

ANALYSIS OF SPANISH AND GERMAN AND
FRUITED AND UNFRUITED
(*CANARIAS COMUSUS*)

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Manipulation of seawater for growth and proliferation of
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MANIPULATION OF SEA WATER IN GROWTH AND PROLIFERATION OF
PINEAPPLE (*ANANAS COMUSUS*).

By
Melati Binti Nordin

Research Report submitted in partial fulfillment of
the requirements for the degree of
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KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
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**JABATAN SAINS BIOLOGI
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**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **MANIPULATION OF SEAWATER FOR GROWTH AND PROLIFERATION OF PINEAPPLE (*Ananas comusus*)** oleh Melati binti Nordin, no. matrik: UK8595 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains (Sains Biologi), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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TABLE OF CONTENT

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF ABBREVIATIONS	ix
LIST OF APPENDICES	x
ABSTRACT	xi
ABSTRAK	xii
CHAPTER 1 INTRODUCTION	1
1.1 Introduction	1
1.2 Importance of Study	2
1.3 Objectives	3
CHAPTER 2 LITERATURE REVIEW	4
2.1 <i>Ananas comusus</i>	4
2.1.1 Taxonomy and morphology	4
2.1.2 <i>Ananas comusus</i> propagation	5
2.2 Seawater	5
2.3 Salinity	6
2.4 Macro and Micro Nutrient Uptake	7

2.5	Plant Tolerant to Salinity	8
2.5.1	Plant salt tolerant	8
2.5.2	Mechanism of salt tolerance in plant	9
2.5.3	Ion regulation and compartmentalization	10
2.5.4	Osmotic adjustment	11
2.6	Iron EDTA Solution	12
 CHAPTER 3 METHODOLOGY		 14
3.1	Source of Plant Material	14
3.2	Multiplication of Plantlets in MS BAP Media	14
3.3	Treatment with Seawater Based Media	15
3.4	Quantification of Potassium and Sodium	15
3.4.1	Extraction of potassium and sodium	15
3.4.2	Measurement of Potassium and Sodium by flame photometer	16
3.5	Data Analysis	17
 CHAPTER 4 RESULTS		 18
4.1	Growth	18
4.2	Proliferation	20
4.3	Sodium and Potassium ratio	22
 CHAPTER 5 DISCUSSION		 24

CHAPTER 6 CONCLUSIONS	29
REFERENCES	30
APPENDICES	35
CURICULUM VITAE	43

LIST OF TABLES

Table		Page
Table 3.3	Experimental design	15

LIST OF FIGURES

Figure		Page
Figure 2.5.2	Biochemical functions associated with tolerance to plant salt stress	11
Figure 4.1	Effect of salinity and EDTA on fresh weight of <i>Ananas comusus</i>	19
Figure 4.2	Effect of salinity and EDTA on proliferation of <i>Ananas comusus</i>	21
Figure 4.3	K ⁺ and Na ⁺ ratio plant in different EDTA	23

LIST OF ABBREVIATIONS

BAP	Benzylaminopurine
cm	Centimeter
EDTA	Ethylenediaminetetraacetic acid
g	Gram
K ⁺	Potassium
Mg	Milligram
Mg/L	Milligram per liter
MgSO ₄ .7H ₂ O	Magnesium sulfat heptahydrate
ml	Milliliter
MS	Murashige & Skoog culture media
Na ⁺	Sodium
NaCl	Natrium Chloride
ppm	Part per million
ppt	Part per trillion
ROS	Reactive Oxygen Species
(NH ₄)NO ₃	Ammonium Nitrate
μg/ml	Microgram per milliliter

LIST OF APPENDICES

	Page
A1 Murashige and Skoog (1962) media	36
A2 Effect salinity and EDTA on growth of <i>Ananas comusus</i>	37
A3 Effect salinity and EDTA on proliferation in <i>Ananas comusus</i>	38
A4 Correlations between K ⁺ and Na ⁺ in sub cell	39
A5 Growth data	40
A6 Proliferation data	41
A7 K ⁺ /Na ⁺ ratio in sub cell	42

ABSTRACT

An experiment had been done to develop a sea water based media for growth and proliferation of pineapple (*Ananas comosus* N36). A series of salinities of seawater 5 to 30ppt HAVE been supplemented with 1.65g/l (NH₄)NO₃, 0.37g/l MgSO₄.7H₂O, 30g/l sucrose and 10mg/L BAP. The media were also added with EDTA at concentration of 0, 0.05, 0.10 or 0.15g/l respectively. MS media with 10mg/l BAP was used as control. The number of new plantlets and weight of each plantlet were measured every week interval for five weeks. After five weeks, the concentrations of Na⁺/K⁺ ratio in sub cell were analyzed by using flame photometer. The result show reducing in plant growth by 0.05-folds and proliferation by 0.15-folds in the high salinity more than 15ppt. EDTA was required for growth and proliferation; however there was no significant effect of EDTA concentration. In high salinity, the sub cell of K⁺ was reduced, while Na⁺ was increased. Low salinity did not effect K⁺ concentration; however the Na⁺ was decreased. The ratios of K⁺/Na⁺ were not affected by the addition of EDTA. The results showed *A. comosus* can be proliferated in 10ppt seawater added with 0.10mg/l EDTA with proliferation rate similar to the control.

MANIPULASI AIR LAUT KE ATAS PEMBESARAN DAN PERTUMBUHAN

NANAS (*Ananas comusus*)

ABSTRAK

Ujikaji dijalankan untuk menghasilkan media berasaskan air laut untuk pertumbuhan dan proliferasi nanas (*Ananas comusus* N36). Satu siri kepekatan air laut, 5 hingga 30ppt telah ditambah dengan 1.65g/l $(\text{NH}_4)\text{NO}_3$, 0.37g/l $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, 30g/l sukrosa dan 10mg/l BAP. Media-media juga telah dibekalkan dengan EDTA pada kepekatan 0, 0.05, 0.10 atau 0.15g/l masing-masing. Media MS dengan 10mg/l BAP telah digunakan sebagai kawalan. Bilangan anak pokok dan berat setiap pokok diukur setiap minggu selama lima minggu. Selepas lima minggu, nisbah kepekatan Na^+/K^+ di dalam sub sel telah dianalisa menggunakan flamefotometer. Keputusan menunjukkan penurunan berat basah sebanyak 0.05 kali ganda dan pertumbuhan sebanyak 0.15 kali ganda di dalam aras kemasinan lebih daripada 15ppt. EDTA diperlukan untuk pertumbuhan dan proliferasi nanas tetapi kepekatan EDTA tidak memberi kesan yang bererti. Di dalam kemasinan yang tinggi, K^+ di dalam sub sel menurun manakala Na^+ telah meningkat. Di kemasinan yang rendah, tiada perbezaan bererti bagi K^+ sebaliknya kepekatan Na^+ telah menurun. Penambahan EDTA tidak memberi kesan pada nisbah K^+/Na^+ di dalam sub sel. Keputusan ini menunjukkan *A. comusus* boleh di biakkan di dalam 10ppt air laut dengan 0.10mg/l EDTA dengan kadar proliferasi yang sama dengan kawalan.