TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
LIST OF TABLES	x
LIST OF ILLUSTRATIONS	xiii
ABBREVIATIONS	xiv
I. INTRODUCTION	1
II. LITERATURE REVIEWS	3
STR and DNA fingerprinting	3
STR allele determination	5
Characteristic of studied STR	6
Forensic terms and how to calculate	9
Hardy-Weinberg equilibrium	14
Assumption of Hardy-Weinberg equilibrium	15
Proof of the Hardy-Weinberg equilibrium	19
III. MATERIALS AND METHODS	25
Populations	25
Sample preparation	25
DNA extraction	26
Determination of DNA	27
Multiplex PCR	27

Detection of amplification products	28
Preparation of denaturing polyacrylamide gel	29
DNA fingerprinting determination	31
Collection and analysis of data	35
IV. RESULTS	36
The example of DNA fingerprinting	36
Observed genotype in each locus	38
Observed alleles and expected genotypes in each locus	43
Chi-square test between observed and expected genotypes	50
Power of Discrimination in each locus	56
Summary of P.D.	63
Summary of P.E.	65
Summary of allelic frequencies in 6 loci	66
V. DISCUSSION	67
VI. SUMMARY	71
VII. REFERENCES	72
VIII. APPENDIX	78
IX. CURRICULUM VITAE	82

LIST OF TABLES

IA.	BLE	PAGI
1.	Genotypes observed from amplification of DNA in	38
	CSF1PO locus, by using the CTT Triplex set and silver	
	staining system	
2.	Genotypes observed from amplification of DNA in	39
	TPOX locus, by using the CTT Triplex set and silver	
	staining system	
3.	Genotypes observed from amplification of DNA in	40
	THO1 locus, by using the CTT Triplex set and silver	
	staining system	
4.	Genotypes observed from amplification of DNA in	41
	F13AO1 locus, by using the FFv Triplex set and silver	
	staining system	
5.	Genotypes observed from amplification of DNA in	42
	FESFPS locus, by using the FFv Triplex set and silver	
	staining system	
6.	Genotypes observed from amplification of DNA in	43
	vWA locus, by using the FFv Triplex set and silver	
	staining system	
7.	Observed alleles and expected genotypes in the	45
	CSF1PO locus	
8.	Observed alleles and expected genotypes in the	46
	TPOX locus	

TABLE	PAGE
9. Observed alleles and expected genotypes in the THO1	47
locus	
10. Observed alleles and expected genotypes in the F13AO1	48
locus	
11. Observed alleles and expected genotypes in the FESFPS	49
locus	
12. Observed alleles and expected genotypes in the vWA locus	50
13. Chi-square test between observed and expected	51
genotypes in the CSF1PO locus	
14. Chi-square test between observed and expected	52 -
genotypes in the TPOX locus	
15. Chi-square test between observed and expected	53
genotypes in the THO1 locus	35
16. Chi-square test between observed and expected	54
	34
genotypes in the F13AO1 locus	
17. Chi-square test between observed and expected	55
genotypes in the FESFPS locus	
18. Chi-square test between observed and expected	5 6
genotypes in the vWA locus	
19. Power of discrimination from expected genotypes	57
in the CSF1PO locus	
20. Power of discrimination from expected genotypes	58
in the TPOX locus	

TABLE	PAGE
21. Power of discrimination from expected genotypes	59
in the THO1 locus	
22. Power of discrimination from expected genotypes	60
in the F13AO1 locus	
23. Power of discrimination from expected genotypes	61
in the FESFPS locus	
24. Power of discrimination from expected genotypes	62
in the vWA locus	
25. Summary of power of discrimination (P.D.) and combined	63
P.D. from CTT and FFv Triplex	
26. Summary of power of exclusion (P.E.) and combined	65
P.E. from CTT and FFv Triplex	
27. Summary of allelic frequencies in 6 loci from CTT and FFv Triplex	66

LIST OF ILLUSTRATIONS

FIG	FURE	PAGE
1.	DNA fingerprinting of 6 individuals 1-6 (lane 2-4,6-8),	36
	using CSF1PO,TPOX,THO1 loci.	
2.	DNA fingerprinting of 6 individuals 1-6 (lane 2-4,6-8),	37
	using F13AO1, FESFPS, vWA loci.	

ABBREVIATIONS

APC automatic processor compatible (film)

°C degree of Celsius

DNA deoxyribonucleic acid

Kb kilobases

mg milligram

ml millilitre

μg microgram

μl microlitre

PCR polymerase chain reaction

P.D. power of discrimination

P.E. power of exclusion

rpm rounds per minute

STR short tandem repeat

VNTR variable number of tandem repeat

 χ^2 Chi-square

df degree of freedom

\(\summation \)

P probability (value)