parent, better parent and standard heterosis over check variety GM 2 for seed yield and its component traits. The analysis of variance for various characters revealed that the considerable genetic variation existed among the parents and hybrids for all the traits under study. The standard heterosis for seed yield and its components traits revealed that the highest standard heterosis for seed yield was observed in RSK 28 x RH(OE)0103 (32.3%) followed by GM 3 x GM 1 (25.53%). Amongst these hybrids, the SKM 532 x GM 1 was heterotic over GM 2 for various yield components, whereas, the hybrids RSK 28 x GM 1 and BPR 380-1 were also heterotic for main branch length and siliquae per plant.

Key Words : Heterosis, Heterobeltiosis, Indian mustard

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INTRODUCTION

The diallel analysis helps breeder to predict the utility of F_1 hybrids and its behavior in subsequent generation. Heterosis breeding could be potential alternative for achieving quantum jumps in production and productivity. The magnitude of heterosis particularly for seed yield is of paramount importance and if the heterosis feasible it can help to reach high yield levels.

MATERIALS AND METHODS

The resulting 15 hybrids and six parents were grown in Randomized Block Design with three replications at Main Castor-Mustard Research Station, S.D. Agricultural University, Sardarkrushinagar in Rabi 2009-10. The experiments involved 4 m long single row plots. The rows were 45 cm apart with distance between plants within rows being 15 cm. Observations were recorded on five random plants within a row for the characters viz., days to 50 per cent flowering, days

to maturity, plant height, main branch length, number of branches per plant, siliquae per plant, number of siliquae on main branch, seed yield per plant and 1000 seed weight.

RESULTS AND DISCUSSION

The analysis of variance for parents, hybrids and parents vs. hybrids computed for different characters under study is presented in Table 1. The results revealed highly significant differences due to genotype for all the characters indicating sufficient genetic variability present in the materials for all the characters under study. The variance due to genotype was further partitioned into parents, hybrids and parent vs. hybrids for all the traits significant difference due to parents and hybrids were found for all the characters. Whereas, parents vs. hybrids was significant for all most characters except plant height, siliquae on main branch, siliquae per plant and seed yield per plant. This indicated existence of considerable amount of genetic variability among parents and hybrids for

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