

PERMANENT REFERENCE

**EVALUATION OF CHILLI (*Capsicum annuum* L.)  
GENOTYPES FOR POT CULTURE UNDER LOCAL  
ENVIRONMENTAL CONDITION OF DL2 AGRO  
ECOLOGICAL REGION**

(P3)

633.84072  
921



**RAJARETNAM SIVATHARSHAN**  
**EU/IS/2000/AG/20**



FAG184



Project Report  
Library - EUSL

59412

**FACULTY OF AGRICULTURE**  
**EASTERN UNIVERSITY**  
**SRILANKA**

**PROCESSED**  
Main Library, EUSL

## **Abstract**

This experiment was conducted during the period June 10, 2004 to November 9, 2004 in the Net-House of the Agronomy farm, Eastern University, Vantharumooli, Chankalady, in Batticaloa district, in order to identify the most suitable Chilli (hot pepper) varieties to grow under pot culture with conditions prevailing in the Eastern region of Sri Lanka.

Six hot pepper (Chilli) varieties namely Arunalu, KA-2, MI-2, PC-1, Wannimiris and Acc#2194 were evaluated along with the studied variety Arunalu. All the varieties were planted in a Complete Randomized Design (CRD) with four replications and were managed under the recommended cultural practices.

The data on Canopy height at 50% flowering, Canopy height at 100% flowering, Canopy height at first harvest, Canopy width at 50% flowering, Canopy width at 100% flowering, Canopy width at first harvest, Days to 50% flowering, Days to 100% flowering, Fruit length, Fruit girth, Fruit weight, Number of fruits per plant and Mature green fruits per plant were collected in this experiment and were statistically analyzed to determine the level of significant. Varieties tested in this study showed significant differences ( $P < 0.05$ ) in growth parameters such as Canopy height at 50% flowering, Canopy height at 100% flowering, Canopy height at first harvest, Canopy width at 50% flowering, Days to 50% flowering, Days to 100% flowering, Fruit length, Fruit girth, Fruit weight, Number of fruits per plant and Mature green fruits per plant.

The correlation studies revealed that some characters studied were positively correlated: They were Canopy width at 100% flowering and yield per plant; Number of fruits per

plant and yield per plant; Fruit length and yield per plant; Canopy height at 50% flowering and Canopy height at 100% flowering; Canopy height at 50% flowering and Canopy height at first harvest; Canopy width at 50% flowering and fruit length; canopy width at 50% flowering and canopy width at 100% flowering; Canopy height at 100% flowering and Canopy height at first harvest; Canopy width at 100% flowering and Fruit length; Canopy height at first harvest and Fruit girth; Days to 100% flowering and Fruit girth. Some other characters were negatively correlated: They were canopy width at 100% flowering and days to 50% flowering; Number of fruits per plant and fruit girth.

By and large, it is clearly seen that among the varieties tested a wider variation does exist in several traits of agronomic importance and hence, selection may be positively approached for particular characters of specific measures in order to use in chilli improvement programme, although yield and adaptability are the first and foremost criteria.

Considering the results in general, it can be suggested that varieties KA-2 and Arunalu are the most suitable ones identified to grow under pot culture with conditions prevailing in the Eastern region of Sri Lanka, primarily during the dry season under irrigation. This method of cultivation is more appropriate in location where there is water scarcity and as much identification of suitable varieties is a must.



# CONTENTS

	Page No
<b>ABSTRACT</b>	<b>I</b>
<b>ACKNOWLEDGEMENT</b>	<b>III</b>
<b>CONTENTS</b>	<b>IV</b>
<b>LIST OF FIGURES</b>	<b>IX</b>
<b>LIST OF TABLES</b>	<b>X</b>
<b>LIST OF PLATES</b>	<b>XI</b>
<b>CHAPTER 1</b>	
1.0 INTRODUCTION	1
1.1 Crop distributions of Chilli	1
1.2 Economic important	2
1.2.1 Nutritional importance	2
1.2.1 Medicinal importance	3
1.3 Species in Genus <i>Capsicum</i>	3
1.4 Growing Chilli Pepper in containers	3
1.5 Constraints for the expansion of Chilli cultivation in Sri Lanka	4
1.5.1 Unavailability of suitable varieties	4
1.5.2 Pest and Diseases	4
1.6 Objectives of the study	5
<b>CHAPTER- 2</b>	
2.0 REVIEW OF LITERATURE	7

2.1 General history of Capsicum	7
2.2 Nomenclature / Systematics	7
2.2.1 Taxonomic description of Chilli	8
2.2.2 Diagnostic description of the five domesticated species and keys for field identification	9
2.3 Crop ecology	12
2.4 Genetics of Capsicum	13
2.5 Botany of the crop	13
2.6 Breeding of Chilli	14
2.7 Pollination and fruit set	16
2.8 Cultivation of <i>Capsicum annuum</i>	16
2.9 Total extent and production of Chilli	16
2.9.1 Total extent of Chilli cultivation in Sri Lanka	16
2.9.2 Extent of Chilli cultivation in Batticaloa district	17
2.10 Chemical composition	18
2.11 End uses	18
2.12 Association of morphological characters and yield related characters	19
2.13 Economic importance of Capsicum	20
2.14 Home gardening	20
2.14.1 Principles of home gardening	21
2.14.2 Location and size of the home gardening	22
2.14.3 Planning the home gardening	22
2.14.4 Choice of crops for home garden	22
2.14.5 Intensive vegetable plots	23

2.14.6 Advantages of home gardening	24
2.14.7 Container garden	25
2.14.8 Suitability of Chilli varieties as container plant	25
2.15 Recommended varieties of Capsicum in Sri Lanka	26
2.16 Chilli cultivars in Sri Lanka	26
2.16.1 Available Chilli cultivars in Sri Lanka	26
2.16.1.1 Chilli cultivar MI-1	26
2.16.1.2 Chilli cultivar MI-2	27
2.16.1.3 Chilli cultivar Santhaka	27
2.17 Chilli improvement program in Sri Lanka	27
2.18 Virus diseases of Chilli	28
2.18.1 Chilli leaf curl complex	28

## CHAPTER 3

3.0 MATERIALS AND METHODS	31
3.1 Location of the experiment	31
3.2 Varieties of Chilli used	31
3.3 Experimental design and planting	32
3.3.1 Experimental design	32
3.4 Agronomic practices	33
3.4.1 Pot preparation	33
3.4.2 Plant establishment	33
3.4.3 Transplanting	33
3.4.4 Shading	34
3.4.5 Watering	34
3.4.6 Fertilizer application	34

3.4.6.1 Basal fertilizer	34
3.4.6.2 Top dressing	35
3.4.7 Pest and Disease control	35
3.4.8 Weed control	36
3.5 Measurements and Observations	36
3.5.1 Yield estimation	36
3.5.2 Flowering Days	36
3.5.3 Canopy height	36
3.5.4 Canopy width	36
3.5.5 Fruits per plant	37
3.5.6 Fruit length	37
3.5.7 Fruit weight	37
3.5.8 Fruit girth	37
3.6 Statistical analysis	37
<b>CHAPTER 4</b>	
4.0 RESULTS AND DISCUSSION	38
4.1 Characters of agronomic importance	38
4.1.1 Canopy height at 50% flowering	39
4.1.2 Canopy height at 100% flowering	42
4.1.3 Canopy height at first harvest	43
4.1.4 Canopy width at 50% flowering	44
4.1.5 Canopy width at 100% flowering and first harvest	44
4.1.6 Days to 50% and 100% flowering	45
4.1.7 Fruit length	47
4.1.8 Fruit girth	48

4.1.9 Fruit weight	49
4.1.10 Number of fruits per plant	49
4.1.11 Yield of mature green pods per plant	50
4.1.12 Disease incidence	51
4.2 Characterization of Chilli varieties	54
4.2.1 Morphological characters of the varieties used in the experiment	55
4.2.1.1 Arunalu	55
4.2.1.2 KA-2	56
4.2.1.3 MI-2	57
4.2.1.4 PC-1	58
4.2.1.5 Wanni miris	59
4.2.1.6 ACC# 2194	60
<b>CHAPTER 5</b>	
5.0 CONCLUSION	62
<b>PLATES</b>	65
<b>LITERATURE CITED</b>	74
<b>APPENDIX</b>	