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Genetic correlation and causation among earliness characters in sesame (*Sesamum indicum* L.)

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SUMMARY

The objective of this investigation was to study the genetic correlation and causation among nine earliness traits of six desirable lines crossed in a diallel fashion, using the method given by Johnston *et al*., (1955) and Dewey and Lu (1959). Studies on genetic correlation and causation in parents alone and parents plus hybrids revealed the superiority of height of first flowering node in earliness breeding programme. Among the eight independent variables, it contributed maximum positive direct effect towards days to 50 per cent flowering and through these traits only six out of the seven traits exerted their maximum positive indirect effect towards days to 50 per cent flowering. On the other hand, the studies on genetic correlation and causation in hybrids alone portrayed the superiority of height of first fruiting node in earliness breeding programme. Among the eight independent variables, it contributed maximum positive direct effect towards days to 50 per cent flowering and through these traits only five out of the seven traits exerted their maximum positive indirect effect towards days to 50 per cent flowering.

Key words: Sesamum, Earliness, Correlation, Path coefficient.

Earliness is one of the important attributes, but a highly complex character influenced by a large number of component characters. Hence, information on the strength and direction of association of these component traits with days to 50 per cent flowering, seed yield, oil content and among themselves will be very useful in formulating an effective breeding program for the improvement of sesame crop. Dewey and Lu (1959) has stated that correlation simply measures mutual association without regard to causation, while path coefficient analysis specifies the cause measures their relative importance. Therefore the present study was undertaken to find out the genetic correlation and causation among earliness related traits.

MATERIALS AND METHODS

Six diverse sesame genotypes were mated in a 6 x 6 full diallel cross resulting in 30 F_1's. These hybrids along with their parents were grown in a randomized block design. Each experimental plot consisted of a single row of 4.5 cm length. The inter and intra-row spacings were maintained at 30 and 15 cm respectively. The data were recorded on five randomly selected competing plants per entry per replication. The genetic correlation coefficients for all character combinations were computed following Johnston *et al*. (1955), Al-Jibouri *et al*. (1958). The procedure suggested by Dewey and Lu (1959) was used to arrive at path coefficients. Correlations and path coefficients were computed separately for parents, hybrids and parents plus hybrids.

RESULTS AND DISCUSSION

The results obtained from the analysis of parents alone are represented below. The seed yield exhibited positive significant genetic association with number of first flowering node, height of first flowering and fruiting node, days to 50 per cent flowering and maturity and thousand seed weight. The inter correlation among these traits were positive and significant except thousand seed weight, which showed non-significant association (Table 1). The positive and high correlation of seed yield with height of first fruiting node was earlier reported by Bakheit and Mahdy (1988).

Path analysis was done by keeping days to 50 per cent flowering as dependent variable and keeping all other characters as independent variables (Table 2).

Height of first flowering node exerted maximum positive direct effect towards days to 50 per cent flowering followed by days to 50 per cent maturity and number of first flowering node. Thousand seed weight witnessed maximum negative direct effect followed by number of first fruiting node and height of first fruiting node.

Number of first flowering node exhibited maximum positive indirect effect through height of first flowering node followed by days to 50 per cent maturity. It showed maximum negative indirect effect through number of first fruiting node followed by thousand seed weight.

Number of first fruiting node evinced maximum positive indirect effect via height of first flowering node followed by number of first flowering node and days to 50 per cent maturity. It exhibited maximum negative indirect effect via height of first fruiting node followed by thousand seed weight. Height of first flowering node exhibited maximum positive indirect effect through days to 50 per cent maturity by number of first flowering node, and seed yield per plant. It evidenced maximum negative indirect