CONTENTS

	Page
Contents	viii
List of Tables	
List of Figures	х
List of Abbreviations and Symbols	xii
Chapter	
1. Introduction	1
Introduction	1
Objective	3
2. Review of Literature	4
3. Materials and Methods	23
1. Materials	23
2. Methods	26
4. Results	41
5. Discussion	74
6. Conclusions	82
Bibliography	84
Appendix	
Vitae	

LIST OF TABLES

Table	9	Page
1	Different structural classes of $lpha$ -amylase inhibitor	5
2	Amount of Parkia speciosa powder extracted by 5 different	
	methods for 50% inhibition of $lpha$ -amylase activity	43
3	Stability of $ lpha$ -amylase inhibitor in the crude extracts after	
	three months storage at -20°C	44
4	Inhibitory activity of precipitate at different percentage of	
	ammonium sulfate saturation	47
5	Inhibitory activity of precipitate and supernatant at each	
	percentage of ethanol precipitation	48
6	Inhibitory activity of precipitate and supernatant at each	
	percentage of methanol precipitation	49
7	Summary of purification of the $lpha$ -amylase inhibitor from fresh	
	green pericarp of sataw	54
8	Potential application of $lpha$ - inhibitor on blood glucose reduction	
	<i>via</i> luminal enzymes	60

LIST OF FIGURES

Figu	re	Page	
1	Molecular structure of acarbose		
2	Molecular structure of Hibiscus acid : Hibiscus acid (R=H);		
	Hibiscus acid 6-methyl ester (R=CH ₃)	7	
3	Basic structure of tannin	8	
4	General structure and numbering pattern for common flavonoids	9	
5	Molecular structure of glucopyranosylidene-spiro-thiohydantoin		
	(G-TH)	10	
6	Common structure of phenol	10	
7	Molecular structure of Stigmast-4-en-3-one	11	
8.	Parkia spesiosa Hassk. (Sataw)	20	
9	Variety of sataw	21	
10	Sephadex G-75 column chromatography of crude extract.	52	
11	Sephadex G-75 column chromatography of Aq 95% MeOH	52	
12	Sephadex G-75 column chromatography of redissolved		
	precipitate solution	53	
13	Thin layer chromatography (TLC) of crude extract and		
	Sephadex G-75 fraction	53	
14	Effect of temperature on inhibitory activity of the inhibitor	57	
15	Stability of the inhibitor in various temperatures	57	
16	Effect of pH on inhibitory activity of the inhibitor	58	
17	Stability of the inhibitor in various pH	58	
18	Effect of salt on inhibitory activity of the inhibitor	59	
19	Lineweaver- Burk plot (1/[s] vs 1/v) for humam salivary $lpha$ -amylase	62	
20	Lineweaver- Burk plot (1/[s] vs 1/v) for yeast sucrase	63	
21	Lineweaver- Burk plot (1/[s] vs 1/v) for yeast maltase	64	

LIST OF FIGURES (continued)

Figure		
22	Activity of insect amylases after the addition of crude extract	67
23	Activity of insect after the addition of Sephadex G-75 fraction	67
24	Effect of inhibitor on the growth of insect pest in artificial beans	68
25	Effect of inhibitor on the growth of insect pest in mungbean	69
26	Infrared spectra of Sephadex G-75 fraction, its acid hydrolysate	71
27	Identification of Sephadex G-75 fraction with thin layer	
	chromatography (TLC)	72

LIST OF ABBREVIATIONS AND SYMBOLS

AI	=	Amylase inhibitor
°C	=	Degree Celsius
cm	=	Centimeter
g	=	Gram
h	=	Hour
HCI	=	Hydrochloric acid
H ₂ O	=	Distilled water
kDa	=	Kilodalton
kg	=	Kilogram
ki	=	Enzyme inhibition constant
Ι	=	Liter
mg	=	Milligram
min	=	Minute
ml	=	Milliliter
Μ	=	Molar
Mb	=	Millibar
mM	=	Millimolar
NaCl	=	Sodium chloride
NaOH	=	Sodium hydroxide
nM	=	Nanomolar
nm		Nanometer
μΜ	=	Micromolar
NMR	=	Nuclear magnetic resonance
OD.	=	Optical density
рН	=	-Log hydrogen ion concentration
PVP	=	Polyvinyl pyroridone
PMSF	=	Phenylmethylsulphonylfluoride

LIST OF ABBREVIATIONS AND SYMBOLS (continued)

R _f	=	Retention factor
rpm	=	Revolution per minute
U	=	Unit
v/v	=	Volume per volume
w/v	=	Weight per volume
%	=	Percent