

**Research Notes****Correlation and path analysis for seed yield in sesame (*Sesamum indicum* L.)**

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**Abstract**

Character association was studied to assess the relationship among yield and its components for selection criteria to be followed while developing varieties. Correlation and path analysis of 45 hybrids and 14 parents for the characters, Days to maturity, plant height, number of branches per plant, number of capsules per plant capsule length, number of seeds per capsule, Thousand seed weight, oil content and seed yield per plant. Character association analysis revealed strong positive association of seed yield per plant with number of branches and number of capsules per plant. Path coefficient analysis revealed that number of branches and number of capsules per plant had high positive direct effect on seed yield per plant. Hence number of branches and number of capsules per plant may be good selection criteria for seed yield per plant

**Key Words:** Sesamum, Seed yield, Character association, Path analysis

Sesame (*Sesamum indicum* L.) is one of the ancient and traditional oilseed crops cultivated in India, for its quality oil. Yield is a poly genically controlled character and highly influenced by the environment. Selection merely based on yield is not effective. Selection based on its components increases yield as they are not only less complex but also relatively simply inherited and are much less influenced due to environmental deviations. Path co-efficient analysis provides an efficient means of partitioning of correlation co-efficient into direct and indirect effects of the component characters. Selection on the basis of direct and indirect effects is much more useful than selection for yield *per se* alone.

The 45 hybrids obtained by crossing nine lines and five testers were raised in a randomized block design with three replications replicated thrice in Agricultural college and research Institute, Madurai. The 14 parents were also raised in an adjacent plot with three replications. Each parent and hybrid was sown in two rows of 3 metre length. A spacing of

30 cm between rows and 30 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 ten randomly selected plants for yield attributing characters *viz.*, days to maturity, plant height(cm), number of branches per plant, number of capsules per plant, capsule length(cm), number of seeds per capsule, Thousand seed weight(g), oil content (%) and seed yield (g). Genotypic and phenotypic correlation coefficients were calculated as per Miller *et al.*(1958). The direct and indirect contribution of various characters to yield were calculated through Path coefficient analysis by Dewey and Lu (1959).

The phenotypic and genotypic correlations among the yield and yield component characters in sesame are presented in Table 1. The genotypic correlation were greater than phenotypic correlation in all the traits except 1000 seed weight. Seed yield per plant was found to be significant and positively associated number of branches and capsules per plant (Kumaresan and Nadarajan 2002 and Deepa Sankar and Ananda Kumar, 2003). The study of inter-character association between the yield component characters revealed significant and positive association of days to maturity with plant height and

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number of branches per plant. Plant height had significant and positive association with number of branches per plant and number of capsules per plant. Regarding the number of branches per plant it was positively associated with number of capsules per plant in accordance with Deepa Sankar and Ananda Kumar (2003). The number of branches per plant had significant and negative association with 1000 seed weight and oil content. Contrary to this, positively significant association of number of branches per plant with 1000 seed weight and oil content was reported by Kumaresan and Nadarajan (2002).

Negatively significant association of capsule length with oil content was observed contrary to Ashoka Vardhana Reddy *et al.* (2001). From the above discussion, it may be concluded that an intense selection in the positive side for number of branches per plant and number of capsules per plant will improve seed yield since these traits expressed significant and positive correlation among themselves and with seed yield per plant.

Partitioning of the total correlation coefficient into direct and indirect effects for seed yield per plant showed, number of branches per plant (Ganesh and Sakila, 1999). and number of capsules per plant (Deepa Sankar and Ananda Kumar, 2003) had high positive direct effect (Table 2.). The character 1000-seed weight and Oil content also recorded positive direct effect. Other traits had low, negative and negligible direct effects. The indirect effects of characters namely plant height through number of branches per plant and number of capsules per plant was positive and high. The indirect effects of characters viz., number of branches per plant through number of capsules per plant was positive and moderate. Thousand seed weight had negative and moderate indirect effects through number of branches per plant and number of capsules per plant. Contrary to this, positive and high indirect effects were observed by Deepa Sankar and Ananda Kumar (2003). Hence selection based on these traits would be effective increasing yield. Hence, number of branches per plant and number of capsules per plant had high direct effects on seed yield. The indirect effects of number of branches per plant through number of capsules per plant and *vice versa* were also positive. Therefore, number of branches per plant and number of capsules per plant should be given importance in the selection programme to get high seed yield in sesame.

## References

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**Table 1. Phenotypic (P) and Genotypic (G) correlation coefficients between seed yield and different traits in sesame**

Characters	Days to maturity	Plant height	Number of branches per plant	Number of capsules per plant	Capsule length	Number of seeds per capsule	1000 seed weight	Oil content	Seed yield per plant
Days to maturity	P	0.46*	0.29*	-0.11	-0.05	-0.17	0.18	0.15	-0.07
	G	0.50*	0.33*	-0.11	-0.04	-0.18	0.21	0.15	-0.08
Plant height	P		0.46*	0.33*	0.01	-0.11	0.11	-0.14	0.24
	G		0.57*	0.37*	0.04	-0.13	0.13	-0.17	0.26
Number of branches per plant	P			0.27*	0.09	0.05	-0.31*	-0.34*	0.32*
	G			0.29*	0.10	-0.04	-0.41*	-0.40*	0.38*
Number of capsules per plant	P				0.03	-0.14	0.07	-0.26	0.85*
	G				0.03	-0.14	0.08	-0.26	0.86*
Capsule length	P					0.10	0.06	-0.21	-0.11
	G					0.13	0.02	-0.28*	-0.16
Number of seeds per capsule	P						-0.18	0.03	-0.04
	G						-0.18	0.03	-0.07
1000 seed weight	P							0.15	0.02
	G							0.18	0.002
Oil content	P								-0.20
	G								-0.21

\*Significant at 5% Level

**Table 2. Direct and indirect effects of different characters on seed yield in sesame**

Characters	Days to maturity	Plant height	Number of branches per plant	Number of capsules per plant	Capsule length	Number of seeds per capsule	1000 seed weight	Oil content	Genotypic correlation with Seed yield per plant
Days to maturity	<b>-0.089</b>	-0.140	0.171	-0.097	0.014	-0.017	0.036	0.037	-0.08
Plant height	-0.045	<b>-0.282</b>	0.295	0.330	-0.012	-0.011	0.023	-0.042	0.26
Number of branches per plant	-0.030	-0.105	<b>0.516</b>	0.258	-0.034	-0.003	-0.072	-0.100	0.38*
Number of capsules per plant	0.011	-0.010	0.151	<b>0.882</b>	-0.009	-0.013	0.015	-0.065	0.86*
Capsule length	0.004	-0.010	0.055	0.026	<b>-0.321</b>	0.012	0.004	0.070	-0.16
Number of seeds per capsule	0.015	0.036	-0.020	-0.124	-0.040	<b>0.092</b>	-0.031	0.006	-0.07
1000 seed weight	-0.017	-0.037	-0.214	0.073	-0.007	-0.016	<b>0.174</b>	0.044	0.002
Oil content	-0.012	0.047	-0.208	-0.229	-0.090	0.002	0.031	<b>0.249</b>	-0.21

Bold values are direct effects

Residual effect = 0.34