



Research Paper

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Genetic parameters and correlation study for yield and quality traits in tomato

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ABSTRACT : The present investigation was conducted at Vegetable Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi during *Rabi* 2008-09. The Genetic parameters and correlation were studied for yield and quality traits in tomato. The experimental material comprised of thirteen genotypes (10 lines+3 testers) and their thirty crosses along with two checks of tomato and the experiment was laid out in Randomized block design with three replications. The maximum genotypic and phenotypic variation was (168.30 and 169.95 cm.) for plant height and minimum for fruit shape index (0.02 and 0.02), respectively. Analysis of coefficient of variation revealed that magnitude of phenotypic co-efficient was higher than genotypic coefficient of variation for all the characters except primary branches per plant under study. The magnitude of genotypic and phenotypic coefficient of variation was higher for number of fruits per cluster (18.04 and 18.32), lycopene content (22.07 and 22.46), respectively. High values of heritability (broad sense) for plant height (99%) and fruit per cluster, total soluble solids and lycopene (97%) and high genetic advance were observed for plant height and average fruit weight (26.59 and 14.88%), respectively. A positive and significance association of yield per plant with all the traits both at genotypic and phenotypic levels.

KEY WORDS : Co-efficient of variation, Heritability, Genetic advance, Correlation, Tomato.

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Tomato (*Solanum lycopersicum* L.) $2n=24$, is one of the most widely grown vegetable crop in the world. It is planted 4.39 million hectares of with a total production of 150.51 million ton (FAO STAT, March 2012). India is the second largest tomato producer in the world after China, accounting for about 11 per cent of the world tomato production (Indian Horticulture Database, 2011). During 2010-11, the area and production of tomato, in our country was about 0.865 mha. and 16.82 mt, respectively (Indian Horticulture Database, 2011). The concept of heritability is important to determine whether the phenotypic difference found among different individuals are new to difference in their genetic makeup or simply a result of environmental factors. The yield being an important complex character is influenced by a number of its component characters. The genetic improvement of the crop depends largely upon the

nature and relative magnitude of components of genetic variance involved for yield, quality and its components. Efforts are being made to increase its productivity by developing superior varieties. In tomato yield is the cumulative effect of many component characters individually contributing towards yield. As yield and quality are the main objective of a breeder, it is important to know the relationship between various characters that have direct and indirect effect on yield and quality. The degree of relationship for association of these characters with yield and quality can be ascertained by correlation studies. This would aid in formulating an efficient breeding program for improving the yield potential and quality via its components. The ratio between genotypic and phenotypic coefficient of variation (GCV/PCV) of all the traits showed near to unity indicating the role of environment factor in the expression of traits would be negligible which elucidated