

Correlation and path analysis in amaranthus

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ABSTRACT

Six genotypes of vegetable amaranthus and thirty F_1 hybrids were involved to estimate the correlation and path analysis. The correlation coefficient between yield of greens with weight of leaves was highest both at genotypic level and at phenotypic level. Path analysis indicated that weight of leaves and weight of stem had higher and direct contribution to the yield.

Key words : Amaranthus, Genotypes, Hybrids, Correlation, Path analysis

Amaranthus is an important vegetable among the green vegetables and is rich in Iron and Vitamins. They are tall, soft-wooded annuals, extensively grown throughout India for their green leaves and succulent stem.

In the genetic improvement programme of a crop, association between traits following crosses reflects gene linkages and helps the breeder to decide specific combinations of traits from two parents. The selection for one trait invariably affects a number of associated characters. The estimation of correlation coefficients is of greater value to determine the extent and nature of relationship. Knowledge of such inter-relationship among the characters is useful to the breeders for improving efficiency of selection. In this study, an attempt was made to study the association of characters between each other and their influence on yield.

Importance of correlation study in selection programme is appreciable when highly heritable characters are associated with the important characters like yield. Moreover for important of complex characters like yield per plant direct selection is not much effective, since number of specific forces are involved in the expression of the yield potential of a genotype. Yield is a polygenically controlled complex character affected by a large number of components. Hence, the knowledge of correlation between yield and component characters and among component characters themselves is essential for a rational and direct improvement in yield. The correlation along with path analysis would give a better appreciation of cause and effect relationship between pairs of characters. In the present study, the association of different yield characters and the interrelationships with one another were also investigated.

MATERIALS AND METHODS

The experiment were carried out at College Orchard, Tamil Nadu Agricultural University, Coimbatore. The experimental material included six genotypes of amaranthus which were used as parents, which were designated as P_1 , P_2 , P_3 , P_4 , P_5 and P_6 . Parents were raised in a randomized block design with three replications and crossed in a full diallel design. Observations were recorded on plant height, days for 50% flowering, weight of leaves, weight of stem, number of leaves, leaf area and yield. Simple correlations and path analysis were worked out following the methods of Panse and Sukhatme (1957).

RESULTS AND DISCUSSION

In any crop improvement programme, knowledge on the association of characters is of significant importance since it contributes indirectly to the success of selection. Yield is considered to be a dependent variable on several sub components. In such cases, knowledge of the nature of association between such characters is a great asset for plant breeders to formulate their breeding procedures. It has been suggested that yield might be more effectively increased simultaneously improving one or more yield components.

The result on association between yield and other components *viz.*, leaf area, weight of leaves, weight of stem, total dry matter, number of leaves, plant height at maturity and days for 50% flowering are presented in Table 1.

Yield of greens had significant genotypic and phenotypic correlation with weight of leaves, weight of stem, total dry matter and plant height at maturity. Similar findings were reported by Elangovan *et al.* (1980), Veeraragavathatham (1989) and Sivagama Sundari (1991)