

## TABLE OF CONTENTS

	<b>Page</b>
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
บทคัดย่อ	v
LIST OF TABLES	viii
LIST OF ILLUSTRATIONS	ix
ABBREVIATIONS	xi
CHAPTER I INTRODUCTION	1
CHAPTER II LITERATURE REVIEW	3
2.1 Classical methods for genetic variation studies.	6
2.2 Molecular markers for population genetic analysis.	6
2.3 Molecular techniques based on DNA analysis.	10
2.4 Aims of this thesis.	20
CHAPTER III MATERIALS AND METHODS	21
3.1 Instruments.	21
3.2 Inventory supplies.	21
3.3 Chemical reagents.	22
3.4 Oligonucleotide primers.	22
3.5 Sample collections.	24
3.6 DNA extraction strategies.	25
3.7 PCR amplification for RAPDs.	26
3.8 Agarose gel electrophoresis.	27
3.9 Statistical analysis of genetic variation.	27
3.10 Analysis of anti-fungal agent.	28

CHAPTER IV RESULTS	29
4.1 Sample collections.	29
4.2 DNA extraction strategies.	30
4.3 Determination of genetic variation of <i>Alpinia</i> spp. using RAPD analysis.	32
4.4 Analysis of anti-fungal agent.	54
CHAPTER V DISCUSSION	56
CHAPTER VI CONCLUSIONS	61
REFERENCES	62
APPENDIX	69
CURRICULUM VITAE	71

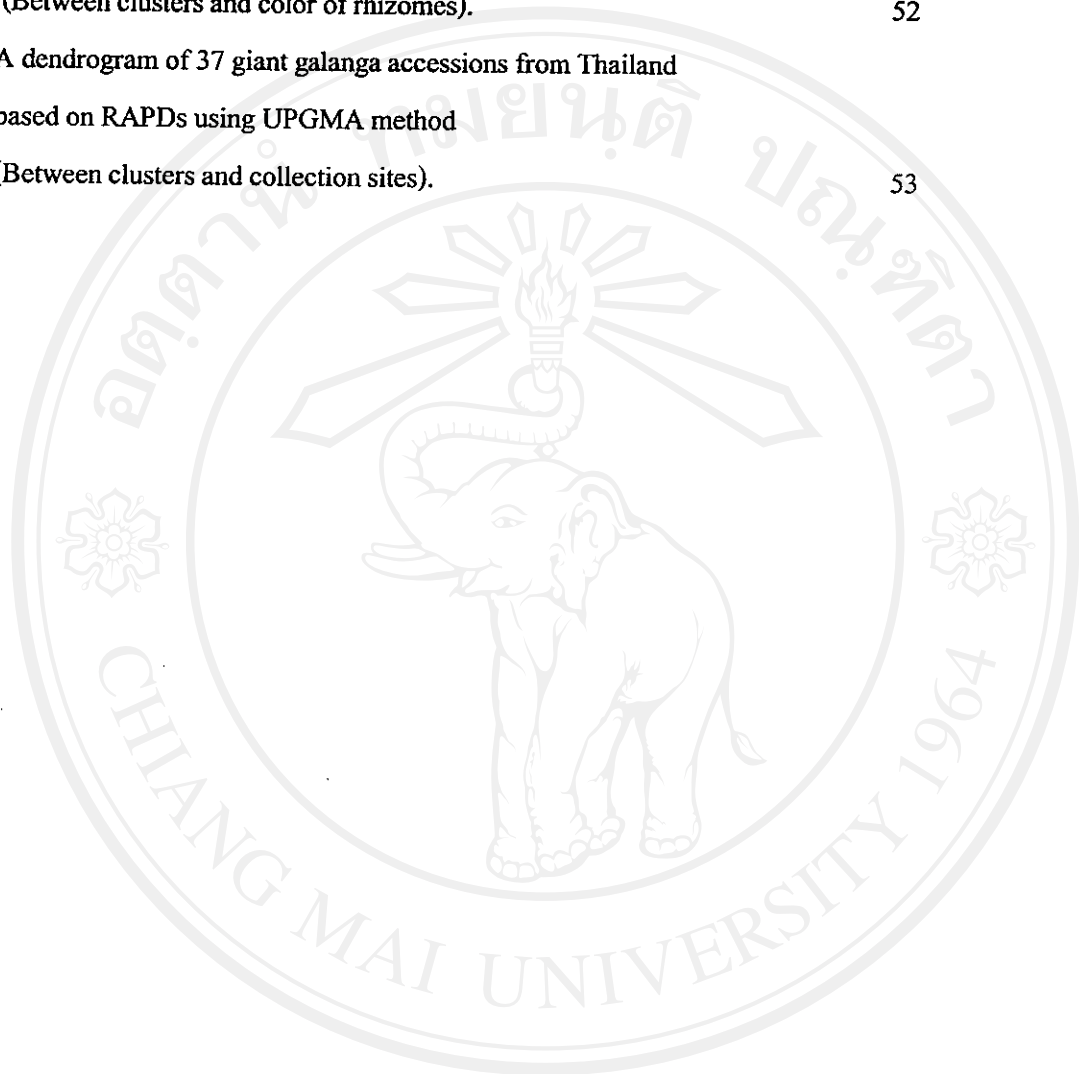
## LIST OF TABLES

Table	Page
2.1 The substance in rhizome and seed of <i>Alpinia galanga</i> .	4
3.1 The sequences of all arbitrary primers in this study for <i>Alpinia</i> spp.	23
3.2 Accessions of giant galanga varieties used in the variation study.	24
3.3 PCR condition.	26
4.1 DNA concentration of giant galanga (37 accessions) using SDS extraction procedure.	30
4.2 The total bands and polymorphic bands of giant galanga (37 accessions) based on RAPD analysis.	32
4.3 Data matrices of giant galanga using OPA20.	34
4.4 Data matrices of giant galanga using OPB18.	36
4.5 Data matrices of giant galanga using OPC09.	38
4.6 Data matrices of giant galanga using OPD02.	40
4.7 Data matrices of giant galanga using OPD11.	42
4.8 Data matrices of giant galanga using OPG13.	44
4.9 Data matrices of giant galanga using OPK12.	46
4.10 Data matrices of giant galanga using OPAX17.	48
4.11 The cluster of giant galanga accession and the quantity of the crude extract.	54

## LIST OF ILLUSTRATIONS

<b>Figure</b>	<b>Page</b>
2.1 Large pre-rRNA genes and their spacer.	9
2.2 The polymerase chain reaction.	14
4.1 Variation of giant galanga in Thailand.	29
4.2 Agarose gel electrophoresis of giant galanga DNA (6 samples) by SDS extraction procedure.	31
4.3 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPA20.	33
4.4 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPB18.	35
4.5 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPC09.	37
4.6 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPD02.	39
4.7 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPD11.	41
4.8 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPG13.	43
4.9 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPK12.	45
4.10 Amplification patterns obtained from 37 giant galanga accessions using RAPD primer OPAX17.	47
4.11 A dendrogram of 37 giant galanga accessions from Thailand based on RAPDs using UPGMA method.	50
4.11.1 A dendrogram of 37 giant galanga accessions from Thailand based on RAPDs using UPGMA method (Between clusters and type of galanga).	51

- 4.11.2 A dendrogram of 37 giant galanga accessions from Thailand  
based on RAPDs using UPGMA method  
(Between clusters and color of rhizomes). 52
- 4.11.3 A dendrogram of 37 giant galanga accessions from Thailand  
based on RAPDs using UPGMA method  
(Between clusters and collection sites). 53



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่  
Copyright© by Chiang Mai University  
All rights reserved

### ABBREVIATIONS

A, T, G, C	= nucleotide containing the bases adenine, thymine, guanine, and cytosine, respectively.
bp	= base pair
°C	= degree Celsius
cm	= centimetre
DNA	= deoxyribonucleic acid
DNTPS	= deoxyribonucleoside triphosphates (dATP, dTTP, dGTP, dCTP)
EDTA	= ethylenediamine tetra acetic acid
HCl	= hydrochloric acid
kb	= kilobase
MgCl <sub>2</sub>	= magnesium chloride
ml	= millilitre
mM	= millimolar
ng	= nanogramme
PCR	= polymerase chain reaction
SDS	= sodium dodecyl sulfate
Tris	= tris (hydroxy methyl) aminomethane
µg	= microgramme
µl	= microlitre
µM	= micromolar
UV	= ultraviolet
V	= volt
W	= watt