TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
ABSTRACT (IN ENGLISH)	v
ABSTRACT (IN THAI)	vii
LIST OF TABLES	xiii
LIST OF FIGURES	xv
ABBREVIATIONS	xvii
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 LITERATURE REVIEW	. 3
1. Techniques used in the identification of species complex	tes 3
1.1. Morphological variation	4
1.2 Biochemical divergence	6
1.3 Hybridization or Crossing experiment	7
1.4 Polytene chromosomes	9
1.5 Mitotic and meiotic karyotypes	12
1.6 Molecular approaches	15

TABLE OF CONTENTS (cont.)

			Page
2 Other techniques	used for identifies	tion of species complexe	es 17
2. Other techniques	used for identifica	tion of species complexe	;s 1 <i>1</i>
2.1 Biologica	al distinction		17
2.2 Cuticular	hydrocarbon profile		17
CHAPTER 3 MATERIAL	S AND METHOD	S	21
1. Materials			21
1.1 Collection	n of magnitors		21
1,1 Collection	n of mosquitoes		21
1.1.1	Anopheles minimus	species C	21
1.1.2	Anopheles minimus	species E (ISG strain) col	lony 22
1.2 Chemical	s and reagents		22
1.2.1	For polytene chromo	osome study	22
2. Methods			23
2.1 Rearing n	nethod of mosquitoe	es	23
2.1.1	Rearing method of A	Anopheles minimus specie	es C 23
2.1.2	Rearing method of A	Anopheles minimus specie	es E 25
2.2 Biologica	al study of <i>Anophele</i> s	s minimus species E and (25
2.2.1	Observation on life	duration	25
2.2.2	Ability of free matir	ng in a 30x30x30 cm cage	26

TABLE OF CONTENTS (cont.)

	Page
2.3 Hybridization study	27
2.4 Polytene chromosomes study	28
2.5 Statistical analysis	29
CHAPTER 4 RESULTS	30
1. Biological study	30
1.1 Observations on life duration	30
1.2 Ability of free mating in a 30-cm cage	30
2. Hybridization study	37
3. Study of polytene chromosomes	51
CHAPTER 5 DISCUSSION	54
REFERENCES	58
APPENDIX	65
CURRICULUM VITAE	68

LIST OF TABLES

Table		Page
1.	Alignment of all available D3 rDNA sequences of Anopheles	
	minimus, An. flavirostris, and An. aconitus	. 19
2.	Duration of 100 eggs of An. minimus species C and species E	
	developing to hatching first instar larvae in laboratory	31
3.	Duration of 100 larvae of An. minimus species C and species	
	E developing to pupae in laboratory	32
4.	Duration of 100 pupae of An. minimus species C and species	
	E developing to emerging adults in laboratory	33
5.	Longevity of 100 adult females of An. minimus species C	
	and species E in laboratory rearing with 5% sugar solution	34
6.	Longevity of 100 adult males of An. minimus species C and	
	species E in laboratory rearing with 5% sugar solution	35
7.	Insemination rates of An. minimus species C and species E	
	after free mating in a 30-cm cage	36
8.	Results from interstrain cross between An. minimus species E	
	and species C	40
9.	Results from fertility tests of backcrosses between the	,
	hybrids and the parental strains and of the hybrids	41

LIST OF TABLES (cont.)

Table

10. Abnormality of male progeny from backcrosses

42

LIST OF FIGURES

Figur	·e	Page
1.	Diagrammatic representation and comparison of metaphase	
	karyotypes of Anopheles minimus species A and C	13
2.	Diagrammatic representation and comparison of Giemsa-	
	stained metaphase karyotypes of CM (species A) and ISG	
	(species E) strains of Anopheles minimus	14
3.	A neighbor-joining tree of the D3 region of rDNA for all	
	available Anopheles minimus sequences using An. aconitus	
	and An. flavirostris as the outgroup	20
4.	Internal sex organs of F ₁ hybrid males from species C female	
	x species E male	43
5.0	Internal sex organs of F ₁ hybrid males from species E female	
	x species C male	44
6.	Internal sex organs of F ₂ hybrid males from (E female x C	
	male) F ₁ hybrid	45
7.	Internal sex organs of male progeny obtained from	
	backcrosses of both (C x E) x E and (E x C) x E	46
8.	Internal sex organs of male progeny obtained from	
	backcrosses of both (C x E) x E and (E x C) x E	47

LIST OF FIGURES (cont.)

Figu	re	Page
9.	Internal sex organs of male progeny obtained from	
	backcrosses of both (C x E) x E and (E x C) x E	48
10.	Internal sex organs of male progeny obtained from	·
	backcrosses of both (C x E) x C and (E x C) x C	49
11.	Internal sex organs of male progeny obtained from	
	backcrosses of both (C x E) x C and (E x C) x C	50
12.	The salivary gland polytene chromosome of F ₁ hybrid larvae	
	from species E female x species C male	. 52
13.	The salivary gland polytene chromosome of F ₁ hybrid larvae	
	from species C female x species E male	53

ABBREVIATIONS

⁰C degree Celsius

% percentage

< less than

more than

cm centimeter

e.g. exempli gratia

g gram

h hour

L:D light : dark

mg milligram

ml _ milliliter

No. number