Indian J. Genet., **54** (3): 315–316 (1994)

TRIPLE TEST CROSS ANALYSIS FOR OIL CONTENT, SEED YIELD AND COMPONENT TRAITS IN INDIAN MUSTARD

RAM BHAJAN, Y. S. CHAUHAN AND KAMLESH KUMAR

Department of Genetics and Plant Breeding, N. D. University of Agriculture and Technology, Kumarganj, Faizabad 224229

(Received: July 23, 1993; accepted: September 3, 1994)

To study the relative magnitude of epistasis in comparison to additive and dominance components in Indian mustard (*Brassica juncea*), the experimental materials were generated following TTC design [1]. The three testers, DIRA 313, RW 29-6, and their F_1 were crossed with ten promising strains i.e. JGM 88-11, KBJ 3, PR 8801, PSR 1, RMH 11, RN 50, RLC 8662, HLBJ 11, BM 35-9-9 and DIR 412, selected on the basis of their diverse genetic origin. The resulting 20 single and 10 three-way crosses along with ten lines and three testers were grown in randomized block design with three replications.

Significant variance due to L1i + L2i – 2L3i showed presence of epistasis for all the characters under study (Table 1). Partitioning of total epistasis revealed that both [i] and [j+l] types of epistasis were involved in the expression of plant height and seed yield/plant. Only [i] type epistasis was detected for primary and secondary branches/plant, whereas [j+l] component of epistasis was involved in the expression of length of main raceme, test weight and oil content. The presence of epistasis as observed in this study is in agreement with earlier reports [1, 2].

Analysis of variance for sums (L1i + L2i) and differences (L1i–L2i) showed significant mean squares due to both these components for plant height, test weight, seed yield/plant and oil content. This indicates the importance of D as well as H variances for these characters. For length of main raceme and secondary branches/plant, D and H components, respectively were important. The correlation between sums and differences was nonsignificant for all the characters except primary branches/plant ($r = 0.75$). This indicated that alleles with increasing and decreasing effects were equally important in contributing towards dominance for most of the characters.

These findings indicate that progress through selection could be expected in the improvement of plant height, length of main raceme, test weight and oil content, even in

Table 1. Analysis of variance (MS) for epistasis for various quantitative traits in Indian mustard

Source	d.f.	Plant height	Length of main raceme	Primary branches per plant	Secondary branches per plant	Test weight	Seed yield per plant	Oil content
[i]	1	6196.1**	209.5	104.5**	500.5**	0.32	82.6**	5.04
[j + l]	9	1369.3**	914.8**	1.0	19.7	2.64**	16.0**	9.55**
Total epistasis	10	1846.5**	844.3**	113.6**	67.8*	2.41**	22.6**	9.10**
[i] x replication	2	373.6	78.3	2.2	5.4	0.75	1.0	1.61
[j + l] x replication	18	213.4	45.5	4.7	14.1	0.65	4.6	1.71
Total epistasis x replication	20	229.4	48.8	4.4	13.2	0.66	4.3	1.70

*,**Significant at 5 and 1% levels, respectively.

the early stages of the breeding programme. Selection could as well be effective for seed yield/plant, primary branches/plant and secondary branches/plant, if it is delayed to later generations to capitalize upon fixable genetic variability existing in the form *i*.

REFERENCES

1. J. N. Sachan and Basudeo Singh. 1986. Linked epistasis for six quantitative traits in Indian mustard (*Brassica juncea* L. Czern & Coss). Theor. Appl. Genet., **71**: 644–647.

2. I. J. Anand and W. R. Reddy. 1987. Estimates of gene effects for seed yield and its components in Indian x exotic mustard. J. Oilseeds Res., **4**: 1–8.