Genetic variability, correlation and path analysis in muskmelon (*Cucumis melo* L.)

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ABSTRACT

Fifty genotypes of Muskmelon (*Cucumis melo* L.) were evaluated for variability, correlation and path analysis for yield and its contributing characters. The analysis of variance showed significant variation for all the characters, indicating presence of sufficient variability in the material studied. The moderately high genotypic and phenotypic coefficient of variation was observed for fruit yield per plant followed by acidity percentage, fruit per plant and total soluble sugar. Genotypic correlations were higher than those of their respective phenotypic correlation coefficients in majority of the cases suggesting that genotypic correlations were stronger, reliable and free from the environment factors. The path analysis based on genotypic associations revealed that fruits per plant and moisture percentage were the main yield attributing characters in fruit yield of muskmelon, because of its high positive direct effect and positive correlation with fruit yield per plant. In addition to moisture percentage and fruits per plant, total soluble solids also exhibited positive direct effect on fruit yield per plant. Thus, it could be advocated that fruits per plant, moisture percentage and total soluble solids should be given more weightage for an effective selection programme to improve the fruit yield in muskmelon.

Key words: Muskmelon, Variability, Correlation, Path analysis.

Muskmelon (*Cucumis melo* L., 2n = 24) is the most common dessert vegetable crop grown all over the world. It is highly relished because of its flavour, sweet taste and refreshing effects. It is good source of dietary fiber, vitamins and minerals. However, very little work has been carried out on improvement of the muskmelon crop. For any crop improvement programme aimed at achieving maximum productivity, a detailed knowledge of genetic variability of various quantitative characters and their contribution to yield is essential. Correlation studies helps in finding out the degree of inter-relationship among various characters and in evolving selection criteria for improvement. While path coefficient analysis provides a better index for selection than mere correlation coefficient by separating the correlation coefficients of yield and its components into direct and indirect effects. Therefore, the present study was carried out to find out all possible components characters for improvement of this crop through character association and path-coefficient analysis.

MATERIALS AND METHODS

The experiment was carried out at the Main Vegetable Research Station, Anand Agricultural University, Anand during 2004-05. The experimental material comprised of 50 genotypes of muskmelon from different sources in India. The experimental site is situated at an altitude of 45.1 m above mean sea level, lying between latitude of 22^0-35' North and longitude 77^0-55' East. The genotypes were grown in randomized block design with three replications at spacing of 150 cm (row to row) and 90 cm (plant to plant) in a plot size of 6 x 4.5 m. The observations were taken on the randomly selected 10 plants from each plot. All the recommended cultural practices were followed during experimentation. Observations were recorded on number of node on which first female flower appears, days to first picking, fruit weight (kg),fruit length (cm), fruit girth (cm), flesh thickness (cm), fruits per plant, fruit yield per plant (kg), moisture content (%), total soluble solids (TSS in %), total soluble sugars (mg g^{-1}) and acidity (%). The analysis of variance proposed by Panse and Sukhatme (1978) was followed to test the significance of difference between the genotypes for all the characters studied, while correlation coefficient and path coefficient analysis was carried out following the methods given by Singh and Choudhary (1977) and Wright (1921), respectively.

RESULTS AND DISCUSSION

The analysis of variance showed significant variation for all the characters, indicating presence of sufficient variability in the material studied. The genotypic variance contributed a major proportion of total variance in characters like fruit yield per plants number of nodes on which first flower appears, days to first picking, fruit girth,