

Genetic advance and path analysis in the F_2 generation of an intraspecific crosses in *rabi* sorghum

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SUMMARY

The F_4 segregating progenies (SPV 1457 x Y.Jola) 1-1, (Parbhani Moti x RR 9807) 1-9, (Parbhani Moti x RR 9807) 1-10, (Phule Yashoda x Parbhani Moti) 1-2, (SPV 1457 x RR 9807) 1-3 and, (Phule Yashoda x Parbhani Moti) showed better performance for yield and yield contributing characters. High G.C.V. values were observed for leaf area (cm^2), number of grains per earhead, number of primaries per earhead and grain yield per plant. The path coefficient analysis revealed the maximum contribution of earhead weight, earhead girth, number of secondaries and number of leaves to the grain yield.

Key words: Genetic advance, Path analysis, Variability, Heritability and Sorghum.

Sorghum (*Sorghum bicolor* (L.) Moench) is one of the important food crop of the world. Improvement in sorghum yield depends on the nature and extent of genetic variability, heritability and genetic advance in the base population. Besides the information on the nature of association between yield and its components helps in simultaneous selection for many characters associated with yield improvement. In the present study, such analysis has been carried out in the F_4 population and four checks.

MATERIALS AND METHODS

The 74 F_4 segregating progenies and four check varieties were sown in randomized block design with two replications at Sorghum Research Station, Marathwada Agricultural University, Parbhani during *rabi* 2003-04. Each entry was sown in a two row plot of 4.5m length. The row to row and plant to plant spacing of 45 cm and 15 cm was maintained, respectively. Five plants were selected randomly from each two row plot and replication for recording observation. Observations were recorded for fifteen characters viz., days to 50% flowering, plant height, number of leaves, leaf area (cm^2) of third leaf, days to physiological maturity, earhead length, earhead girth, earhead weight, number of primaries per earhead, number of grains per earhead, grain yield (g) per plant, test weight, dry fodder yield and harvest index (%). The coefficient of variability, heritability and genetic advance were estimated according to Mahmud and Kramer (1951) and genetic advance was calculated as per Lush (1940). The simple correlation coefficient were subjected to path analysis as per Dewey and Lu (1959).

RESULTS AND DISCUSSION

The coefficient of variability, heritability and genetic advance together are presented in Table 1. High genotypic coefficient of variation was exhibited by leaf area (cm^2) (25.65), while days to physiological maturity showed the lowest genotypic coefficient of variation (2.94). The high heritability and genetic advance estimates for leaf area, number of grains per earhead, number of secondaries and grain yield indicated that these characters are controlled by additive gene action and phenotypic selection for these characters will be effective. Higher heritability and genetic advance for leaf area, number of grains per earhead and grain yield per plant have been reported by Wankhede *et al* (1985).

The F_4 segregating progenies (SPV 1457 x Y.Jola) 1-1, (Parbhani Moti x RR 9807) 1-9, (Parbhani Moti x RR 9807) 1-10, (Phule Yashoda x Parbhani Moti) 1-2, (SPV 1457 x RR 9807) 1-3 and (Phule Yashoda x Parbhani Moti) 1-6 showed better performance for yield and yield contributing characters viz., Earhead weight, earhead girth, number of grains per earhead and number of primaries and secondaries per earhead. These characters showed highly significant positive correlation with grain yield through their direct and indirect effects and also showed high heritability coupled with genetic advance.

Grain yield was positively correlated with all the characters studied (Table 2). Positive association of grain yield with earhead weight, number of grains per earhead, dry fodder yield per plant, harvest index and earhead girth have already been reported.

Inter character correlations at genotypic level showed positive significant correlation of days to 50%

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