UNIVERSITI TEKNOLOGI MARA

IN VITRO REGENERATION, ACCLIMATIZATIONAND FRUIT QUALITY ASSESSMENTS OF ROCKMELON (*Cucumis melo*) CV. GLAMOUR

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Applied Sciences

March 2014

AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Rockmelon cv. Glamour (*Cucumis melo*) is a fruit plant which belongs to Cucurbitaceae family that has great economic value, high resistance to diseases and able to produce large fruit. In this research, regeneration protocol through *in vitro* culture technique was developed by using different concentrations of hormones and coconut water (CW). Then, the plantlets were further acclimatized under *ex vitro* condition. Findings showed that nodal explants had successfully shoot regenerated on all media. In all MS media combined with CW and cytokinin, there were synergistic effects on shoot regeneration of explant. The best media for multiple shoots regenerating was obtained from MS medium combined with 0.1 mg/L kinetin and 15% CW (K0.1/15). The medium also gave the best plant growth performance with highest shoots length (2.07±1.47 cm), number of leaves (10.30±6.65) and number of nodal (2.26±1.43). In root induction media, MSO media gave the highest number of roots (10.3±2.41), root length (13.5±2.07 cm) and plantlet length (6.30±1.57 cm). For acclimatization, plantlet grown in vermiculite growth media showed the highest survival rate (81±23.09 %). Plants were further grown and fruits were harvested after 2 to 3 months. Fruit quality assessments resulted no significant differences ($P \geq 0.05$) in the fruit fresh weight, fruit diameter, β-carotene and carbohydrate contents for both grown plants. *In vitro* grown plant did not show abnormalities which might indicate variation or mutation occurrence during the micropropagation procedures. In conclusion, direct shoot regeneration of rockmelon cv. Glamour were successfully constructed and plant had generated same quality level of fruits with *in vivo* grown plant.

ACKNOWLEDGEMENTS

Assalamualikum w.b.t.

First and foremost, I would like to extend my high gratitude and deepest appreciation to my main supervisor, Dr Norrizah Jaafar Sidik from the Biology Department, Faculty of Applied Sciences, UiTM Shah Alam for her kindness, invaluable supervision and suggestions throughout the study until this thesis was completed. Special gratitude goes to my co-supervisor, Dr Shamsiah Abdullah from Faculty of Agriculture of UiTM Shah Alam for all the commitments and motivations to complete this thesis.

Not to forget a note of thanks to the all Biology Lab staffs Pn Zaimah Sangit and En Khairul Amri. A special note of gratitude also goes to En Ahmad Khambali Khalil the postgraduate lab assistant and En Zubir Othman the environment lab assistant for providing facilities, valuable guidance and generous advice in performing my lab works. Words of thank to En Yaseer Suhaimi Mohamad, officer from MARDI for the guidance and assistant in the facilities to accomplish hardening the plant at *ex vitro* and En Zuhri from Invitrotech Sdn Bhd.

To all my friends, especially my housemates, thanks for all the supports, kindness and warm co-operation all this time. May Allah bless all of us and finished our master studies with flying colors.

Not to forget to my love belated father, Mr Hashim bin Mohd, my faithful beloved mother, Mdm Azmah Mohd Din, wonderful siblings Rabiatul Adawiyah, Khadijat-ul-Kurba, Muhammad Nurul Iman, Muhammad Nurul Amal and Mohd Farid Mohd Khotob whom never stop giving me support in completing this thesis. Thanks for all the loves, understanding and encouragement that been given throughout my whole life and research.

Thank You,

Saiyidah Nafisah Hashim

CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND OF STUDY

Melon is known scientifically as *Cucumis melo* and belongs to Curcurbitaceae (gourd family). It is regarded as the most morphologically diverse species in the genus Cucumis (Kirkbride, 1993). There are many varieties of melon such as Persian melon, honeydew, casaba, muskmelon and more. Cantalupensis or reticulatus group of melon are the most cultivated in United States and commonly known as muskmelon. The fruit is easy to distinguish through its aromatic, netted skin structure, flat white seeds and sweet orange flesh color. In Malaysia, muskmelon is commercially known as rockmelon and now had become one of the most economic fruit crops in the east coast states of Malaysia. The growing of muskmelon is a lucrative enterprise and current melon production's technology is aimed at maximum production and profit with minimal increase in cost (Norlia, Syed Mohd, Salleh and Raziah, 1992).

Through continuous improvement on technologies especially genomic application, numbers of research towards fruit quality enhancement had increased. By the selection of high quality genes, new hybrid fruits being produced which included the characteristics needed by the planters and also the consumers (Dias and CS, 1997). For melon fruit, numbers of hybrid melon were successfully generated and had achieved many great improvements especially on the fruit taste, color and skin texture. Rockmelon cultivar (cv.) Glamour is one of the examples of successful genetically hybrid melon. By comparing the seed prices and quality of the fruit with other melon hybrids, rockmelon cv. Glamour seed price is more expensive and the fruit shows more respectful attributes. From previous research done by Hashim, Norrizah, Yaseer, Shamsiah and Asma (2011), rockmelon cv. Glamour exhibits high germination rate, total soluble solid and Vitamin C content than other cultivars such as Sunshine sweet and Honeymoon. This rockmelon cv. Glamour is very well known as it may grow up into large fruit size with sweet, fresh and juicy taste. This cv. had been much recommended by MARDI to be planted by the