https://doi.org/10.29321/MAJ.10.A02754

Madras agric. J. 69. (9) : 561—563 September 1982

Correlation and path analysis in *Ricinus Communis* L.

AR. MUTHIAH[1] M. MANIVANNAN[2] C. NATARAJAN[3] G. A. PALANISAMY[4] and JEYARAJ[5]

Correlations and Path coefficient between seed yield and yield components were estimated in thirty five inbrids of Castor. The genotypic correlations were heigher than the phenotypic correlation. Number of nodes to main spike, length of main spike, length of female portion, number of effective spike and height of plant and significant postive correlation with yield. Path coefficient analysis revealed that length of female portion, number of nodes to main spike and height of the plant had the maximum direct effect of yield.

Yield being complex polygenic character is dependent on a number of quantitative atributes. A knowledge of the association of quantitative characters, especially of yield and its attributes, will be of immense practical value in crop breeding programme. Path coefficient analysis is a standardised partial regression coefficient, and as such measures the direct influence of one variable upon another and permits the separation of correlation coefficient into components of direct and indirect effect (Dewey and Lu, 1959). The present study was undertaken to determine the characters associated with yield and their degree of association in castor.

METERIAL AND METHODS

Thirty five inbreds of Castor with widely diversified origin were selected from the germplasm collections maintained at Castor Research Station, Pottaneri and were utilised for the study. The inbreds were grown under rainfed conditions during Kharif '80 in randomised block design replicated thrice. Five plants per replication were selected at random and obervations were recorded and subjected to statistical analysis as per Goulden (1959). The characters recorded were plant height, number of nodes to effective spike, length of female portion, number of effective spikes, 100 seed weight and yield per plant.

RESULTS AND DISCUSSION

Genotypic and penenotypic correlation between the six characters are presented in Table-1. The genotypic correlations were higher than the phenotypic correlations. It is evident from the results that grain yield was sinificantly and positively correlated with all the other characters except 100 bean weight. Yield had a strong positive true relationship with number of nodes to main spike and height of the plant. The traits, length of female portion and length of the main spike exhibited high positive and significant correlation. This is mostly in accordance with the results of Stephen Durairaj *etal.* (1973). Seed yield was positively correlated

1 and 4 Assisrant Professors (Gasror), 2 and 3—Research Associates, 5 Director of Research (Agri.) TNAU, Coimbatore-3.

with number of effective spikes and this is in accordance with the results of Hooks *et al.* (1971) who observed seed yield was positively correlated with number of racemes per plant. Giriraj *et al.* (1973) in a correlation and genetic studies in diallel crosses of Caster observed that seed yield and 100 seed weight were positively correlated with number of internodes up to primary raceme, height and length of primary raceme. In this study also the seed yield and 100 seed weight were positively correlated with number of nodes to main spike, height and length of main spike. But in the present study the positive correlation of 100 seed weight with length of main spike is statistically non-sinificant. Negative correlation was exhibited by number of effective spikes with number of nodes to main spike, length of main spike and plant height and also 100 seed weight with length of female portion and height of the plant in this study.

The path coefficient analysis (Table-2), worked out to determine the true components of yield, revealed high positive direct effects of length of female, portion, number of nodes, to main spike and height of the plant.

The residual effect was 0.6191 indicating that about 40% of the variability in yield was contributed by the six characters involved in this study. Inclusion of more variables other than the ones studied may throw more light on the direct effects contributing to yield.

The authors are thankful to the Associate Professor (Agricultural Statistics), Tamil Nadu Agricultural University, Coimbatore for computer analysis of the data.

REFERENCES

DEWEY, D. R. and K. H. LU 1959. A correlation and path coefficient analysis of component of crested wheat grass seed production *Agron. J. 51* : 515-18

GIRIRAJ, K. S. W. MENSINKAI, and S. S. SINDAGI 1973. Correlation and genetic studies in diallele crosss of castor *Ricinus communis* L). *Mysore Journal of Agrl. Sci. 7 (3)* : 385-88.

GOULDEN, C. H. 1979. Methods of statistical analysis Asia publishing House, Madras.

HOOKS, J. A. J. H WILLIAMS, and C. O GARDNER, 1971. Estimates of heterosis from a diallel cross of inbred linos of castor *(Ricinus communis* L.) *Crop. Sci. 11 (5)*: 651-55

STEPHEN DORAIRAJ, M. M. KANDASAMY S. PALANISAMY and S. VARISAI MUHAMMAD. 1973. Correlation studies in *Ricinus commnuis* L. I. Within inbreds and hybrids *Madras agric. J. 60* : 1481-85.

Table-1 Genotypic (upper line), and Phenotypic (lower line) Correlation Coefficiets between seed yield and its Components in Castor.

Characters	Seed yield per plant	Height of plant	No. of nodes to main spike	Length of main spike	Length of female portion	No. effective spike
Height of plant	0.53**					
	0.40**					
Nh. of nodes to	0.60**	0.48**				
main spike	0.28**	0.37**				
Length of main	0.33**	0.21**	0.51**			
spike	0.29**	0.11	0.25*			
Length of female	0.42**	0.11	0.49**	0.95**		
portion	0.35**	0.04	0.32**	0.90**		
No. of effective	0.22**	-0.21*	-0.25*	-0.31**	0.05	
spike	0.38**	-0.10	-0.19	0.01	0.06	
100 seed	0.11	0.31**	0.42**	0.04	-0.01	-0.64**
weight	0.09	0.29**	0.31**	0.03	-0.01	-0.33**

** Significant at one percent level. *Significant at five percent level.

Table-2 Path coefficients for seed yield and its components in castor

Characters	Height of Plant	No. of nodes to main spike	Length of main spike	Length of famle portion	No. of effective spike	100 seed weight	Total correlo-tion with seed yield
Height of plant (X1)	*+0.41*	—0.19	—0.07	+0.51	—0 06	—0.07	0.53
No. of nodes (X2) to main spike	0.20	*0.40*	—0.16	0.23	—0.07	0.01	0.60
Length of main (X3) spike	0.08	0.21	*—0.32*	0.45	—0 09	0.001	0.33
Length of (X4) female portion	0.04	0.20	—0.30	*0.47*	0.01	—0 0003	0 42
No. of effective (X5) spike	—0.09	—0.10	0.10	0.02	*0.30*	—0.01	0.22
100 seed (X6) weight	0.13	0.17	—0.01	—0.01	—0.19	*0.02*	0.11

Italic figures are direct effects.
Residual effect Px 0.6191