

**AGRONOMIC SUPERIORITY OF LOCAL F1 HYBRID VARIETIES
OF TOMATOES (*Solanum lycopersicum* L.) OVER
COMMERCIAL COUNTERPARTS**



By

D.L.W. S. Geethika Kumari



FTC300

Main Library, Eastern University, Sri Lanka

Department of Biosystems Technology

Faculty of Technology

Eastern University, Sri Lanka

Chenkalady

2026

ABSTRACT

Tomato (*Solanum lycopersicum* L.) is a nutritionally important vegetable crop, and the development of high-performing cultivars is essential to enhance productivity and meet consumer demand. This study was conducted at the Research and Development Farm of Onesh Agri (Pvt) Ltd., Giriulla, to evaluate 70 newly developed F1 hybrids alongside five commercial varieties (Padma, Platinum, Rajitha, KC-1, and Thilina) under both poly tunnel and open-field conditions. Agronomic and yield-related traits were recorded, and hierarchical cluster analysis grouped the hybrids into five clusters under poly tunnel conditions and three clusters under open-field conditions. In the open field, hybrids TOH089 (4487.83 ± 323.39 g), TOH127 (4144.00 ± 846.16 g), TOH096 (4014.00 ± 167.59 g), TOH063 (4028.69 ± 335.18 g), TOH128 (3789.67 ± 393.52 g), TOH075 (3147.39 ± 183.10 g), TOH050 (3563.28 ± 374.32 g), TOH029 (3844.39 ± 350.15 g), TOH072 (3717.78 ± 461.72 g), and TOH081 (3709.50 ± 345.09 g) exhibited superior yield performance over commercial check, Platinum F1 (2009.08 ± 410.50 g). Under poly tunnel conditions, TOH098 (2623.7 ± 383.95 g), TOH107 (3614.00 ± 461.00 g), TOH128 (2742.33 ± 263.83 g), TOH096 (2506.00 ± 280.38 g), TOH086 (3022.00 ± 212.00 g), TOH036 (2220.00 ± 928.00 g), TOH081 (2569.00 ± 569.47 g), TOH057 (2611.33 ± 306.31 g), TOH083 (3138.33 ± 162.46 g), and Padma (3190.00 ± 50.39 g) ranked highest yield. Notably, TOH081, TOH096, and TOH128 consistently performed well across both environments. These elite hybrids represent strong candidates for commercial cultivation and valuable breeding materials for future improvement of tomato productivity, adaptability, and sustainability in Sri Lanka.

Keywords: Cluster analysis, F1 hybrids, morphology, *Solanum lycopersicum* L., yield

TABLE OF CONTENTS

DECLARATION.....	iii
DEDICATION.....	iv
ACKNOWLEDGMENT	v
ABSTRACT	vi
TABLE OF CONTENTS	vii
LIST OF FIGURES	ix
LIST OF TABLES.....	x
LIST OF ABBREVIATIONS.....	xi
CHAPTER 01	1
INTRODUCTION	1
1.1 Background.....	1
1.2 Problem Statement.....	1
1.3 Problem Justification	3
1.4 Objectives	4
CHAPTER 02	5
LITERATURE REVIEW	5
2.1 Origin and Distribution.....	5
2.2 Scientific Classification of Tomato (<i>Solanum lycopersicum</i> L.)	5
2.3 Botanical Description of Tomato Plant.....	6
.....	8
2.4 Domestication	8
2.5 Importance of Tomato	9
2.6 Tomato Production and Consumption	10
2.7 Released Varieties of Tomato in Sri Lanka (DoA).....	11
2.8 Problem Related to Tomato Cultivation in Sri Lanka	12
CHAPTER 03	14
METHODOLOGY	14
3.1 Site Selection	14
3.4 Media Preparation and Nursery Management	14
3.5 Experiment 1- Cultivation Under Poly Tunnel Conditions	15
3.6 Experiment 2 - Cultivation Under Open Field Conditions	15
3.7 Crop Management Practices	16

3.8 Data Collection	16
3.9 Morphological Characters.....	16
3.10 Yield Traits	17
3.11 Statistical Analysis.....	18
CHAPTER 04	19
RESULTS AND DISCUSSION	19
CHAPTER 05	42
CONCLUSION.....	42
RECOMMENDATIONS	44
REFERENCES	45
APPENDICES	51