

Assessment of germplasm resources in Indian mustard

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The experimental material comprising of one hundred (including three checks Varuna, Rohini and Maya) germplasm accessions of Indian mustard (*Brassica juncea* L.) were sown in augmented block design during Rabi 2008-09 at Regional Research Station, Saini, Kaushambi of C.S.A. University of Agriculture and Technology. In the present study, an attempt has been made to identify the genetically diverse germplasm and further utilization in the crop improvement to develop broad based cultivars. Result shows that variation in plant growth was prominently seen among the accessions as indicated by range of variability, mean performance and coefficient of variation.

Key words : Indian mustard, Accessions, Augumented block design

INTRODUCTION

Oilseeds constitute major part in agricultural crops next to the food grains in our country. Among major oilseed crops of the world, the oleiferous *Brassicaceae*, comprising rapeseed-mustard, occupies third position in production after soybean and cotton seed. In India, rapeseed-mustard ranks second after groundnut in terms of area and production. Among the various oleiferous *Brassicaceae* grown in the country, Indian mustard is the predominant crop occupying near 90% of the total area amongst other six cultivated species of *Brassicaceae* group. In spite of various utilities and a sizeable area under oilseed crops, Indian mustard has low yield potential. The low yielding ability can be considerably increase by use of high yielding varieties/hybrid which in turn serve as potential donors for various quantitative and qualitative traits. The identification, classification and documentations of species and cultivars help in studying of genetic and breeding behaviors of plants. Efficient utilization of germplasm would benefit programmes aimed at producing new improved cultivars from adapted germplasm by providing potential sources of different traits. In the present study, an attempt has been made to identify the genetically diverse germplasm and further utilization in the crop improvement to develop broad based cultivars.

MATERIALS AND METHODS

The experimental material comprising one hundred (including three checks Varuna, Rohini and Maya) germplasm accessions of Indian mustard (*Brassica juncea* L.) were sown in augmented block design during

Rabi 2008-09 at Regional Research Station, Saini, Kaushambi of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur. Each accession was grown in two rows of 5m length with row to row distance of 30cm and plant to plant distance of 15-20cm was maintained by thinning. Plot basis observations were recorded on days to 50% flowering and days to maturity whereas plant height (cm), number of primary branches per plant, number of secondary branches per plant, length of main raceme (cm), number of siliquae on main raceme, number of seeds per siliqua, 1000 seed weight (g), seed yield per plant (g) and oil content (%) were observed on the basis of 5 randomly selected plants at appropriate growth stage of crop. Due care was taken while selecting 5 plants *i.e.* plants were taken from the part of the row where population was optimum. Variation in plant growth was prominently seen among the accessions. 1000 seeds were counted from the bulk yield of five plants and weighed by electronic balance. For oil content, the seeds were sun dried for 12 hours and one gram seeds were taken for estimation of oil content (%) by the help of instrument NMR (Nuclear magnetic resonance) spectro 4000. Range of variability, mean performance and coefficient of variation were computed using standard statistical methods (Gomez and Gomez, 1984).

RESULTS AND DISCUSSION

In the present study variation in plant growth was prominently seen among the accessions as indicated by range of variability, mean performance and coefficient of variation present in Table 1. The days to 50% flowering ranged from 38 days to 105 days (mean: 54.1 days) whereas values for days to maturity ranged from 116 days

Table 1: Range of variability, mean performance and coefficient of variation for 11 characters in Indian mustard

Characters	Range	Mean \pm SE	CV %	Mean value of check		
				Varuna	Rohini	Maya
Days to 50 % flowering	38.0-105.0	54.1 \pm 1.1	23.7	52	61	45
Plant height (cm)	135.3-195.0	175.9 \pm 2.3	12.6	160	185	130
No. of primary branches	4.3-7.6	6.5 \pm 0.5	10.7	6	5	5
No. of secondary branches	11.3-17.6	14.9 \pm 1.2	10.1	17	10	17
Days to maturity	116.0-145.0	130.1 \pm 0.9	0.8	126	135	120
Length of main raceme (cm)	38.6-77.6	61.3 \pm 2.2	14.4	55	72	52
No. of siliquae on main raceme	34.0-71.3	51.8 \pm 1.7	24.1	32	37	30
No. of seeds per siliqua	10.3-17.3	12.91 \pm 0.67	16.4	12	13	8
1000 seed weight (g)	3.0-5.7	4.1 \pm 0.1	15.8	5.1	4.3	4.1
Seed yield per plant(g)	17.0-29.0	22.3 \pm 0.1	39.1	24	25	19.3
Oil content (%)	36.3-40.3	39.1 \pm 0.4	1.2	40.3	40.6	40.1

to 145 days (mean: 130.1 days). Wide range of variability was observed for plant height and values ranged from 135.3cm to 195.0cm (mean: 175.9cm). The number of primary branches per plant ranged from 4.3 to 7.6 (mean: 6.5) though the variability were also observed in number of secondary branches per plant where values ranged from 11.3 to 17.6 (mean: 14.9). Length of main raceme ranged from 38.6cm to 77.6cm (mean: 61.3cm) and number of siliquae on main raceme ranged from 34.0 to 71.3 (mean: 51.8). Range of variability has been also observed for number of seeds per siliqua 10.3 to 17.3 (mean: 12.9). 1000 seed weight ranged from 3.0g to 5.7g (mean: 4.1g). Large amount of variability was found for seed yield per plant ranged from 17.0g to 29.0g (mean: 22.3g). In case of oil content the values ranged from 36.3% to 40.3% (mean: 39.1%).

The highest variability was observed in seed yield per plant (CV 39.1 %) followed by number of siliquae on main raceme (CV 24.1 %). Days to maturity and oil content had the lowest variability (CV 0.8 %) and (CV 1.2 %, respectively). On the basis of coefficient of variation the characters that have highest (CV>35 %) was recorded for seed yield per plant (CV 39.1 %), while moderate (CV 20-35 %) were observed for number of siliquae on main raceme (CV 24.1 %) and days to 50% flowering (CV 23.7 %), however, lower coefficient of

variations were recorded (CV<20 %) for number of seeds per siliqua (CV 16.4 %) followed by 1000 seed weight (CV 15.8 %), length of main raceme (CV 14.4 %), plant height (CV 12.6 %), number of primary branches per plant (CV 10.7 %), number of secondary branches per plant (CV 10.1 %), oil content (CV 1.2 %) and days to maturity (CV 0.8 %). Similar findings were also reported by Misra *et al.* (2007). Hence, with the existing such a great extent of variability in the germplasm set, studies clearly indicate there are the ample opportunities for breeder to utilize successfully in breeding programme.

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