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VARIABILITY AND CORRELATION STUDIES IN KODOMILLET (*Paspalum scrobiculatum* L.)

S. CHIDAMBARAM, S. PALANISAMY and M.N. PRASAD

Regional Research Station, Tamil Nadu Agricultural University, Kovilangulam 626 107

ABSTRACT

Variability and correlations were studied for ten characters in Kodomillet (*Paspalum scrobiculatum* L.). High heritability and high genetic advance were observed for plant height and days to 50% bloom. Medium heritability and high genetic advance were observed for number of tillers per plant, straw weight, root weight and harvest index indicating that these characters were governed by additive variance. Total dry matter was correlated positively with root weight and straw weight and negatively with harvest index. Plant yield was positively correlated with earhead weight and harvest index suggesting that yield could be improved by selecting plants for higher harvest index and greater earhead weight.

Among various minor millets grown in Tamil Nadu, kodomillet occupies a larger area. As *varagu* is grown as a rainfed crop the seasonal climatic limitations exist. An important aspect of maximising crop productivity is the choice of cultivars or varieties whose developmental cycles are synchronised with the seasonal variations in climate. It is not possible to identify any single component as the chief cause of yield improvement. However, the yield increase could be associated with a progressive change in harvest index from low to high. A study was undertaken in kodomillet (*Paspalum scrobiculatum* L.) to study the dry matter production at the Millet Breeding Station, School of Genetics, Coimbatore. Statistical analysis was carried out according to Panse and Sukhatme (1957), heritability and genetic advance according to Robinson *et al.* (1949) and correlation according to Miller *et al.* (1958).

MATERIALS AND METHODS

Fourteen genotypes of kodomillet were selected from the germplasm collections maintained at the School of Genetics, Tamil Nadu Agricultural University, Coimbatore. They were raised in RBD plot with three replications during *rabi* 1984. Each entry was grown in six row plots with a spacing of 22.5 cm between the row and 10 cm within the row. All the agronomic practices were carried out periodically. The biometrical observations were made on ten plants for plant height, number of tillers per plant, days to 50 per cent bloom, days to harvest, root weight, straw weight, earhead weight and grain yield per plant. Harvest index was worked out of grain yield and total biomass. The mean values for the characters were subjected to statistical analysis. The analysis of variance was carried out.

Table 1. Phenotypic range, mean, phenotypic coefficient of variation (PCV) genotypic coefficient of variation (GCV), heritability and genetic advance as percentage of mean of 10 characters in kodomillet

Characters	Phenotypic range	Mean	PCV	GCV	Heritability %	Genetic Advance as % of mean
Grain yield per plant	0.72 - 3.35	0.78	46.50	12.71	4.35	23.04
Plant height	33.0 - 97.5	45.45	62.37	35.60	32.57	42.27
Number of tillers per plant	5 - 15	11.33	39.04	15.21	15.24	36.25
Days to 50% bloom	68 - 80	70.31	8.05	4.64	33.13	59.54
Days to maturity	122 - 130	126.2	2.59	1.49	33.12	17.56
Total drymatter per plant	2.00 - 7.22	2.36	50.57	14.50	4.35	23.28
Straw weight per plant	0.48 - 2.80	0.61	42.70	34.30	22.38	57.52
Earhead weight per plant	0.56 - 3.83	1.94	49.85	15.12	6.12	13.29
Root weight per plant	0.13 - 1.39	0.29	63.96	25.02	15.31	34.05
Harvest index	0.12 - 0.50	0.21	40.41	19.63	12.47	60.30

Table 2. Correlation coefficients in kodomillet

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
Y	-.2026	.3876	-.3978	-.3801	.2949	.1832	-.2183	.8465**	.5971*
X1	-	.1151	.9205**	.1571	.7237**	.2960	.8632**	-.1108	-.7809**
X2		-	.1665	.0967	.2055	.0093	.0331	.2921	-.0097
X3			-	.7814**	.6165**	.2544	.7656**	-.2054	-.7321**
X4				-	.4555	.3438	.3293	-.2644	-.5943*
X5					-	.7979**	.8207	.4149	-.7196**
X6						-	.5573**	.3130	-.8707**
X7							-	-.0168	.2111
X8								-	.2045

** P = 0.01; * P = 0.05

Y = Grain yield per plant; X1 = Plant height; X2 = Number of tillers per plant; X3= Days to 50% bloom; X4 = Days to maturity; X5 = Total dry matter production; X6 = Root weight per plant; X7 = Straw weight per plant; X8 = Earhead weight per plant; X9 = Harvest index.

RESULTS AND DISCUSSION

The results are presented in Table 1 and 2. The results show that there is a considerable variability for the characters studied. Heritability ranged from 3.13 for straw weight per plant to 33.13 for days to 50 per cent bloom. Genetic advance as percentage of mean ranged from 13.29 for straw weight per plant to 60.30 for harvest index. Heritability coupled with genetic advance may be useful for identifying the characters possessing more of additive variance (Allard, 1960). High heritability and high genetic advance were observed for plant height and days to 50 per cent bloom. Medium heritability and high genetic advance were observed for number of tillers per plant, straw weight, root weight and harvest index indicating that the variability was probably due to additive gene effects (Panse, 1957).

Correlation studies revealed that grain yield per plant is positively and significantly associated with earhead weight and harvest index. Plant height is positively correlated with days to 50 per cent bloom, total dry matter and straw weight but negatively with harvest index. It is due to the fact that plant height contributes to dry matter may be through straw weight. Days to 50 per cent bloom is associated positively with straw weight and negatively with harvest index. Rice cultivars with taller plants and longer duration have low harvest index (Chandler, 1969) and the same trend is noticed in *varagu* also. As total dry matter is positively correlated with root weight and straw weight and negatively with ear head weight, and as there is positive correlation between harvest index and yield, the grain yield could be improved by selecting plants either by harvest index or by ear head weight.

REFERENCES

ALLARD, R.W. 1960. **Principles of Plant Breeding**, John Wiley and Sons, New York. 485 pp.

CHANDLER, R.F. 1969. Plant morphology and stand geometry in relation to nitrogen. In: **Physiological aspects of grain yield.** (EASTIN, J.D., HASKINS, F.A., SULLIVAN, C.Y. and VAN BAVEL, C.H.M. (eds.) **Amer. Soc. Agron. Medium, Madison**, WT. pp. 265-90.

MILLER, P.A., WILLIAM, J.C., ROBINSON,H.F. and COMSTOCK,R.E. 1958. Estimates of genotypic and environmental variances and covariances in upland cotton and their implications in selection. **Agron.J.50**: 126-131.

PANSE, V.G. 1957. Genetics of quantitative characters in relation to plant breeding. **Indian J. Genet. Pl. Breed. 17**: 318-28.

PANSE,V.G. and SUKHATME,P.V. 1957. **Statistical Methods for Agricultural Workers**, edn. 2, Indian Council of Agricultural Research, New Delhi.

ROBINSON,H.R., COMSTOCK,R.E. and HARVEY,P.H. 1949. Estimates of heritability and degree of dominance in corn. **Agron.J.41**: 353-9.