International Journal of Agricultural Sciences
Volume **10** | Issue 1| January, 2014 | 102-107

RESEARCH PAPER

Heterosis and combining ability analysis in Indian mustard, *Brassica juncea* (L.) Czern & Coss

V.K. DHOLU[1], N. SASIDHARAN*, K. SUTHAR[1], B. BHUSAN[1] AND J.N. PATEL[1]
Department of Agricultural Botany, B.A. College of Agriculture, Anand Agricultural University, ANAND (GUJARAT) INDIA (Email : sasidharanneetiyath@gmail.com)

Abstract : Heterosis and combining ability were studied in 8 x 8 diallel set of Indian mustard [*Brassica juncea* (L.) Czern & Coss]. Analysis of variance for combining ability revealed the presence of genetic variability due to gca among the parents and due to sca among the crosses for all the traits. The σ^2gca and σ^2sca ratio indicated that non-additive gene action was predominant for the inheritance of all the traits except days to 50% flowering, plant height, length of siliquae, seeds per siliquae and 1000 seed weight for which additive gene action was more important. Parents GM-2 and IC-560696 were good general combiners for seed yield per plant and its related attributes. On the basis of *per se* performance and estimates of heterosis hybrids, IC-491446 x IC-560696, IC-560696 x Vardan and Laxmi x GM-2 were found to be most promising for seed yield and other desirable traits, hence, could be further evaluated to exploit the heterosis or utilized in future breeding programme to obtain desirable segregants for the development of superior genotypes. The maximum positive significant heterosis over better parent for seed yield was observed in the hybrids IC-491446 x IC-560696 (45.31%) Laxmi x GM-2 (41.93%) and IC-560696 x Vardan (16.37%). The gca and sca mean squares were significant for aphid resistance. The dominance ratio (σ^2gca/σ^2sca**)** indicated the preponderance of non-additive gene effects for the inheritance of aphid resistance. The estimates of general combining ability suggested that parents GM-1 and GM-3 were good general combiner for aphid resistance. The estimates of specific combining ability effects revealed that the cross combinations *viz.*, IC-491446 x GM-2, IC-560696 x Vardan, IC-491446 x GM-1, Laxmi x Vardan and Laxmi x IC-560696 were observed to be most promising for aphid resistance. The morphological characters of plant *viz.*, siliquae per plant, seeds per siliquae and yield per plant were negatively correlated with the peak aphid population. The oil content was negatively correlated with peak aphid population while, protein content was positively correlated with peak aphid population.

Key Words : Heterosis, Combining ability, Diallel, Gca effect, Sca effect, Indian mustard

View Point Article : Dholu, V.K., Sasidharan, N., Suthar, K., Bhusan, B. and Patel, J.N. (2014). Heterosis and combining ability analysis in Indian mustard, *Brassica juncea* (L.) Czern & Coss. *Internat. J. agric. Sci.*, **10** (1): 102-107.

Article History : Received : 06.03.2013**; Revised :** 24.09.2013**; Accepted :** 19.10.2013

*** Author for correspondence**
[1]Department of Genetics and Plant Breeding, B.A. College of Agriculture, Anand Agricultural University, ANAND (GUJARAT) INDIA