

INTERVARIETAL HYBRIDIZATION AND
EVALUATION OF F₁ PROGENIES IN
EGGPLANT (*Solanum melongena* L.)

BY

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ABSTRACT

This study was undertaken 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 (Slimjim 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.

CONTENTS

	Page number
Abstract	i
Acknowledgement	iv
Contents	v
Lists of table	x
List of figure	xi
List of plates	xi
CHAPTER .01 INTRODUCTION.	
1.0 Introduction	1 -5
CHAPTER .02 REVIEW OF LITERATURE	
2.1 Origin and distribution of brinjal	06
2.2 Taxonomy	06
2.3 Common names of brinjal	07
2.4 Areas of cultivation	07
2.5 Environmental response	07
2.6 Botany	07
2.6.1 Root	08
2.6.2 Stem	08
2.6.3 Leaves	08
2.6.4 Flower biology	08
2.6.4.1 Types of flower	08
2.6.4.2 Anthesis	09
2.6.4.3 Fruitset	09
2.6.5 Fruits	09
2.6.5.1 Storage of fruits	10
2.7 Seed production	10

2.8 Importance of brinjal	10
2.8.1 Nutritional importance	10
2.8.1.1 Composition of brinjal	11
2.8.2 Medicinal importance	13
2.8.3 Economic importance	13
2.9 Crop improvements	14
2.9.1 Yield and yield components	14
2.9.2 Inheritance	15
2.9.2.1 Qualitative	15
2.9.2.2 Quantitative	16
2.9.2.3 Hybridization	17
2.9.2.4 Hybrid vigour	17
2.10 Eggplant improvement programme at AVRDC	19
2.10.1 Genetic resources enhancement and varietal development.	20
2.10.1.1. Genetic resource activity	20
2.10.1.2 .Evaluation of egg plant cultivars and germplasm	20
2.10.1.3. AVRDC egg plant germplasm collection,1995	20
2.11. Brinjal varieties at global level	22
2.12. Interspecific hybridization	23
2.13 .Innovative Technology in the improvement in egg plant.	24
2.13.1 .Genetic engineering in egg plant improvement	24
2.13.2. Somatic hybrid in egg plant	26
2.13.2.1 Somatic hybrid in eggplant obtained by PEG/DMSO fusion of gamma-irradiated mesophyll protoplast.	26
2.13.2.2 Production and charactrization of fertile Somatic hybrid plant.	27

CHAPTER. 04 RESULTS AND DISCUSSION

4.1 Fruit yield	39
4.2 Number of fruits per plant	43
4.3 Plant height at first flowering	46
4.4 Plant height at first harvest	49
4.5 Plant height at last harvest	49
4.6 Days to first harvest	49
4.7 Fruit weight	53
4.7.1 Fruit weight at first harvest	53
4.7.2 Fruit weight at eight harvest	53
4.7.3 Fruit weight at last harvest	54
4.8 Fruit length	62
4.8.1 Fruit length at first harvest	62
4.8.2 Fruit length at eight harvest	62
4.8.3 Fruit length at last harvest	63
4.9 Fruit girth	70
4.9.1 Fruit girth at first harvest	70
4.9.2 Fruit girth at eighth harvest	70
4.9.3 Fruit girth at last harvest	71
4.10 Number of fruits per cluster	78
4.11 Long styled flower in a cluster	79
4.12 Reaction to shoot and fruit borer	80
4.13 Correlation between yield and yield components and plant characters	83
4.14 Other characters.	85
4.14.1 Colour of the fruit	85
4.14.2 Shape of the fruit	86
4.14.3 Characteristic of the calyx	87
4.14.4.Fruit characters in relation to shoot and fruit borer	88

CHAPTER . 03 MATERIALS AND METHODS.

3.1 Location	29
3.2 Variety of Brinjal used	29
3.3 The varieties and F1 hybrids	30
3.4 Experimental design	31
3.5 Block size	31
3.6 Spacing	31
3.7 Agronomic practices	31
3.7.1 Land preparations	32
3.7.2 Manure and fertilizer application	32
3.7.3 Transplanting	32
3.7.4 Irrigation	33
3.7.5 Weed control	33
3.7.6 Pest and disease control	33
3.8 Measurement and Observation	33
3.8.1 Plant height	34
3.8.2 Days to first harvest	34
3.8.3 Number of long styled flower	34
3.8.4 Number of fruits per cluster	34
3.8.5 days to first harvest	35
3.8.6 Length of fruit	35
3.8.7 Girth circumference of fruits	35
3.8.8 Mean weight of the fruit and yield components	35
3.8.9 Number of fruits per plant	35
3.8.10 Yield estimation	35
3.8.11 Number of shoot and fruit borer damaged fruits	35
3.9 Other morphological characters	36
3.10 Statistical analysis	36
4.14.4.Fruit characters in relation to shoot and fruit borer	88