

**MAJOR PRACTICE IN MICROPROPAGATION OF *Medinilla* spp. AT
BENGUET STATE UNIVERSITY, LA TRINIDAD, BENGUET**

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This major practice report entitled “**MAJOR PRACTICE IN MICROPROPAGATION OF MEDINILLA (*Medinilla* spp.) AT BENGUET STATE UNIVERSITY**”, prepared and submitted by **KATRINA JOYCE M. LACSON** in partial fulfillment of the requirements for the degree Bachelor of Science in Agriculture (Crop Science) is hereby accepted.


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BIOGRAPHICAL SKETCH

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TABLE OF CONTENTS

	PAGE
TITLE PAGE	i
APPROVAL SHEET	ii
BIOGRAPHICAL SKETCH	iii
ACKNOWLEDGEMENT	iv
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF APPENDIX TABLE	xii
LIST OF APPENDIX FIGURE	xiv
LIST OF APPENDIX GUIDELINES	xv
ABSTRACT	xvi
INTRODUCTION	1
Importance of the Major Practice	1
Objectives of the Major Practice	3
Time and Place of the Major Practice	3
REVIEW OF RELATED LITERATURE	4
History	4
Ecological Management of <i>Medinilla</i>	5
Watering	5

Insects	5
Temperature and Lighting Condition	5
Transplanting	6
Fertilizing	6
Micropropagation of <i>Medinilla</i>	7
Growth Regulators	9
METHODOLOGY	13
Experiment 1: Inoculation of <i>Medinilla</i>	13
Collection of Explants	14
Preparation of Explants	14
Preparation and Sterilization of Explants	15
Preparation of Cultured Media	15
Culture Establishment or Inoculation of Explants	20
Experimental Design and Treatment	20
Experiment 2: Mericlone and Rooting of <i>Medinilla</i>	22
Proliferation Stage	23
Rooting Stage	23
Experimental Design and Treatments	23
Experiment 3: <i>Ex-vitro</i> Acclimatization of <i>Medinilla magnifica</i> plantlets	25
Experimental Design and Treatments	25
Schematic diagram in soil medium sterilization	26

Soil Media Sterilization	27
Preparation and Sterilization of In-vitro Cultured <i>Medinilla</i>	27
Transplanting of Rooted Plantlets	27
Maintenance of Plantlets	27
Data Gathered	28
RESULT AND DISCUSSION	29
SUMMARY AND CONCLUSION	38
PROBLEMS AND RECOMMENDATION	41
LITERATURE CITED	42

LIST OF TABLES

TABLE		PAGE
1	Number Of Inoculated Bottles	29
2	Percent Contamination	30
3	Days To Root Formation	30
4	Number Of Shoot Produce	31
5	Initial Data Of Acclimatization	36
6	Weekly Growth Increment	37

LIST OF FIGURES

FIGURE		PAGE
1	Schematic diagram of Medinilla embryo culture from collection of explants to isolation of inoculated bottles	16
2	Schematic diagram in preparation of stock solution	17
3	Schematic diagram in Media preparation	19
4	Schematic diagram in soil media sterilization	26
5	Percent contamination of inoculated bottle	32
6	Percent survival	33
7	Number of nodes at 30 days after mericlone	34
8	Number of days to root formation	35
9	Root length	36
10	Total number of roots produce	37
11	Plant height	38
12	Number of shoots	38
13	Initial data of acclimatization	40

LIST OF APPENDIX TABLE

TABLE		PAGE
1	List Of Activities	53
2	Sample Table For Data Gathering	53
3	Composition Of Murashige And Skoog Media	53
4	Percent Contamination	54
5	Percent Survival	54
6	ANOVA table for number of nodes	54
7	ANOVA days to rooting	54
8	ANOVA root length	54
9	ANOVA number of roots	54
10	ANOVA plant height	55
11	ANOVA number of roots produce	56

LIST OF APPENDIX FIGURES

FIGURE		PAGE
1	Removal of contaminated cultured media in the bottle	54
2	Cooking of Contaminated Cultured Media	54
3	Putting papers in the Bottle Cups	55
4	Weighing of chemicals	55
5	Dillution of chemicals	56
6	Stock solution making	56
7	Made Macro solution	57
8	Maintaining Ph level	57
9	Cooking of Stock solution	58
10	Putting cooked cultured media into the bottles	58
11	Washing of bottles	59
12	Collection of Chrysanthemum	59
13	Collection of African violet	60

**APPENDIX TABLE
GUIDELINES**

GUIDELINES		PAGE
1	Laboratory guidelines	45
2	Laboratory code of practice	46

ABSTRACT

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Major practice in Micropropagation of *Medinilla* spp. at Benguet State University

Venue: **Regional Tissue Culture Laboratory**
Benguet State University
Cabanao, Balili, La Trinidad Benguet

Adviser: **Prof. Pacifico T. Vizmonte, Jr.**

The major practice in micropropagation of *Medinilla* spp. was conducted at the Regional Tissue Culture Laboratory Benguet State University (BSU), Barangay Cabanao, Balili, La Trinidad Benguet from December 21, 2016 to January 21, 2017. The objective of the major practice (MP) was to enable the MP students to acquire firsthand experience in tissue culture technologies on ornamental particularly in *Medinilla*. The specific objectives were, to know the specific procedures in tissue culture and gain knowledge on both experiential and technical areas, to Conduct mini experiments that will enable the major practice students to: a) develop expertise in inoculation procedures b) acquire more precise ability and technical knowledge in preparing stock solutions c) gain hands on

experience in mericlone or subcloning of *Medinilla* d) become familiar with in *ex-vitro* acclimatization of plantlets grown in *in-vitro*.

During the major practice, the student was exposed to inoculation, mericlone and acclimatization of *Medinilla*. Activities undertaken were preparation of stock solution, preparation of cultured media, cooking of cultured media, sterilization of cultured media, sterilization of contamination, collection of explants, sterilization of explants, inoculation, mericlone, and acclimatization.

LITERATURE CITED

- Anonymous (2012) plant care <http://www.medinilla.ca/plant-care.html> retrieved MARC H 03,2017
- Anonymous (2013), Method of ovary culture and tissue culture rapid propagation of *medinilla magnifica*. Nov. 13, 2016.
- CHATURVEDI, (2007).Cloning of medicinal plants P.946
- Crane, J.C And Van Overbeek. 1965 Kinin Induced Parthenocarpy in Figs. *Science*,47: 1468-1469
- Debergh PC and Maene LJ (1981), A scheme for commercial propagation of ornamental plants by tissue culture. April 1981, Vol.14(4):335–345; Retrieved on Dec. 16, 2016
- Devlin, R. 1977. *Plant Physiology* Third Edition New York: Litton Education Publishing Incorporation Pp.495-497
- Elinorovololona RN and Martial EL (2014), Effects of growth regulators 6-Benzylaminopurine and 2-Naphtalene Acetic Acid on the in vitro shoot multiplication from nodal segment of *Medinilla mandrakensis* (Melastomataceae).
- Fernández H and Revilla M (2013), *Plant Cell, Tissue and Organ Culture*. 73: 1; Retrieved on Nov. 14, 2016
- H.P. Singh, S. Uma, R. Selvarajan and J.L. Karihaloo (2011). Micropropagation for production of quality banana planting material in Asia-Pacific.Asia-Pacific Consortium on Agricultural Biotechnology(APCoAB). P.92.
- LIU, (2007) In vitro propagation of an endangered medicinal plant. *Plant cell reports* volume 26 Issue 3.
- Medina, E. T. 1981. Effect of the interaction of gibberellic acid and Cytokinin on the Flower Formation of *Chrysanthemum*. *Sci. Horticulture*. 5: 161-360
- Miller, C. O. 1956. Similarly of some kinetin and some red light effects. *Plant Physiology Journal*. 31: 318-319

- Mujib A, Banerjee S and Ghosh PD (2013), Tissue Culture Induced Variability in some Horticultural Important Ornamentals: Chromosomal and Molecular Basis-A Review. *Biotechnology*, 12: 213-224; Retrieved on Dec. 17, 2016
- MURASHIGE And SKOOG. 1962. A revised medium for rapid growth and bio-assays with tobacco tissue cultures. *Physiology Plant*. 15: 473
- Nakayama, Y. A. 1962. Antagonism of Kinetin and red light on iaa in the flowering of *Pharbitis* Seedlings. *Phyton*. 19: 43-48
- PATENA, (2008). Tissue culture of mango. Retrieved on May 10,2017 From http://www.pcaarrd.dost.gov.ph/home/momentum/mango/index.php?option=com_content&view=article&id=1326:tissue-culture-of-mango&catid=37
- PCARRD, 1975. Coconut Production. The Philippine Council for Agricultural Research. University of the Philippines, Los Banos, Laguna. Pp.1925
- Ron Determann (2016), Tissue Culture. (<http://atlantabg.org/learn/conservation-efforts/tissue-culture-lab>)
- Snow, R. 1935. Activation of Cambial Growth by Pure Hormone. *New Phytol*. 34:347-360
- TEMJENSANGBA, 2006. In vitro propagation of threatened terrestrial orchid,through immature seed culture. *Indian journal of experimental biology* Volume 44 Issue 9
- THORPE, (2006) History of plant tissue culture. *Methods of Molecular Biology* Volume 318.
- WAHOME,(2005).Propagation of sugarcane using plant tissue culture biotechnology <http://www.uniswa.sz/sites/default/files/research/urs/docs/propagationofsugarcane.pdf>
- Wikipedia. *Medinilla*. <https://en.wikipedia.org/wiki/Medinilla>
- Yan Wang, Dai-Di Feng, Xiao-Bai Li, and Jian-Ping Chen (2015). An effective route for the micropropagation of *Medinilla formosana* through ovary culture in vitro.