International Journal of Plant Sciences (2006) **1** (2) : 154-155

Variability, heritability and scope of improvement for yield components in okra (*Abelmoschus esculentus* (L.) Moench)

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(Accepted : March, 2006)

SUMMARY
Sixty-four diverse okra genotypes were evaluated for genotypic and phenotypic variability, heritability and genetic advance in ten quantitative characters. Considerable amount of genetic variability was exhibited by number of the branches per plant, fruit yield per plant, tapering length, plant height and fruit length. The closer magnitude of gcv and pcv indicated that greater magnitude was played by genotype rather than environment. The heritability estimates were high for days to first flower, first fruiting node length. The genetic advance and heritability suggested that the characters such as first fruiting node length, number of the branches per plant, tapering length and fruit yield per plant were under additive gene effects

Key words: Genotypic variability, Phenotypic variability, Heritability, Genetic advance, Okra.

In quantitative traits, variation at phenotypic level includes the genotypic, environmental and the variation due to interaction between the two, but a breeder is primarily interested in genetic variability, because it provides response to selection. India being center of diversity for okra provides a range of variation for its genetic improvement in yield. For improvement in yield, it is necessary to have the knowledge of genetic variability present in the population, heritability of various characters and probable genetic advance to be expected from selection of superior lines. Hence, the present study was undertaken with 64 genotypes for estimating range of variation and genetic parameters of 10 traits in okra.

MATERIALS AND METHODS

The experiment was conducted at the Research Farm at Allahabad Agriculture Institute.-Deemed University, Allahabad The soil of experimental field was sandy loam with low organic carbon and little alkaline in nature. The experiment comprising 64 treatments including 8 parents, 28 F1s and 28 F2s progenies were grown in randomized block design with three replications during rainy season. The parents and F1s were grown in single row and F2 s in three rows. Each row was 3 meter long, 60cm apart and 30cm.spacing between plants. The normal cultural practices were followed to raise the crop. Observations on ten characters i.e. days to first flower, first fruiting node length, plant height, number of branches per plant, number of nodes per plant, length of the fruit, width of the fruit, tapering length of the fruit, number of fruits per plant and fruit yield per plant were recorded. The coefficient of variations were estimated by using the method of Burton and Devane (1953). Heritability in narrow sense was estimated by formula suggested by Kalton etal.(1952) and expected genetic advance was estimated according to the method given by Fobinson etal.(1949).

RESULTS AND DISCUSSION

The analysis of variance for various characters showed that the genotypic differences were highly significant for all the traits studied. The estimates of mean, range, phenotypic and genotypic coefficients of variability, heritability in narrow sense and expected genetic advance for all the characters are presented in Table –1.Results exhibited that coefficients of phenotypic variability were always higher than there corresponding genotypic variability but their closer magnitude for plant height, first fruiting node length, width of the fruit, tapering Length, days to first flower, length of the fruit and number of the nodes per plant suggested that greater role was played by genotype rather than environment. However, the characters number of branches per plant, fruit yield per plant and number of fruits per plant were some what influenced by the environment. The coefficient of variability (percentage) both at phenotypic and genotypic level were high for number of branches per plant, fruit yield per plant, number of nodes per plants, tapering length, plant height, length of the fruit and first fruiting node length. Similar observations were also made by Panda and Singh.(1997) and Dhankahar and Dhankhar.(2002) While considering F_1 and F_2 generations together, high heritability was observed for days to first flower, first fruiting node length and medium for plant height, number of fruits per plant and fruit yield per plant. This indicates that environment would play a little role inheriting these traits to the progenies.

The genotypic coefficient of variation together with hertability reflect the picture of genetic advance to be expected from selection (Burton,1952).In the present study first fruiting node length, number of the branches per plant, tapering length and fruit yield per plant gave high heritability estimates with moderate genetic advance in comparison to other characters, which indicates that additive gene effects to provide a rapid genetic improvement.

Days to first flower, plant height, fruit length, number

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