[redacted]

[redacted]

(ANANAS COMOSUS)

MELATI [redacted]

[redacted]

[redacted]

2020

Manipulation of seawater for growth and proliferation of pineapple / Melati Nordin.

Lihat sebelah

MANIPULATION OF SEAWATER 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
Bachelor of Science (Biological Sciences)

Department of Biological Sciences
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2006

This project should be cited as:

Melati, N. 2006. Manipulation of seawater for growth and proliferation of pineapple (*Ananas comusus*). Undergraduate thesis, Bachelor of Science in Biological Sciences, Faculty of Science and Technology Malaysia, Terengganu

JABATAN SAINS BIOLOGI
FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

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.

Disahkan oleh:

.....

Penyelia Utama

Nama: DR. AZIZ BIN AHMAD (Ph.D)
LECTURER
Dept of Biological Sciences
Fakulty of Science and Technology
University Collage of Science
and Technology Malaysia
21030 Kuala Terengganu.

Cop Rasmi:

Tarikh: 27/4/2006

.....

Ketua Jabatan Sains Biologi

Nama: PROF. MADYA DR. NAKISAH BT. MAT AMIN
Ketua
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu.

Cop Rasmi:

Tarikh: 30/4/2006

ACKNOWLEGDEMENTS

I wish to express my gratefulness and appreciation to Allah S.W.T for giving me a chance to complete this final year project research and finished the final report and for giving me chances to complete my studies in KUSTEM.

I would like to express my appreciation to my supervisor, Dr Aziz Ahmad who was responsible to initiate the original concept of this brilliance project and also for the guidance, supervision and knowledge. I am also greatly indebted to all the lab staffs especially Mr. Mazrul for his time and kind cooperation.

It is impossible to measure the contributions made to such an endeavor by one's family, but suffice it to say that without the support, understanding and love of my parents Mr. Nordin Halim and Mrs. Amnah Hussein and my brothers and sisters, the culmination of my life in KUSTEM would not have been impossible. I love you all.

An exceptional credit to all lectures in Biological Department for the knowledge and information during lecture. Also to all staffs in KUSTEM for being very pleasant and not forgetting tribute to all my colleagues in the Biological Sciences course.

Special thanks to my entire friend under the same supervisor with me for being very accommodating and kindly shared their findings. And not forgetting my best friend, Fatmawati Ahmad that happened to be my roommate and did the Final Year Project

under the same supervisor with me for the criticism and advises that impetus my life in KUSTEM and also to all my housemates, Aisyah Syairah, Nurul Hazwani and Che Roslailiy that always ready to lend a hand when I need one during classes and assignments and also to my special friend Mr. Nazri for being such an understanding and considerate person and always be there whenever I need him.

Last but not least an exceptional credit to my beloved friends and my greatest inspirational, Mr. Abdul Rahaman Hamzah for being very compassionate and encouraging me whenever I feel down what's more for helping me all the way through many obstacle in this life with his advises and criticism.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BAP	Benzylaminopurine
cm	Centimeter
EDTA	Ethylenediaminetetraacetic acid
g	Gram
K^+	Potassium
Mg	Milligram
Mg/L	Milligram per liter
$MgSO_4.7H_2O$	Magnesium sulfat heptahydrate
ml	Milliliter
MS	Murashige & Skoog culture media
Na^+	Sodium
NaCI	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

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 $(NH_4)NO_3$, 0.37g/l $MgSO_4.7H_2O$, 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. comusus* 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 $(NH_4)NO_3$, 0.37g/l $MgSO_4.7H_2O$, 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 pertubuhan 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 kamasinan 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.