

**MORPHOGENESIS OF *Capsicum annum L.* IN RICE WATER  
TISSUE CULTURE MEDIA**

**TUAN SITI NUR HIDAYAH BINTI TUAN MOHAMED**

**Final Year Project Report Submitted in  
Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science (Hons.) Biology  
in the Faculty of Applied Sciences  
Universiti Teknologi MARA**

**JANUARY 2017**

## ABSTRACT

### MORPHOGENESIS OF *Capsicum annuum L.* IN RICE WATER TISSUE CULTURE MEDIA

This study is specifically concerned about the growth of *Capsicum annuum L.* in new introduced rice water media. The problem statement of this research is to increase production of this *Capsicum* species and to produce virus-free plant. The objective of this study is to investigate seed germination rate in different ratio of rice water in MS media. Secondly, to study the growth and morphology changes of *Capsicum annuum L.* in rice water media with different concentration of hormone NAA and BA. Last objective is to identify the presence of callus during *Capsicum annuum L.* morphogenesis in rice water media contain hormone. Five media treatments were used in this study which were Treatment A as control that contain 100% rice water media, Treatment B contain 70% MS media with 30% rice water, Treatment C contain 50% of MS media and rice water, Treatment D contain 70% of rice water and 30% of MS media and Treatment E contain 100% of rice water media. For hormone media treatments, five treatments are being used in which each treatment contain different concentration of NAA and BAP. The findings from this study showed that rice water media showed the same effect as the MS media on the tissue culture of *Solanum lycopersicum* where the germination day and frequency of germination is the highest than the others. As a conclusion, in the future, rice water media could replace the usage of MS media in the tissue culture of *Solanum lycopersicum* because the use of rice water is more cost-effective. However, more research and study should be done on the rice water to find out the effect of rice water to the other species of plants.

## TABLE OF CONTENTS

	PAGE
<b>ACKNOWLEDGEMENTS</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	v
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>ABSTRACT</b>	ix
<b>ABSTRAK</b>	x
	1
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Significance of the Study	4
1.4 Objectives of the Study	5
<b>CHAPTER 2: LITERATURE REVIEW</b>	6
2.1 <i>Capsicum annum L.</i>	6
2.1.1 Taxonomy	6
2.1.2 Medicinal value	7
2.1.3 Economical value	7
2.1.4 Seed structure	8
2.1.5 Plantation problem	9
2.2 Seed Culture	9
2.3 Plant Tissue Culture	10
2.4 Media Culture	11
2.5 Hormones	12
2.6 Rice Water Media	13
2.7 Callus	14
<b>CHAPTER 3: METHODOLOGY</b>	15
3.1 Materials	15
3.1.1 Raw materials	15
3.1.2 Chemicals	15
3.1.3 Apparatus	15
3.2 Methods	16
3.2.1 MS media preparation	16
3.2.2 Rice water media preparation	16
3.2.3 Culture media preparation with hormones	17
3.2.4 Sterilization of <i>Capsicum annum L.</i> seeds	18
3.2.5 Seed culture of <i>Capsicum annum L.</i> seeds	19

3.3	Statistical Analysis	19
<b>CHAPTER 4: RESULTS AND DISCUSSION</b>		<b>20</b>
4.1	Seed Germination of <i>Capsicum annuum L.</i>	20
4.2	Morphogenesis	23
4.2.1	Formation of leaves	24
4.3	Callus Formation	25
<b>CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS</b>		<b>26</b>
<b>CITED REFERENCES</b>		<b>27</b>
<b>APPENDICES</b>		<b>31</b>
<b>CURRICULUM VITAE</b>		<b>34</b>

## LIST OF FIGURES

FIGURE	TITLE	PAGE
1.1	<i>Capsicum annuum L.</i> plant	4
4.1	First day germination of <i>C. annuum L</i> in treatment E	22
4.2	Graph of frequency of germination in different types of treatment	23
4.3	Formation of leaves of <i>Capsicum annuum L</i>	23
4.4	No presence of callus in <i>Capsicum annuum L.</i> seed culture	25
4.5	Absence of callus in <i>Capsicum annuum L.</i> seed culture	26