

GUIDELINES FOR PREPARING MSc Dissertation and PhD Thesis

Prepared by

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INTRODUCTION

A thesis is the cumulative write-up of the entire MSc and PhD programme, and includes the scientific information and findings from completed work. This guideline is formed with the aim to standardize the format of the thesis during the preparation of MSc and PhD thesis by graduate candidates.

CONTENT OF THE REPORT

The sections are as follows:

1. Title (Front Cover) Page (*refer to Appendix A*)
2. Declaration
3. Acknowledgements
4. Abstract in English and Bahasa Malaysia
5. Table of Contents
6. List of Abbreviations
7. List of Tables
8. List of Figures
9. Introduction ‡
10. Literature Review ‡
11. Materials and Methods ‡
12. Results* ‡
13. Discussion* ‡
14. Conclusion ‡
15. References
16. Appendices (Optional)

* can be combined (*Please refer to your respective supervisor*)

‡ can be combined as individual chapters (*Please refer to your respective supervisor*)

Declaration

In this section, the student must declare the originality of his/her report. This section must be dated and signed by the candidate.

Acknowledgements

An acknowledgement can be included to acknowledge your supervisor, individuals and financial resources, which have contributed towards the completion of your project. However, the acknowledgement should not exceed one page.

Abstract (*refer to Appendix C*)

The abstract must be written in English followed by the Bahasa Malaysia translation. The word ABSTRACT and ABSTRAK should be written using Times New Roman with font size 12 (Bold). The abstract should be a brief summary of the research scope containing the background, research question, general approaches, and findings. The main results (or inferences) obtained should be emphasized.

Key words (OPTIONAL) can be provided at the bottom of the abstract. The maximum number of key words is FIVE (5) only. Abstract should not be more than one page. English and Bahasa Malaysia abstract sections should be separated.

Table of Contents

All sections and their sub-sections (hence, the headings and sub-headings) should be listed appropriately with their associated page numbers. Arabic numeral (1, 2, and 3) for page numbers should begin from the Introduction Section. Roman numeral (I, II, and III) for page numbers is to be used for the Acknowledgements, Table of Contents, List of Abbreviations, List of Tables and List of Figures pages. *Refer to Appendix B.*

Introduction

This section should focus on the brief introduction of the research emphasizing on the reasoning of the problem. References cited should be included to strengthen and support the statement of problem. The objectives of the research also should be included in this part.

Literature Review

This section should be devoted to the critical and relevant review of literature related to the study. Students should use this section to strengthen the background of the study so that the reader will have enough knowledge to understand the research project.

In referring to sources of literature, in-text citations should be included in the main body of text. In-text citation should follow the American Psychological Association (APA) referencing and citation system. This means the last name(s) followed by the year (for example: Jefferson, 2008). In cases of direct quotations, it should be the last name(s) followed by year and then page number (for example: Garfunkel, 2007, p45).

Materials and Methods

Report the materials and methods used in the research. If the method used has a standard protocol, state the method according to the existing protocol. This section should be written in past tense and passive voice style. Paragraph format is preferred over point-form format. Figures and tables can be included wherever necessary.

Results

If the results are abundant, it is advisable to separate this section from the discussion (if it is not appropriate to be combined). Begin this part with a general statement that can draw the attention of the reader to the subsequent statements. Then, support your statements with results from statistical analyses (if any) and the relevant tables and/or figures. Interpret your results in sentence form and expand it with simple and meaningful figures (numbers). In presenting tables and figures, you need to guide the reader to understand the particular table. State the trend, range and significant aspects of the tables or figures you have presented. Do not create situations where the readers have to search for the figures and tables and to make their own assumptions or interpretations. Students should pay close attention to the accurate presentation of their results, and not merely including tables and figures, and furnishing vague description of their data/findings.

For statistical analyses, only report the degree of significance (p value or F value). Do not present all your statistical analyses in the body of text.

Tables and figures should support and aid your report, and should only contain the summary of the data. It should not contain detailed data or extensive amount of raw data. Tables and figures containing detailed and raw data can be included as appendices.

For tables, a caption should be written at the top of the table while for figures a caption should be written at the bottom of the figure.

The captions of the tables and figures should brief descriptions of the contents of the tables and figures. Tables and figures should be positioned in the main text using ‘insertion’ or ‘paste’.

Discussion

This part should present the principles, relationships and general statements drawn **based on the results obtained**. It should contain comparison of results with earlier findings and interpretations of the differences (if any). ***Whenever facts/information from literatures is used, in-text citation should be included.*** Discussions should be strengthened with supporting explanation based on the theories and facts from relevant literatures. Implications and potential applications of the findings can be included. Limitations (if any) and recommendations (where relevant) can also be discussed. Produce discussions that reflect critical thinking on the interpretation results obtained (and analysis thereof) and/or experimental processes carried out. This section should not be just an extended description of the results or paraphrases of the result section.

* The Results and Discussion sections can be combined, whenever deemed appropriate, to facilitate the ease of thesis presentation discussions. Please discuss with your supervisor on the most appropriate format.

‡ The Introduction, Materials and Methods, Results and Discussions sections can be combined, whenever deemed appropriate, when reporting different aspects of the project. Please discuss with your supervisor on the most appropriate format.

Conclusion

This section should be definitive and succinct. In other words, it should only contain a specific and precise conclusion of the study. Aspects for future direction can be stated, but must be concise and focus. This section must NOT contain any in-text citation.

References

All references cited in the text should be recorded. Statements or methods by previous researchers whose authenticity have been acknowledged must be cited. Generally, each reference should contain the following items:

1. Author's name
2. The publication year of the article
3. Title of the article
4. Name of the journal
5. Volume and page

Examples of listing references based on the American Psychological Association (APA) format are as follows:

Journal publication;

Epperson, B. K., & Walter, R. (2001). Geographic pattern of genetic variation in *Pinus resinosa*: Area of greatest diversity is not the origin of postglacial populations. *Molecular Ecology*, 10 (1), 103-111.

Jia, B. H., Li, J. F., & Gu, M. (2007). Two-photon polymerization for three-dimensional photonic devices in polymers and nanocomposites. *Australian Journal of Chemistry*, 60 (7), 484-495.

Book publication;

Bergeron, B. (2002). *Bioinformatics computing*. New Jersey, USA: Pearson Education Inc. and Prentice Hall.

Chapter in book;

Ipor, I. B., Tawan, C. S., Ismail, J., & Bojo, D. (1998). Floristic compositions and structures of forest at Bario Highlands, Sarawak. In G. Ismail, & L. Din (Eds.), *A scientific journey through Borneo: Bario, the Kelabit Highland of Sarawak* (pp. 113-132). Kuching, Malaysia: Pelanduk Publication.

Proceedings;

Nyanti, L., Ismail, N., & Lo, M. L. K. F. (2005). Fish, crustacean and cephalopod fauna and their fisheries of the Paloh mangrove, Rajang Estuary, Sarawak. In A. A. Tuen & I. Das (Eds.), *Wallace in Sarawak – 150 years later. Proceedings of an International Conference on Biogeography and Biodiversity, July 13-15*, (pp. 162-177). Kota Samarahan, Malaysia: Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak.

Online publication;

Myers, M. P., Yang, J., & Stampe, P. (1999, December). Visualization and functional analysis of a maxi-K channel (mSlo) fused to green fluorescent protein (GFP). *Electronic Journal of Biotechnology*, 2 (3). Retrieved March 21, 2000, from <http://www.ejbiotechnology.info/content/vol2/issue3/full/3/index.html>

Bryant, P. (1999). *Biodiversity and conservation*. Retrieved October 4, 1999, from <http://darwin.bio.uci.edu/~sustain/bio65/Titlepage.html>

U.S. Environmental Protection Agency. (2007). *Laws and regulations*. Retrieved July 24, 2007, from <http://www.epa.gov/epahome/lawregs.html>

Every student should consult his/her supervisor on the proper ways to do in-text citation and referencing. For consistency in the faculty, all students should conform to the APA system.

There is no limit on the number of references used, but **web-based** (internet/online) information that is not from online articles of refereed (peer-reviewed) journals **should not exceed 5% of total references used.**

If internet information is used, it must be from valid sources (e.g. government agencies, and accredited academic and research institutions). Reference from internet sources must include the retrieval date and URL address, and a hardcopy of the first page to the webpage should be attached as appendix. Online articles from refereed journals (usually also available in printed version) should be listed according to normal journal paper format. Information from documents, data, or reports that cannot be assessed by the public is considered as unpublished data and should be cited as personal communication or as unpublished data. This applies to information from postgraduate thesis of previous students.

***A note on plagiarism**

In writing the thesis, students must consult their supervisors on issues of quotations, adaptation of information (textual and diagrammatic) from literature, and any other matters pertaining to plagiarism. Plagiarism is defined as any effort/work that directly reproduces the published work of others without adequate acknowledgements. It also includes the direct adaptation or copying of sentences from any reference/literature without citing the source. Except for direct quotations, all statements (or arguments) taken from literature must be paraphrased. All direct quotations and statements taken/adapted from literature must contain citations of the relevant source.

Plagiarism is an act of academic dishonesty. Students can be subjected to disciplinary action.

Appendices (optional)

This section is optional and will depend on the individual thesis content. It contains supplementary illustrative material, original data and quotations too long for inclusion and not immediately essential to an understanding of the subject. The appendices should be labeled alphabetically.

THE FORMAT OF THE MSc and PhD THESIS

1. Language – The thesis should be **written in English**.
2. Margin (A4 size papers: 80 gram) for all pages.
 - The top, bottom, and right margins should be 25 mm
 - The left margin should be 30 mm
 - Page number on bottom and center for each page
3. The line spacing that should be used is **double spacing** including footnotes, lengthy quotations, appendices, and headings and subheadings. **However**, legends and captions for tables and figures, and list of references should be single-spaced.
4. The font type and size for the main body of text should be **Times New Roman, size 12**. Headings and sub-headings should be highlighted in **bold**. Headings should also be in **Title format (with lower case for conjunctions)**.
5. The font type and size for legends and captions of tables and figures should be **Times New Roman, size 11**. Tables and figures should be positioned in the main text using ‘insertion’ or ‘paste’. Only tables and figures with detailed and/or raw data should be included as appendices. If the tables and figures are taken or adapted from others, the appropriate reference sources should be cited.
6. Alignment – all text in the report should be in full alignment (justified alignment).
7. Printing quality – hardcopy of the report should be printed using a printer of publication quality.
8. Cover page (*Please refer to Appendix A*).
9. The first page of the text must contain the title, candidate’s name and abstract (bilingual). The title and student’s name must be written using Times New Roman font size 12 meanwhile abstract can be written using any appropriate font size in order to fit abstracts in each page.

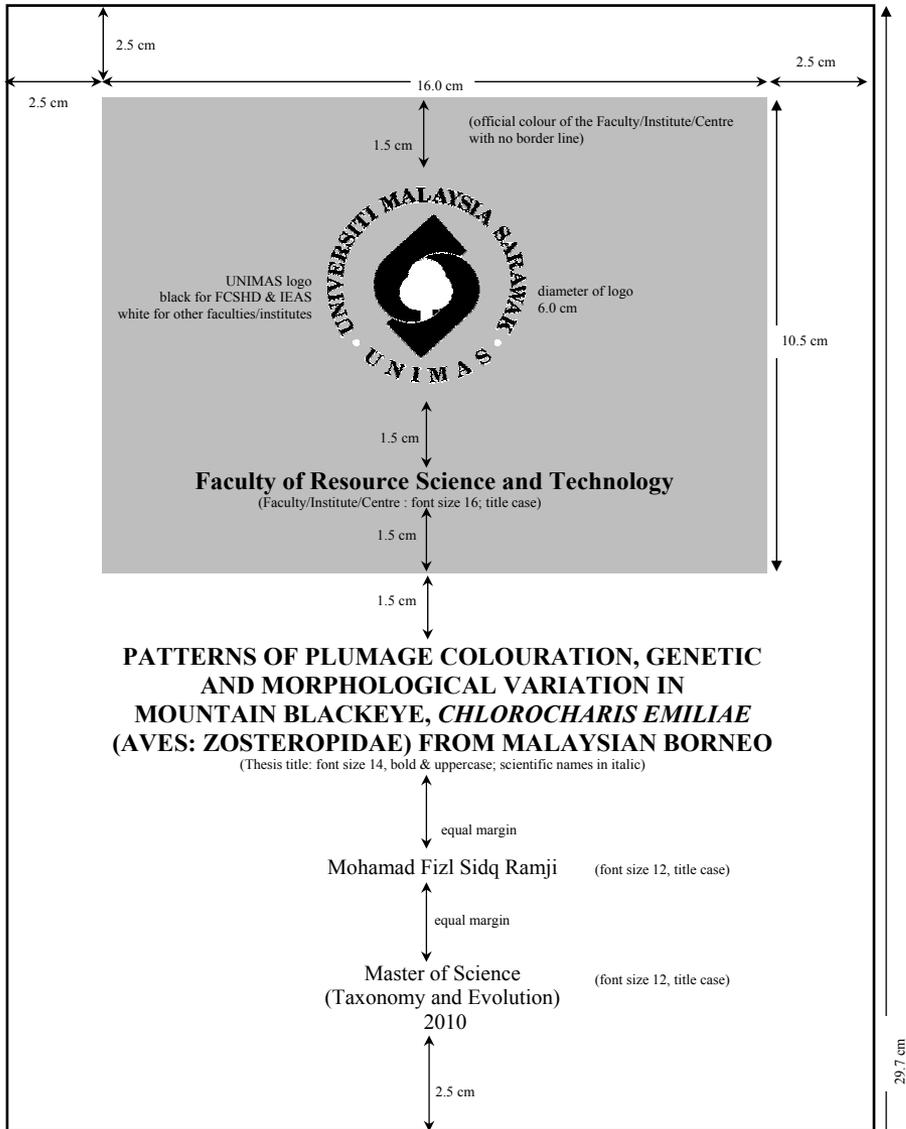
10. The subsequent pages should be written using Times New Roman, font size 12.
11. Pagination- The page numbers should be printed 25 mm from bottom edge and placed in the center. Please use the default font size for the page number.
12. Front Cover Printing and Binding - This part will follow the format provided by Centre for Graduate Studies (CGS) [Graduate Studies Regulations, CGS. 4th Edition]

Please take note that this guideline is to be read with the guideline provided by the Centre for Graduate Studies (CGS) UNIMAS. If there are any conflicts arose from this guideline, the guideline from CGS is referred to as the main reference.

Reference

*GUIDELINES FOR PREPARING FINAL YEAR PROJECT (FYP) FINAL REPORT
STF 3015 – Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, (April
2009, Version 3)*

Appendix A: Example of the front cover



Appendix B: Example of the Table of Contents

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Appendix C: Example of Abstract

Transformation of *Morinda citrifolia* and reconstruction of a promoter tagging cassette

Lee Jong Jen

ABSTRACT

Morinda citrifolia is a plant that has been reported to have a wide range of medicinal properties and other characters such as flowering and fruiting throughout the year. The establishment of an efficient and reliable transformation protocol suitable for *Morinda citrifolia* had been successfully formulated through the use of *Agrobacterium* on direct seed transformation, a tissue culture free approach. A total of 2180 seeds were transformed and sown. The work includes optimization of transformation parameters such as incubation time, bacterial density and temperature, that might affect the efficiency of T-DNA delivery into plant genome. Two types of binary vectors, pGSA1131 and pBI121, were used in the transformation using *Agrobacterium tumefaciens* strain LBA4404. Initial screening for putatively transformed seedlings was done by PCR using primers specific to the reporter gene (*GUS* gene) and selectable marker of the respective vector. Overall transformation efficiency using *Agrobacterium* harbouring pGSA1131 was determined to be 75.95% while 72.27% when using *Agrobacterium* containing pBI121. Further expression studies were conducted through *GUS* gene expression assay and cDNA expression. An alternative transformation method involving floral inoculation was undertaken which gave 90.91% transformation efficiency. Second part of the project involves the construction of a promoter tagging cassette which uses insertional mutagenesis to identify potential promoter or other regulatory sequences. This technique uses the expression of a reporter gene, β -glucuronidase (*GUS*), in mutants as indicator and transfer of this construct into random sites in the genome. The construction of a promoter trapping cassette, containing the modified T-DNA, involved a series of molecular techniques and elements from several vectors such as pGSA1131 and pAGS. Seedlings containing the construct were screened for possible novel genes or regulatory elements near the T-DNA insertion sites in the plant genome via DNA-walking and inverse-PCR techniques.

Transformasi *Morinda citrifolia* dan Rekonstruksi Kaset Gen untuk Penandaan Promoter

Lee Jong Jen

ABSTRAK

Morinda citrifolia ialah sejenis tumbuhan yang mempunyai nilai yang luas dalam bidang perubatan dan aksara lain seperti berbunga serta berbuah sepanjang tahun. Kajian untuk pendirian suatu metod transformasi mengkudu secara efisien tanpa kultur tisu telah berjaya dijalankan dengan berperantaraan *Agrobacterium* dan transformasi biji secara langsung. Sebanyak 2180 biji benih telah ditransformasikan dan ditanam. Kerja pengoptimuman parameter protocol transformasi antara lain masa pengeraman, densiti bakteria dan suhu, yang dilaporkan adalah antara faktor-faktor yang mempengaruhi perpindahan T-DNA ke dalam genom tumbuhan. Dua jenis vektor binari yang digunakan, iaitu pGSA1131 dan pBI121, dalam transformasi tumbuhan berperantaraan *Agrobacterium tumefaciens* strain LBA4404. Saringan awal untuk mengenalpasti transforman putatif telah dijalankan dengan analisis tindak balas berantai polimerase (PCR) dengan menggunakan primer-primer spesifik terhadap gen *GUS* dan gen penanda vektor binari. Peratusan keseluruhan efisiensi transformasi berperantaraan *Agrobacterium* yang membawa vektor pGSA1131 ialah 75.95% manakala 72.27% apabila menggunakan *Agrobacterium* yang mengandungi vektor pBI121. Kajian lanjutan menguji pengekspresen gen *GUS* adalah melalui assay protin *GUS* dan ekspresi cDNA. Metod alternatif untuk transformasi telah juga dijalankan iaitu melalui inokulasi bunga dan menghasilkan peratusan efisiensi transformasi sebanyak 90.91%. Bahagian kedua projek merangkumi pembinaan kaset vektor penandaan promoter yang menggunakan prinsip mutasi melalui penyisipan untuk mengenal pasti promoter atau jujukan pengawalan pengekspresan lain. Teknik ini menggunakan pengekspresen gen pelapor, *β -glucuroidase* (*GUS*), sebagai penanda dan pemindahan rawak konstruk ke dalam genom tumbuhan. Pembinaan kaset, yang mengandungi T-DNA terubah, melibatkan penggunaan pelbagai teknik biologi molekul serta elemen-elemen dari beberapa vektor seperti pada pGSA1131 dan pAGS. Penapisan awal anak benih putatif tertransformasi telah dijalankan dengan menggunakan teknik DNA-berjalan dan PCR-terbalik bagi menguji kehadiran gen dan promoter berhampiran kawasan penyisipan T-DNA dalam genom tumbuhan.