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Genetic variability, correlation and path co-efficient in segregating generation of Pearl millet (*Pennisetum glaucum* L.)

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ABSTRACT

In 60 F_3 progenies of pearl millet variability, heritability, genetic advance, correlation and path co-efficient for fifteen metric traits were studied. Stover yield, grain yield, earhead weight plant, total biomass per plant and earhead girth showed high GCV, heritability and genetic advance as percentage of mean. Heritability (broad sense) ranged from 14.93% (av. internode length) to 92.38% (total biomass per plant). The correlation of grain yield with earhead weight, average internode length, total biomass per plant, stover yield, no. of leaves per plant and no. of productive tillers per plant was significant and positive. The path coefficient analysis revealed that stover yield, earhead weight, no. of leaves per plant and average internode length had both direct and indirect effects to account for yield. The characters total biomass per plant and no. of productive tillers per plant showed negative direct effects but had positive indirect effects through no. of leaves per plant, earhead weight and stover yield per plant.

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Key words : Genetic variability, Segregating generation, Pearl millet

INTRODUCTION

Pearl millet (*Pennisetum glaucum* L.) is world's sixth and India's fourth important cereal crop. For bringing desired improvement in the crop plants, the first pre-requisite is the genetic variability with which a plant breeder has to work. Breeding for high yield requires information on the nature and magnitude of variation in the available material. According to Biradar *et al*. (1991), in most of the cases quantum of variability is studied by evaluating the homozygous cultivars, but inferences derived will become more meaningful only when is based on individual plant observations in segregating generation like F_2. The knowledge of association of the yield components inter se and with grain yield is useful for formulating efficient selection criteria for desired improvement. Further, the direct and indirect influence of such component characters on yield can obviously be of considerable use for a rational breeding approach. The present study was thus, undertaken to determine the inheritance pattern of each trait, nature and degree of association between different characters and to establish an understanding for direct and indirect selection of different traits in segregating generation (where selection is actually practiced) will be more meaningful and of immediate practical utility (Sawant *et al.*, 1995).

MATERIALS AND METHODS

The sixty F_3 progenies were chosen for the present studies from F_2 populations of eight crosses *viz.*, J-2290 x G-4 (11), J-2290 x G-5 (08), J-2290 x G-6 (03), J-2340 x G-4 (11), J-2340 x G-5 (08), J-2340 x G-8 (10), JMSB-101x G-7 (08) and PT-5591× G-4 (01). The 60 F_3 progenies were evaluated in Randomized Block Design (RBD) with three replications at the Regional Research Station, Anand Agricultural University, Anand (latitude 22^0 35' N, longitude 73^0 0 E and an altitude of 45.07 meters) Gujarat during Summer 2007. Each genotype was accommodated in plots of two rows of 4 m length and inter row distance of 0.6 m. Observations were recorded on ten random plants in each genotype for fifteen traits *viz.*, Grain yield per plant, days to 50% flowering, plant height, test weight (1000-grain weight), earhead length, earhead girth, average stem thickness, average internode length, earhead weight per plant, number of productive tillers per plant, number of leaves per plant, days to maturity, stover yield per plant, total biomass accumulation per plant and harvest index. The plot means were used to compute the analysis of variance as described by Panse and Sukhatme

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