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# Genetic variability studies in banana hybrids

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## ABSTRACT

Genetic Variance, Heritability, genetic advance and correlation coefficient components were studied in 19 hybrids in order to identify desirable genotypes for crop improvement programme. On the basis of fruit quality characters along with more number of fruits/hand, bunch weight and early crop duration, the hybrids NPH-02-01 and h-03-19 were observed to be more potential. The estimates of GCV and PCV were high for bunch weight, moderate GCV and PCV for number of hands/bunch and pseudostem height indicated better scope of improvement through selection. The genetic advance as percentage of mean ranged from 35.86 to 96.88. High estimates of heritability values accompanied with high genetic gain were observed for bunch weight, number of fruits/ hand, days taken from planting to shooting, number of leaves at shooting and crop duration. A very strong positive and significant correlation was recorded between bunch weight and number of fruits/hand (0.752) and number of hands/bunch (0.632) indicating that effective improvement through these characters could be achieved in banana.

**Key words :** Genetic variability, Banana hybrids, Heritability, Genetic advance.

Banana is the important staple and commercial crop world wide, but its improvement through artificial selection has proven difficult due to a limited understanding of the genetic organization and meiotic behaviour of the species (Ortiz and Vuylsteke, 1996). Genetic improvement of musa has traditionally been carried out through interspecific and interdiploidy crosses, with the major objective of producing hybrids that are high-yielding per unit area and time (Buddenhagen, 1997). Hence, improved hybrids should be photosynthetically efficient, early to mature in the first production cycle, and display minimum delay between consecutive harvests (Eckstein *et al*., 1995; Ortiz and Vuylsteke, 1994). The present investigation was taken up in TNAU, Coimbatore, India, to evolve banana hybrids resistance to nematodes involving the resistant male parents like Anaikomban and Pisang Lilin with the commercial cultivar Karpooravalli.

## MATERIALS AND METHODS

The hybridization resulted in 19 hybrids with 15 tetraploids (AABB), 2 triploids (AAB) and 2 diploids (AB). These hybrids were evaluated in their phase I generation (seed to sucker- single plant seggregant) by Damodaran, 2003 for agronomic traits as a single plant. These hybrids were taken for their phase II generation (sucker to sucker) and their performances were recorded. The experiment was laid out in Randomized Block Design with three replications and five plants per replication. The observations *viz*., days taken from planting to shooting, height of pseudostem, height of the following sucker, number of leaves at shooting, number of leaves at harvest, crop duration, girth of pseudostem, number of hands / bunch, number of fruits / hand and bunch weight. To characterize and categorize the hybrids, the fruit quality characters were also assessed but not included for the variability studies.

The replicated values were subjected to statistical analysis of variance as prescribed by Panse and Sukhatme (1984).

The phenotypic and genotypic variances were computed as per the methods suggested by Johnson *et al*. (1955).

$$\text{Phenotypic variance } (\sigma^2 p) = (\sigma^2 g) + (\sigma^2 e)$$

where,

$(\sigma^2 e)$ = error variance

$$\text{Genotypic variance } (\sigma^2 g) = \frac{M_1 - M_2}{r}$$

where,

$M_1$ = Mean sum of squares for genotypes
$M_2$ = Mean sum of squares for error
r = Number of replications

$$\text{Environmental variance } (\sigma^2 e) = S(Xij - Xi - Xj + X)$$

where,

Xij = Mean sum of treatments and replications
Xi = Mean of treatments