PROPAGATION OF SOME ORNAMENTAL PLANTS USING TISSUE CULTURE TECHNIQUE

By

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B.Sc. Agric. Sc. (Horticulture), Ain Shams University, 2005

A thesis submitted in partial fulfillment
of
the requirements for the degree of

MASTER OF SCIENCE

in

Agricultural Science (Ornamental Horticulture)

Department of Horticulture
Faculty of Agriculture
Ain Shams University

2010

Approval Sheet

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Date of Examination: 22 / 5 / 2010

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ACKNOWLEDGEMENTS

All praises are due to God who gave me the support to accomplish this work.

This thesis is dedicated to the late **Prof. Dr. Mahmoud El Sayed Hashem** Professor Emeritus of Ornamental Horticulture, Department of Horticulture, Faculty of Agriculture, Ain shams University for his exerted efforts to achieve this work.

I have the honour to be supervised by **Prof. Dr. Sohair Mohamed El Sayed** Professor Emeritus of Ornamental Horticulture, Department of Horticulture, Faculty of Agriculture, Ain shams University, for the continuous encouragement throughout my study.

Deep thanks to **Prof. Dr. Salah Abd El Aziz Gomaa** Head Researcher Emeritus, Department of Ornamental Plants, Horticulture Research Institute, Agriculture Research Center.

My sincerely appreciation to **Prof. Dr. Faisal Mohamed Saadawy,** Head Researcher Emeritus, Department of Ornamental Plants, Horticulture Research Institute, Agriculture Research Center, for his great efforts in writing and reviewing the manuscript.

Many thanks for **Dr. Mamduoh Ebrahim El-Shamy** Principal of El-Zohrya botanical garden Lab. and research garden lab. For tissue cutlture Horticulture Research Institute, Agriculture Research Center.

I am much indebted to Assistant Professor **Mina Samaan Farag** for his helping me to fulfill this work. I am very thankful to my family which helped me faithfully.

Finally, I feel very obliged to the staff of the tissue culture laboratory of El-Zouhriya Botanical Garden for improvement, for their kind help and guidance throughout the course of this study.

ABSTRACT

Ramez Saber Thabet Eisa: Propagation of Some Ornamental Plants Using Tissue Culture Technique. Unpublished M.Sc. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2010.

Several factors were studied in order to establish an *in vitro* protocol to propagate some rare ornamental plants *Pyracantha fortuneana* (shrubs), *Aegle marmelos* (trees) and *Clerodendrum splendes* (climbers). 0.05% mercuric chloride for 1-3 min was used for each of them initially.

Pyracantha fortuneana explants, treated with 1% sodium hypochlorite for 20 min, achieved the highest survival and lowest contamination percentages. Shoot tips of *Pyracantha fortuneana* explants, inoculated on the establishment medium gave the highest average shooting percentage, whereas the stem nodes inoculated on the same medium showed the lowest shooting percentage.

In addition, 1% sodium hypochlorite for 25 min achieved the highest average survival percentage for the *Aegle marmelos*, however it did not exceed 11.33%, recording the lowest average contamination percentage.

10% of the survived shoot tips of *Aegle marmelos* explants, inoculated on establishment medium, responded positively, while the stem nodes of the same plant showed good result 80%. Adding activated charcoal to *Aegle* multiplication media was effective in overcoming the problem of leaf drop.

Applying sodium hypochlorite at 0.75% for 25 min achieved the highest survival percentage for the *Clerodendrum splendes* explants. 0.5% of the shoot tips inoculated on establishment medium gave shooting response, while 18% of them formed callus. 2% of stem nodes cultured on the same media showed shooting, and 42% formed callus.

Experiment of garlic extract (G.E) as a disinfectant agent for nutrient medium achieved the best significant effect at the last concentration 60%.

Concentration of 20% G.E achieved the highest significant value of proliferated *Pyracantha fortuneana* shoots.

There were no significant differences among the treatments of G.E. on average number of proliferated shoots, shoot length and leaves number of *Aegle marmelos* microshoots.

Meanwhile, there was no significant effect of garlic extract on *Clerodendrum splendens* microshoots.

Murashige and skoog (MS) medium (at 3/4 strength) was generally successful with all studied species. Adding BAP at 1 or 3 mgl^{-1} combined with Kin at 0 mgl^{-1}, 3 mgl^{-1} or 5 mgl^{-1} to the multiplication media resulted in the highest average number of proliferated shoots during the three first subcultures for the *Pyracanhta fortuneana*.

In case of *Aegle marmelos*, a significant effect was observed for the combination of BAP and Kin on averages of proliferated shoots and leaves number was obtained by applying BAP and Kin at 0.5 mgl^{-1}.

Media free of BAP and Kin, or supplied with Kin at 1 or 3 mgl^{-1} were the best for *Clerodendrum splendes* shoot proliferation.

IBA at 3 mgl^{-1} for *Pyracantha fortuneana* microshoots was the best in order to enhance both rooting percentage and the number of roots/shoot.

In the same concern, using 0.5 mgl^{-1} IBA to the *Aegle marmelos* rooting medium achieved the highest averages of rooting percentage, number of roots and root length.

The produced *Pyracantha fortuneana* plantlets were acclimatized successfully with a survival percentage of 65-70. The same record was obtained in case of *Aegle marmelos* plantlets with 60-65 survival percentage.

Key words: *Pyracantha fortuneana*, *Aegle marmelos*, *Clerodendrum splendens*, Tissue culture, Microshoots, Garlic extraction, Multiplication, Rooting, Acclimatization.

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