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# Genetic variability for morpho-physiological traits in parental lines of *Gossypium*

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**SUMMARY**

In present investigation attempt is being made to study genetic variability at both morphological and physiological level so as assess different traits of parental lines of cotton which will help to develop varieties and hybrids suitable for rainfed condition. Genotypes having CSI lower than the checks coupled with yield higher than or at least comparable with the checks (LH-1556, RHC-2004 and RHBB-9923) will be useful for water stress condition and high temperature and are traced out in present study. The high magnitude of PCV and GCV was recorded in all the traits studied except GP suggesting the presence of wide variability for these traits.

**Key words :** Genetic variability, morpho-physiological traits and *Gossypium*

Cotton is the most important textile fiber crop and is the second most important oilseed crop in the world (Cherry and Leffler, 1984). While developing ideal plant types, they become less and less diverse because of genetic erosion. Therefore, study of variability of material to be used for breeding need to be focused because it is prerequisite for any successful breeding programme. Though India ranks 1st in respect of cotton area in world, most of it is under rainfed condition and there are limitations to bring more and more area under irrigated condition. Hence, it is very much important to develop varieties suitable for rainfed situation. However, very few attempts have been made to study genetic variability jointly at morphological and important physiological attributes like CSI, stomata density, leaf area etc which influence water requirement of plant. Therefore, present study was undertaken to know genetic variability for morphological and physiological traits in maintainer and restorer lines of *G. hirsutum*.

## MATERIALS AND METHODS

A field experiment was conducted with twenty-six genotypes of *Gossypium hirsutum* which were sown in randomized block design with three replications at All India Co-ordinated Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri during *Kharif* 2007. Each entry was sown in two rows of 4.8 m length spaced 90 cm apart. Plants were spaced at 60 cm within a row. All the routine cultural practices were followed to grow good crop. Fertilizers were applied @ 100 kg N: 50 kg $P_2O_5$: 50 kg $K_2O$/ ha. Ten plants were randomly taken in each treatment within each replication for recording the observations on 10 quantitative characters. The data on physiological parameters were recorded at 50 per cent flowering while that on yield and yield components were recorded after harvesting. The observations were recorded on trichome density, adaxial and abaxial stomata density, number of leaves per plant, CSI, leaf area, seed cotton yield per plant, lint yield per plant, harvest index and ginning percentage. The analysis of variance was done as suggested by Panse and Sukhatme (1985). The phenotypic and genotypic variances were calculated as per formula suggested by Johnson *et al*. (1955).

## RESULTS AND DISCUSSION

The existence of genetic variability present in the breeding programme is responsible for the effective selection. Larger is the variability greater the scope of selection and improvement. The main objective of any breeding programme is to study the genetic variability in the material under study and utilization of suitable breeding procedure with the help of selection in the desired direction. The results revealed the presence of wide range of variability among the parental lines of *Gossypium*. The estimates of mean, range, phenotypic and genotypic coefficient of variance, heritability, genetic advance and expected genetic advance to all the characters are presented in Table 1 and 2.

The treatment mean squares were significant for all the characters studied, suggesting the presence of substantial variability for various characters studied in genotypes evaluated. On the basis of mean performance, the promising parental lines were RHBB-9714(chlorophyll stability index), RHCb-001 (adaxial stomata density),

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