

Research
Paper

Heritability and genetic advance for yield and quality traits in Indian mustard [*Brassica juncea* (L.) Czern and Coss]

P.J. PATEL AND S.R. VYAS

See end of the paper for authors' affiliations

Correspondence to :

P.J. PATEL

Main Castor Mustard
Research Station (S.D.A.U.),
SARDARKRUSHINAGAR
(GUJARAT) INDIA

ABSTRACT

Heritability and genetic advance were studied under generation mean analysis, using three high yielding varieties viz., GM 1, GM 2 and GM 3 and two '0' and/or '00' quality genotypes NUDH YJ 3 and EC 278811 over two environments created by two date of sowing. High heritability (broad sense) associated with moderate to high genetic advance recorded for 1000-seed weight, seed yield per plant, harvest index, palmitic acid, stearic acid, oleic acid, linoleic acid, linolenic and erucic acid contents, suggested that these traits can be further improved through selection in segregating generations. Moderate to high heritability alongwith low genetic advance were observed for days to maturity, days to flowering and oil content suggested that very remote possibilities of improving these traits through straight selection, hence *inter se* crossing of desirable recombinants keeping adequate population size would be beneficial.

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KEY WORDS : *Brassica*, Heritability, Genetic advance and Indian mustard

Indian mustard [*Brassica juncea* (L.) Czern and Coss] is the most important oilseeds crop occupying a prominent position in Indian oilseeds scenario with a vital role in oilseed economy of the country. Extensive breeding work for evolving new and better varieties in Indian mustard is in progress for decades and consequently a number of high yielding varieties are in cultivation. Most of the quantitative characters are controlled by polygene, which are influenced by the environment. Hence, it is essential to partition the overall variability into heritable and non-heritable components with the help of heritability and genetic advance.

RESEARCH PROCEDURE

Under generation mean analysis, three high yielding varieties viz., GM 1, GM 2 and GM 3 and two '0' and / or '00' quality genotypes viz., NUDH YJ 3 and EC 287711 were crossed and four hybrids viz., GM 1 x NUDH YJ 3, GM 2 x EC 287711, GM 3 x NUDH YJ 3 and GM 3 x EC 287711 developed at Main Castor and Mustard Research Station, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar by hand crossing using standard technique during *Rabi* 2004-2005, these hybrids were sown in 2005-06 selfed and backcrossed to obtain their F_2 , BC_1 and BC_2 generations. The entire

experimental material comprised of six generations viz., P_1 , P_2 , F_1 , F_2 , BC_1 and BC_2 for each of the four crosses. All the crosses along with their parents *i.e.*, all six generations were grown in the Compact Family Block Design with three replications in two different environments created by two date of sowing (timely and late sown) during *Rabi* 2006-07. Each net plot had one row for parents and F_1 , two rows for each of the BC_1 and BC_2 generations and four rows for F_2 generation. Each row consisted of 15 plants with row to row and plant to plant spacing being 45 and 15 cm, respectively. The recommended agronomic practices were followed to raise the crop. Data for various quantitative characters were recorded on five randomly selected competitive plants for each generation in every replication pertaining to yield and yield components. The oil content was estimated (per cent) through nuclear magnetic resonance technique (NMRT) from the samples. Fatty acid profiles of the oil were determined in percentage by GAS liquid chromatography. The broad sense heritability and genetic advance was calculated by the formulae suggested by Allard (1960).

RESEARCH ANALYSIS AND REASONING

High heritability (broad sense) coupled with high