INTERVARIETAL HYBRIDIZATION AND EVALUATION OF F_1 PROGENIES IN EGGPLANT (*Solanum melongena L.*)

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ABSTRACT

This study was under taken primarily to estimate the heterotic effect of selected important agronomic characteristics in F_1 hybrids of the crosses between two local varieties (Palugamam purple and Palugamam white) and two exotic varieties (Slimijim and SM-6-6) of brinjal (Solanum melongena L.) and their reciprocal crosses also to establish correlation among selected agronomic characters with yield.

The experiment for this study was carried out at the Eastern university Vantharumoolai located in the eastern region of Sri Lanka during the period of July to November, 1998.

Four inbred parents Slimjim (origin in Italy) , SM-6-6 (origin in India) from AVRDC, Taiwan ; Palugamam purple and Palugamam white (from Batticaloa district) were included in this study along with the F_1 hybrids of the crosses between Slimjim x Palugamam purple, Slimjim x Palugamam white, SM-6-6 x Palugamam purple, SM-6-6 x Palugamam white and their reciprocals.

All the treatments were arranged in a Randomized Complete Block Design (RCBD) with three replications. Data collection commenced with the initiation of field emergence of the seedling and terminated with the last harvest.

The following Agronomic characters were considered; height at first flowering, height at first harvest, height at last harvest, days to first flowering, number of long styled flower in a cluster, number of fruits per cluster, number of fruits per plant, fruit weight at first, eighth and last harvest, fruit length at first, eighth and last harvest, fruit

girth at first, eighth, and last harvest ,total yield and the shoot and fruit borer damage.

The collected data were subjected to statistical analysis of variance (ANOVA), mean comparison-using DMRT and a correlation analysis between the important agronomic characters were also performed.

In this study F_1 hybrids have shown heterobeltiosis (better than better parent or over dominance), incomplete dominance and additive gene effect for the selected agronomic characters.

All F_1 hybrids showed significantly higher yield than their parents and significant heterotic effect in total yield (p=0.05). The results indicated that there was a possibility to uplift the yield up to 80% by cultivating the F_1 hybrids of the crosses rather than their parents. Heterobeltiosis has been observed for plant height at first flowering under the influence of over dominance.

Since the F_1 hybrids showed lower values than mid parent value but very closer to mid parent value for number of fruits per plant and number of long styled flower in a cluster which can be attributed to the additive gene effect and exploitation of hybrid vigour may not be possible for these characters.

All F_1 hybrids were early to reach first harvest, the earliness is considered a genetic advantage in crop improvement. Weight, length and girth of fruit were found to be under the influence of incomplete dominance gene action , leading to heterotic which is important to increase the total yield in brinjal.

Positive correlation indicating the direct relationship was observed between yield and yield components such as fruit weight, girth and length

and yield also positively correlated with height at first flowering , height at first harvest and height at last harvest.

It is apparent that selection is to be aimed for high value of fruit weight, length and girth to uplift the yield.
Among the organoleptic characters, fruit colour was influenced by incomplete dominance gene effect and fruit shape was cylindrical in all F_1 hybrids, which is a desirable character for selection.

Moderately resistant to shoot and fruit borer insect was apparently seen in the hybrids of the crosses between Slimjim x Palugamam purple, Palugamam purple x Slimjim and the parent Slimjim under field condition. Therefore selection of genotypes with moderately resistant to shoot and fruit borer is possible from these crosses. However further investigation is needed to confirm the estimated resistance.

The results of this experiment revealed that heterosis would be exploited for many of the important agronomic characters including yield in brinjal and hence development of F_1 hybrid from varieties of diverse origin would be considered a successful attempt in brinjal, providing suitable parents are selected with a great accuracy.

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