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TRAIT ASSOCIATION STUDIES FOR YIELD AND YIELD CONTRIBUTING TRAITS IN SESAME (*Sesamum indicum* L.)

A. MANASA*, D. BHARATHI, M. SHANTHI PRIYA AND P. LAVANYA KUMARI

Department of Genetics and Plant Breeding, S.V. Agricultural College, ANGRAU, Tirupati-517 502.

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ABSTRACT

A field study was undertaken at Regional Agricultural Research Station, Tirupati during *rabi* 2022-23 to know the association among yield and its component traits in sesame. Forty three sesame genotypes were evaluated for important quantitative traits such as days to 50 per cent flowering, plant height, number of primary branches per plant, number of capsules per plant, capsule length, number of seeds per capsule, 1000 seed weight and seed yield per plant. Character association analysis revealed strong positive association of seed yield per plant with days to 50% flowering, number of primary branches per plant and number of capsules per plant.

KEYWORDS: Sesamum, Seed yield, Character association.

INTRODUCTION

Sesame (*Sesamum indicum* L., 2n = 26) is the most important ancient oilseed crop and belongs to the family Pedaliaceae. It is also known as 'queen of oil seeds' as the seeds are rich source of proteins, vitamins, minerals, amino acids and antioxidants such as sesamin and sesamolin. Oil content in sesame is highest compared to other oil seed crops like groundnut, soybean, mustard and it has the important properties like pleasant flavor, resistance to oxidative deterioration and high unsaturated fatty acid content and can be used as active ingredient in antiseptics, bactericides, viricides and disinfectants etc (Pusadkar *et al*., 2015).

Globally, sesame is cultivated in an area of 117.4 lakh hectares with a production of 60.1 lakh tons and a productivity of 511 kg/ha (FAOSTAT, 2020). India ranks first in area (46.5%) under sesame cultivation and stands at the second place in terms of production in world after China. But, the productivity of sesame in India is very low (432 kg ha^{-1}) compared to China (1382 kg ha^{-1}). Hence, it is imperative to develop high yielding varieties with increased productivity to sustain the sesame cultivation. For successful crop improvement programme, it is important to assess the degree of association between yield and it`s component characters. Information about association of various yield components can be obtained through correlation analysis. Hence correlation will provides a better idea of nature of association among the characters towards the improvement of yield.

MATERIAL AND METHODS

All the 43 genotypes were raised in a randomized block design with three replications in Regional Agricultural Research Station, Tirupati during *rabi*, 2022-23. Each genotype was sown in three rows of 3 meter length. A spacing of 30 cm between rows and 15 cm between plants was adopted. Recommended package of practices with need based plant protection measures were taken up to raise a good crop. Observations were recorded on each entry on five randomly selected plants for yield attributing characters *viz.,* plant height (cm), number of primary branches per plant, number of capsules per plant, capsule length (cm), number of seeds per capsule, thousand seed weight (g), and seed yield per plant (g) while days to 50% flowering which is recorded per plot basis. Genotypic and phenotypic correlation coefficients were calculated as per (Al-Jibouri *et al*., 1958).

RESULTS AND DISCUSSION

The phenotypic and genotypic correlations among the yield and yield component characters in sesame was calculated to know the nature of association among the characters are presented in Table 1. Seed yield per plant was found to be significant and positively associated with days to 50% flowering (r_g=0.479**; r_p= 0.180*), number of capsules per plant (r_g=0.279**; r_p=0.227**). These results are in concurrence with earlier findings (Rao *et al*., 2013).

*Corresponding author, E-mail: manasaamidala889@gmail.com

Table 1. Phenotypic (r_p) and Genotypic (r_g) correlation coefficients between seed yield and yield contributing traits in sesame

		Days to 50% flowering	Plant height	No. of Primary branches/plant	No. of capsules/plant	Capsule length	No. of seeds/capsule	1000 seed weight	Seed yield/plant
Days to 50% flowering	r_g	1	0.514**	0.504**	0.261**	-0.715**	-0.459**	0.004	0.479**
	r_p	1	0.178*	0.262**	0.106	-0.349**	-0.223*	0.001	0.180*
Plant height	r_g		1	0.302**	0.606**	-0.102	-0.468**	-0.177*	-0.009
	r_p		1	0.295**	0.552**	-0.051	-0.046	0.037	0.033
No. of primary branches/plant	r_g			1	0.262**	-0.241**	-0.075	-0.351**	0.184*
	r_p			1	0.316**	-0.111	0.060	-0.142	0.199*
No. of capsules/plant	r_g				1	-0.334**	-0.406**	-0.250**	0.279**
	r_p				1	-0.206*	-0.144	-0.083	0.227**
Capsule length	r_g					1	0.550**	0.371**	-0.345**
	r_p					1	0.309**	0.206*	-0.203*
No. of seeds/capsule	r_g						1	-0.197*	0.031
	r_p						1	-0.090	0.018
1000 seed weight	r_g							1	-0.053
	r_p							1	-0.051
Seed yield/plant	r_g								1
	r_p								1

*Significant at 5% Level
**Significant at 5% and 1% Level

Among inter-correlations, between the yield component characters revealed, days to 50% flowering had significant positive association with plant height (r_g=0.514**; r_p=0.178*) (Kehie *et al*., 2020) and number of primary branches per plant (r_g=0.504**; r_p=0.262**). Plant height had significant and positive association with number of capsules per plant (r_g=0.606**; r_p=0.552**) number of primary branches per plant (r_g=0.302**; r_p=0.295**) (Sasipriya *et al*., 2022). Number of primary branches per plant had significant and positive association with number of capsules per plant (r_g=0.262**; r_p=0.316**) (Anitha *et al*., 2010). Capsule length had significant and positive association with number of seeds per capsule (r_g=0.550**; r_p=0.309**) and 1000 seed weight (r_g=0.371**; r_p=0.206*).

Seed yield had significant negative association with capsule length (r_g=-0.345**; r_p=-0.203*). Days to 50% flowering had significant negative association with capsule length (r_g=-0.715**; r_p=-0.349**) and number of seeds per capsule (r_g=-0.459**; r_p=-0.223*). Number of capsules per plant had significant negative association with capsule length (r_g=-0.334**; r_p=-0.206*).

Based on the results of correlation, genotypes with days to 50% flowering and number of capsules per plant should be given prime importance, while selecting the sesame genotypes for improvement of yield.

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