



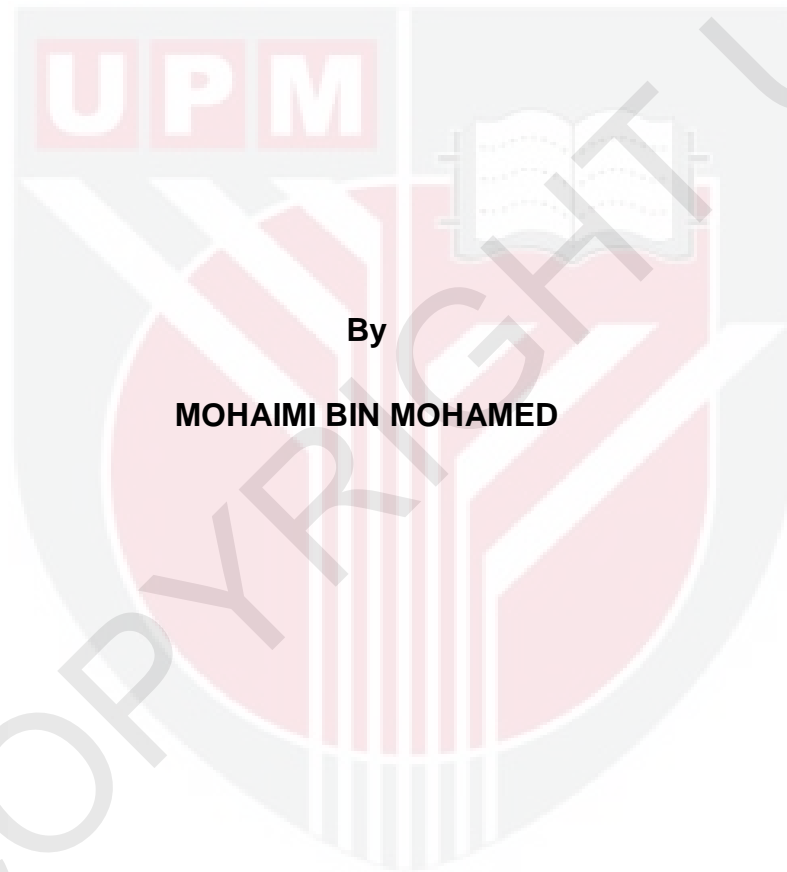
UNIVERSITI PUTRA MALAYSIA

**PHENOTYPIC AND GENOTYPIC VARIATION IN *TENERA*
PROGENIES DERIVED FROM DIFFERENT SOURCES OF
DURA CROSSED WITH *AVROS PISIFERA***

MOHAIMI BIN MOHAMED

FP 2012 15

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By

MOHAIMI BIN MOHAMED

**Thesis Submitted to the School of Graduate Studies, Universiti
Putra Malaysia, in Fulfilment of the Requirements for the Degree
of Master of Agricultural Science**

May 2012

Abstract of their presented to the Senate of Universiti Putra Malaysia
in fulfillment of the requirement for the degree of Master of Agricultural
Science

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MOHAIMI MOHAMED

May 2012

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Faculty : Agriculture

This study was executed to search for new breeding strategies to be employed towards the improvement of elite Deli duras populations from Breeding Population of Restricted Origin (BPRO). The objectives for the study were (i) to estimate phenotypic and genetic variances and heritabilities (broad-sense and narrow sense) in various dura populations crossed to AVROS pisifera, (ii) to estimate phenotypic and genotypic coefficients of variation of the characteristics measured, (iii) to estimate phenotypic correlations among quantitative traits, and (iv) to identify for the characteristics that are unique to each of these dura sources crossed with AVROS pisifera.

Three experiments each consisted of 17, 45 and 15 duras crossed with AVROS pisifera progenies. The Deli duras originated from various sources of Deli

dura BPROs consisted of Ulu Remis *dura*, Johor Labis *dura* and their derivatives. Experiment 1 and Experiment 2 utilized North Carolina Mating Design I while Experiment 3 utilized the bi-parental crosses. All experiments were laid out in Randomised Completely Block Design (RCBD) with four replications and were planted at 8.8m triangular on coastal clay-loam soil in East Estate, Carey Island.

Due to high selection pressure in most of the *dura* populations during their early improvement programmes certain characters found to be more concentrated in different *dura* populations. It is possible to combined two different desirable characters from two different *dura* populations and combinations of more than two characters can be carried out by utilizing a three-way crosses. The proposed strategies were supported by the analysis that showed some of these characters can result in the improvement of desirable economic characters. The improvement of *dura* population was proposed based on results that showed low male effect in females parents in most of the economic characters indicated there was higher genetic control in female parents for most of the traits. The strategies can be more viable and the improvement can be made faster by combining characters based on the heritabilities and correlation results from the studies. Results obtained in all experiments showed that different selection and breeding objectives can accumulate different set of characters and intercrossing among these *duras* can be carried out towards further yield improvement in oil palm.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk Ijazah Sarjana Sains

**VARIASI FENOTIP DAN GENOTIP DALAM PROGENI *TENERA*
DIHASILKAN DARI SUMBER *DURA* YANG BERLAINAN
DIKACUKKAN DENGAN *PISIFERA* AVROS**

Oleh

MOHAIMI MOHAMED

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Kajian ini dilaksanakan untuk mengenalpasti strategi biakbaka baru yang akan dijalankan ke arah peningkatan elit Deli dura berasal dari Pembiakbakaan Populasi Asal-usul yang Terhad (BPRO). Objektif bagi kajian ini (i) untuk menganggarkan varians fenotip dan genetik, dan keterwarisan (luas dan sempit) di dalam pelbagai populasi dura dikacukkan dengan AVROS pisifera, (ii) untuk menganggar pekali variasi fenotip dan genotip untuk semua ciri yang diukur, (iii) untuk menganggarkan korelasi fenotip di kalangan ciri kuantitatif, dan (iv) untuk menentukan ciri yang unik untuk setiap populasi dura yang dikacukkan dengan pisifera.

Tiga percubaan yang masing-masing mengandungi bilangan kacukan 17, 45 dan 15 progeni yang berasal dari kacukan elit Deli dura BPROs dengan

pisifera AVROS. Percubaan 1 dan Percubaan 2 menggunakan rekabentuk pengawanan Reka bentuk Carolina Utara I (NCM I) manakala Percubaan 3 menggunakan rekabentuk pengawanan dwi-induk. Semua percubaan ditanam menggunakan rekabentuk blok lengkap rawak (RCBD) dengan empat replikasi dan di tanam mengikut 8.8 meter tiga segi penjuru di tanah jenis tanah liat pantai di East Estate, Carey Island.

Oleh kerana tekanan pemilihan yang tinggi ke atas kebanyakan populasi dura semasa diperingkat awal program didapati lebih tertumpu ciri tertentu di dalam pelbagai populasi dura. Adalah mungkin untuk menggabungkan dua ciri yang berbeza dari dua populasi dura dan kombinasi lebih dari dua ciri yang baik melalui penggunaan kacukan tiga hala. Strategi yang dicadangkan disokong oleh analisis yang menunjukkan ciri-ciri tersebut dapat memajukan ciri ekonomi yang dikehendaki. Di dalam memajukan populasi dura, berdasarkan keputusan kajian ini, induk jantan mempunyai kesan yang sangat rendah dalam kebanyakan ciri ekonomik yang dikaji, ianya menunjukkan pengaruh induk betina tinggi dalam ciri tersebut. Strategi yang boleh berjaya dan kemajuan yang lebih cepat adalah dengan menggabungkan beberapa ciri berdasarkan keputusan keterwarisan dan kajian korelasi yang dijalankan. Keputusan yang didapati dalam kesemua percubaan menunjukkan pemilihan dan objektif pembiakbakaan yang berbeza boleh menyatukan ciri yang berbeza serta kacuksilang di antara dura ini boleh dilakukan untuk penambahbaikan ciri hasil di dalam kelapa sawit.

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I certify that a Thesis Examination Committee has met on 3 May 2012 to conduct the final examination of Mohaimi bin Mohamed on his thesis entitled “Phenotypic and Genotypic Variation in *Tenera* Progenies Derived from Different Sources of *Dura* Crossed with *Avros Pisifera*” in accordance with the Universities and University College Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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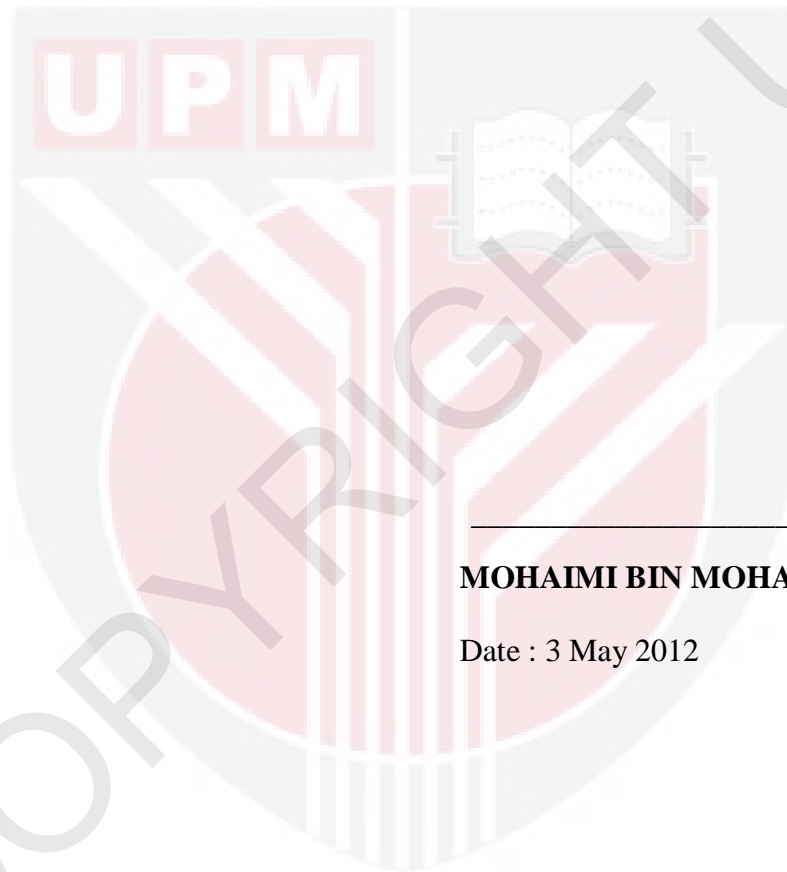
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DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently submitted for any other degree at Universiti Putra Malaysia or other institutions.



MOHAIMI BIN MOHAMED

Date : 3 May 2012

TABLE OF CONTENTS

ABSTRACT	Page
ABSTRAK	i
ACKNOWLEDGEMENTS	iii
APPROVAL	v
DECLARATION	vi
LIST OF TABLES	viii
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xviii
	xix

CHAPTER

1	INTRODUCTION	1
2	LITERATURE REVIEW	4
	2.1 Introduction of oil palm and early selection	4
	2.2 Deli <i>dura</i> in Malaysia	6
	2.3 The early oil palm breeding and selection	7
	2.4 Progress in breeding and selection	8
	2.4.1 Breeding programmes at Chemara, Layang-Layang	11
	2.4.2 Breeding programmes at OPRS, Banting	12
	2.4.3 Deli <i>dura</i> breeding programmes in United Plantations Berhad (UPB)	13
	2.4.4 Oil Palm Genetic Laboratory (OPGL) Deli <i>dura</i> breeding programmes	13
	2.4.5 Highland Research Unit (HRU) Deli <i>dura</i> breeding programmes	14
	2.4.6 Johor Labis (SOCFIN) Deli <i>dura</i> breeding programmes	14
	2.5 Breeding and selection in AVROS <i>pisifera</i> population	15
	2.5.1 Early <i>Pisifera</i> breeding in Malaysia	15
	2.5.2 The AVROS <i>pisifera</i> breeding programmes	15
	2.6 Genetic and heritability	18
	2.7 Variation in the oil palm	19
	2.8 Additive and dominance variances and heritability of traits in oil palm	21
	2.9 Heritability estimates	22
	2.9.1 Heritability estimates with different mating systems	23
	2.10 Correlations	24
3	MATERIALS AND METHODS	25
	3.1 Plant materials	25
	3.1.1 Experiment 1: Comparison between Deli and interspecific <i>duras</i> in full-sib <i>tenera</i> progenies	26
	3.1.2 Experiment 2: Performance of full-sib <i>tenera</i> progenies derived from various sources of Deli <i>dura</i>	26
	3.1.3 Experiment 3: Performance of full-sib <i>tenera</i> progenies derived from various sources of Deli <i>dura</i>	26

3.2	Methodology	26
3.2.1	Field maintenance	27
3.2.2	Data collection	27
3.2.2.1	Fresh Fruit Bunch (FFB) yield and yield components	33
3.2.2.2	Bunch analysis	34
3.2.3	Measurements of vegetative and physiological traits	36
3.2.3.1	Vegetative measurement	36
3.2.3.2	FronD production (FP) (no/p/yr)	36
3.2.3.3	Palm height (HT) (m) and height increment (HTI) (cm/yr)	37
3.2.3.4	Rachis length (RL) (cm)	37
3.2.3.5	Leaflet number (LN)	37
3.2.3.6	Leaf area index (LAI)	38
3.2.4	Statistical analyses	38
3.2.4.1	Analyses of variance (ANOVA)	38
3.2.5	Statistical and genetical analyses	40
3.2.5.1	Analysis of variance	40
3.2.5.1.1	Analysis on female sources	40
3.2.5.1.2	Analysis on full-sib families	41
3.2.5.1.3	North Carolina Model 1 (NCM1) analysis	43
3.2.6	Phenotypic correlation studies	47
3.2.7	Phenotypic (PCV) and genotypic (GCV) coefficients of variation	48
4	RESULTS	49
4.1	Experiment 1: Comparison between Deli and interspecific <i>duras</i> in full-sib <i>tenera</i> progenies	49
4.1.1	Analysis of variance and progeny means of full-sib families.	49
4.1.1.1	Yield and yield components	49
4.1.1.2	Bunch components analysis	50
4.1.1.3	Oil quality analysis	55
4.1.1.4	Vegetative measurements	58
4.1.2	Phenotypic and genetic coefficients of variation and heritability estimates for full-sib families in Experiment 1.	62
4.1.2.1	Yield and yield components	62
4.1.2.2	Bunch component analysis	63
4.1.2.3	Oil quality analysis	64
4.1.2.4	Vegetative measurements	65
4.1.3	Performance of half-sib families	66
4.1.3.1	Analysis of variance and progeny means of half-sib families.	66
4.1.3.1.1	Yield and yield components	66
4.1.3.1.2	Bunch component analysis	70
4.1.3.1.3	Oil quality analysis	76
4.1.3.1.4	Vegetative measurements	79
4.1.4	Performance of DXP progenies based on female sources in Experiment 1.	84

4.1.4.1 Progeny means of female sources	84
4.1.4.1.1 Yield and yield components	84
4.1.4.1.2 Bunch components analysis	86
4.1.4.1.3 Oil quality analysis	88
4.1.4.1.4 Vegetative measurements	89
4.2 Experiment 2: Performance of full-sib <i>tenera</i> progenies derived from various sources of <i>Deli dura</i>	94
4.2.1 Analysis of variance	94
4.2.1.1 Yield and yield components	94
4.2.1.2 Bunch component analysis	95
4.2.1.3 Oil quality	96
4.2.1.4 Vegetative measurements	97
4.2.2 Phenotypic and genetic coefficients of variation and heritability estimates for full-sib families in experiment2	97
4.2.2.1 Yield and yield components	97
4.2.2.2 Bunch components analysis	98
4.2.2.3 Oil quality	104
4.2.2.4 Vegetative measurement	107
4.2.3 Analysis of variance and progeny means of half-sib families	108
4.2.3.1 Yield and yield components	108
4.2.3.2 Bunch components analysis	116
4.2.4 Phenotypic and genetic coefficients of variation and heritability estimates for half-sib families in Experiment 2.	117
4.2.4.1 Yield and yield components	117
4.2.4.2 Bunch components analysis	118
4.2.4.3 Oil quality analysis	119
4.2.4.4 Vegetative measurements	120
4.2.5.1 Oil quality analysis	119
4.2.5.2 Vegetative measurements	129
4.2.6 Performance of DXP progenies based on female sources in Experiment 2	136
4.2.6.1 Progeny means of female sources	136
4.2.6.1.1 Yield and yield components	136
4.2.6.1.2 Bunch components analysis	137
4.2.6.1.3 Oil quality analysis	139
4.2.6.1.4 Vegetative measurements	143
4.3 Experiment 3: Performance of full-sib <i>tenera</i> progenies derived from various sources of <i>Deli dura</i>	145
4.3.1 Full-sib families	145
4.3.1.1 Analysis of variance and progeny means of full-sib families	145
4.3.1.1.1 Yield and yield components	146
4.3.1.1.2 Bunch components analysis	148
4.3.1.1.3 Vegetative measurements	151
4.3.2 Phenotypic and genetic coefficients of variation and heritability estimates for full-sib families in Experiment 3	155
4.3.2.1 Yield and yield components	155
4.3.2.2 Bunch component analysis	156
4.3.2.3 Oil quality analysis	157

4.3.2.4	Vegetative measurements	158
4.3.3	Heritability	158
4.3.3.1	Yield and yield components	158
4.3.3.2	Bunch Component Analysis	161
4.3.3.3	Oil quality analysis	164
4.3.3.4	Vegetative measurements	165
4.3.4	Performance of DXP progenies based on female sources in Experiment 3	169
4.3.4.1	Progeny means of female sources	169
4.3.4.1.1	Yield and yield components	169
4.3.4.1.2	Bunch component analysis	170
4.3.4.1.3	Oil quality analysis	173
4.3.4.1.4	Vegetative measurement	174
4.4	Correlation studies	177
4.4.1	Phenotypic correlations between oil yield and its components for all the populations	177
5	DISCUSSION	186
5.1	Variability and inheritance of characters in the DXP populations	186
5.1.1	Yield and yield components	187
5.1.2	Bunch components analysis	189
5.1.3	Oil quality analysis	191
5.1.4	Vegetative measurements	191
5.2	Association and contribution of the economic component characters of oil yield	193
6	CONCLUSION	195
	REFERENCES	198
	BIODATA OF STUDENT	205