



**BIOCHEMICAL RESPONSES OF SOIL MOISTURE DEFICIT
STRESS ON SELECTED TOMATO (*Lycopersicon esculentum*
Mill.) CULTIVARS DURING THE FLOWERING STAGE**

BY

MEERA SAHIB KAMILA BEHAM



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DEPARTMENT OF AGRICULTURAL BIOLOGY

FACULTY OF AGRICULTURE

EASTERN UNIVERSITY

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ABSTRACT

There is a need to utilize the water efficiently and effectively because water availability is scarce in the dry zone of Sri Lanka. Tomato is grown in the Batticaloa district to a limited extent; the yield is low because, growth of tomato is highly susceptible to moisture and heat stress especially during the 'Yala' season. This experiment was conducted in the Agronomy farm of the Eastern University of Sri Lanka, which is located in the Batticaloa district. Studies were conducted to determine the biochemical responses of moisture stress on tomato cultivars; 'Roma', 'Thilina' and 'KC-1' during the flowering stage and to find out the most suitable cultivar which could resist moisture stress in order to sustain the yield. This experiment was arranged in the Randomized Complete Block Design with six treatments and four replications. Moisture stress was imposed to the plants for a period of six days in each treatment during the flowering stage. The control plants were watered daily to field capacity.

The results showed that there was an interaction between cultivars and stress factor in the case of proline, chlorophyll a, lycopene and yield. But, there was no interaction between cultivars and stress factor in the case of chlorophyll b, Total Soluble Solids, vitamin C, acidity and pH. Also the proline and lycopene content were significantly higher and chlorophyll a content was significantly lower in the stressed plants than the control treatments. Slight variations were observed in the vitamin C, total soluble solids, acidity and pH of the fruits irrespective of the type of cultivars. The 'KC-1' cultivar stressed during the flowering stage showed the highest percentage of free proline and lycopene contents and lowest percentage of total chlorophyll content than those of 'Roma' and 'Thilina'.

Moisture stress during the flowering stage of 'KC-1' cultivars showed the lowest percentage of yield reduction and 'Thilina' cultivar showed the highest percentage of yield reduction. This reduction mainly attributed to reduced number of flowers and fruit size when the stress was imposed during the flowering stage. 'KC-1' cultivar was able to tolerate heat stress and able to conserve more moisture in the cells. This would have been the reasons for the highest yield in 'KC-1' cultivar of tomato under moisture stress conditions. Hence, considering the biochemical responses and yield of selected tomato cultivars to moisture stress, 'KC- 1' appears to be the most tolerant to drought among the cultivars included in this investigation.

TABLE OF CONTENTS

	Page No
ABSTRACT	i
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF PLATES	ix
CHAPTER 1 INTRODUCTION	01
CHAPTER 2 LITERATURE REVIEW	06
2.1 A brief description of tomato	06
2.1.1 Origin and distribution	06
2.1.2 Taxonomy	07
2.1.3 Botanical description of tomato plant	07
2.1.4 Characteristic features of tomato cultivars	09
2.1.4.1 Thilina	09
2.1.4.2 KC-1	09
2.1.4.3 Roma	09
2.1.5 Important and uses of tomato	10
2.1.6 Nutritional composition	11
2.2 Production level of tomato	12
2.3 Water relation of tomato	12
2.3.1 Water Requirements and Water uptake	12
2.3.2 Effect of moisture stress	13
2.4 Bio chemical effect of moisture stress	15

2.4.1 Effect on proline content	16
2.4.2 Effect on Chlorophyll content	17
2.4.3 Effect on Ascorbic Acid content	18
2.4.4 Effect on Total soluble solids	19
2.4.5 Effect on Lycopene	20
2.4.6 Effect on Acidity	21
2.4.7 Effect on pH	21
2.5 Yield	22
CHAPTER 3 MATERIALS AND METHODS	23
3.1 The experimental site	23
3.2 Agronomic practices	23
3.2.1 Seed selection	23
3.2.2 Nursery management	24
3.2.3 Land preparation	24
3.2.4 Transplanting	25
3.2.5 Experimental design	25
3.3 Crop management	27
3.3.1 Irrigation	27
3.3.2 Fertilizer application	27
3.3.3 Weeding	27
3.3.4 Pest and disease control	27
3.3.5 Rain shelters	28
3.3.6 Harvesting	28
3.4 Bio chemical determination	28
3.4.1 Free proline content	28

3.4.2 Chlorophyll content	31
3.4.3 Vitamin C (Ascorbic acid) content	33
3.4.4 Total Soluble Solids	34
3.4.5 Acid content	35
3.4.6 pH content	36
3.4.7 Lycopene content	36
3.5 Yield	37
3.6 Analysis of data	37
CHAPTER 4 RESULTS AND DISCUSSION	38
4.1 General appearance of plants	38
4.1.1 Regularly watered plants	38
4.1.2 Water stressed plants	38
4.2 Biochemical effects	38
4.2.1 Proline content	38
4.2.2 Chlorophylls a and b contents	41
4.2.3 Ascorbic acid content	44
4.2.4 Total Soluble Solids	46
4.2.5 Lycopene content	48
4.2.6 Acidity and pH	51
4.3 Yield	53
CHAPTER 5 CONCLUSIONS	57
SUGGESTIONS FOR FUTURE STUDIES	58
REFERENCES	59