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Short Communication

Genetic components of variation in sorghum [*Sorghum bicolor* (L.) Moench]

Y. Ravindrababu, A. R. Pathak and C. J. Tank

Department of Plant Breeding and Genetics, C. P. College of Agriculture, GAU, Sardarkrushinagar 385 506

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The genetic components of variance for ten elite lines of sorghum (ICSV 700, ICSV 705, IS 18551, GJ 39, GJ 40, CSV 15. GSSV 149, SR 670, Malwan and IS 2312) and their 45 F_1's derived through diallel (excluding reciprocals) were studied over two environments i.e., *kharif* 1996 and 1997 at Sorghum Research Station, GAU, Deesa. The experiments were laid out in a randomized block design with three replications in both the years. Each entry was represented by a single row with 45 × 15 cm, spacing. Five plants from each row of parents and F_1's were randomly selected to record five characters namely days to 50% flowering, plant height (cm), dry fodder yield/plant (g) and 1000 grain weight (g). The genetic components of variance were worked out as per Jinks and Hayman [1] and Hayman [2].

The estimation of genetic components suggested that both additive as well as dominance components of genotypic variance (Table 1) were highly significant. However, the magnitudes of dominance components were higher for days to flowering, dry fodder yield/plant and 1000-grian weights, thereby suggesting the preponderance of non-àdditive gene action for these traits. Earlier workers have [3,4] also reported similar results for these traits. The genotype × environment component was of considerable magnitude for plant height and dry fodder yield. The average degree of dominance for grain yield/plant suggested that this character was controlled by partial dominant gene effects. This 'indicated the possibility of improving this character. The coefficient of inbreeding (F) values were positive and significant for days to flowering and 1000-grain weight indicating the presence of dominant genes. The ratio of h^2/H_2 i.e., number of genes or gene groups controlling a character indicated that at least one group of dominant genes was responsible for all the characters under study. Patel *et al.* [6] reported that a single gene group was responsible for days to flowering and grain weight while two dominant gene groups for grain yield and plant height. The proportion of genes with positive and negative ($H_2/4H_1$) effects were very close to a theoretical value of 0.25 for all the characters except days to flowering, which indicated the near symmetrical distribution of negative and positive alleles. The ratio of KD/KR for grain yield/plant was very close to unity, thereby suggesting an equal proportion of dominant and recessive genes. For other characters an excess of dominant genes were noted.

Table 1. Genetic components of variation in sorghum

Genetic components	Days to flowering	Plant height	Dry fodder yield/plant	Grain yield/plant	1000-grain weight
D	25.79*±6.19	3236.92**±134.84	312.16**±75.26	136.08**±8.6	20.13**±2.77
H_1	61.16**+13.18	1486.99**+287.62	751.92**+160.20	82.71**+18.21	44.08**+5.9
H_2	43.59**±11.20	1303.70**±243.94	704.29**±136.15	72.92**±15.48	38.55**±5.01
F	37.95**±14.29	302.56±311.12	127.32±173.65	0.86±19.74	14.36*±6.39
h^2	9.48**±7.50	654.41**±163.28	544.16**±91.14	6.35±10.36	9.88**±3.35
E	0.02±1.87	21.14±40.66	2.52±22.69	0.19±2.58	0.06+0.84
(H_1/D) 1/2	1.54	1.65	1.55	0.78	1.48
$H_2/4H_1$	0.18	0.22	0.23	0.22	0.22
KD/KR	2.83	1.89	1.30	0.99	1.64
h^2/H_2	0.22	0.42	0.77	0.087	0.26
R(wr+vr)Yr	−0.5705	−0.8053**	−0.1867	0.6496**	0.3092

*Significant at 5% level; **Significant at 1 % level

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