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ABSTRACT

This study was done to determine the inhibitory activity that were exhibited by different parts of the local plants in Malaysia selected from the 4 families which are Leguminosae, Rubiaceae, Apocynaceae and Euphorbiaceae. The screening method used in this study are Bradford Assay and Trypsin Inhibitory Assay. Both these assays revealed that *Senna surattensis* leaves showed the highest inhibitory activity of 83 % compared to other 41 plant samples studied in this study. SDS-PAGE and Tricine SDS on this sample extract showed the presence of this protease inhibitor through the formation of band. From these band also, the molecular weight for *Senna surattensis* leaves was determined to be 27.93 kDa. From the mode of inhibition study carried on *Senna surattensis* leaves, it was found out that this plant belongs to the competetive inhibitor group with K_i value of 8.89 $x10^{-5}$ mM. Thermostability test reavealed that *Senna surattensis* leaves extract can only work best at temperature below 60˚C and achieve its optimum inhibitory temperature at 45°C with 87.35 % of inhibitory activity. *Senna surattensis* leaves extract also showed the ability to inhibit the protein extracted from *Chrysomya megacephala* through the study performed on the crude *Chrysomya megacephala* protein extract. The IC_{50} value of *Senna surattensis* leaves extract was determined to be 0.0174 μg/μl. Although with all of these promising result, further test need to be done to confirm it.

ABSTRAK

Kajian ini dijalankan untuk menentukan aktiviti-aktiviti perencatan yang ditunjukkan oleh beberapa jenis bahagian tumbuh-tumbuhan tempatan di Malaysia yang terdiri daripada 4 famili iaitu Leguminosae, Rubiaceae, Apocynaceae and Euphorbiaceae. Kaedah penyaringan ujian Bradford dan ujian perencatan tripsin menunjukkan bahawa daun *Senna surattensis* mempunyai kebolehan perencatan yang paling tinggi berbanding 41 sampel tmbuh-tumbuhan yang lain di dalam kajian ini iaitu sebanyak 83 %. Ujian SDS-PAGE dan Ujian Tricine SDS terhadap sampel ini menunjukkan kehadiran protin perencat melalui jalur yang terhasil. Melalui jalur ini juga, berat molekular bagi daun *Senna surattensis* dianggarkan sebanyak 27.93 kDa. Daripada penentuan Mod perencatan ke atas ekstrak daun *Senna surattensis*, didapati ianya tergolong dalam kumpulan perencatan kompetetif dengan nilai K_i sebanyak of 8.89 $x10^{-5}$ mM. Ujian kestabilan suhu yang dijalankan menunjukkan bahawa ekstrak daun *Senna surattensis* hanya mampu berfungsi di bawah suhu 60˚C dan mencapai suhu perencatan optimum pada 45°C dengan 87.35 % aktiviti perencatan. Ekstrak daun *Senna surattensis* juga mampu merencat protein yang diekstrak daripada *Chrysomya megacephala* melalui ujian yang dijalankan ke atas ekstrak protin mentah *Chrysomya megacephala*. Nilai IC_{50} yang diperolehi untuk ekstrak daun *Senna surattensis* adalah 0.0174 μg/μl.

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LIST OF SYMBOLS AND ABBREVIATIONS:

BapNA	*N*-alpha-benzoyl-dl-arg-*p*-nitroanilide
BBI	Bowman-Birk inhibitor
BSA	Bovine Serum Albumin
Bt	*Bacillus thuringiensis*
BTI	Barley trypsin inhibitor
cm	centimetre
CpTi	Cowpea trypsin inhibitor
DMSO	Dimethy Sulfoxide
DPPH	1,1-Diphenyl-2-picrylhydrazyl
g	Gram
HCl	Hydrochloric Acid
HMW	High Molecular Weight
KDa	Kilo Dalton
Ki	Inhibition constant
LMW	Low Molecular Weight
M	Molar
mA	mili Ampere
MAP	Mitogen-Activated protein
MCF7	Michigan Cancer Foundation-7
mg	miligram
ml	Mililiter
NaOH	Sodium Hydroxide
nm	nanometer
PIs	Protease inhibitors

PVY	Potato Virus Y
rpm/min	Revolution per minute
SDS	Sodium dodecyl Sulfate
SDS PAGE	Sodium dodecyl Sulfate-Polyacrylamide Gel Electrophoresis
SPIs	Serine Protease inhibitors
TEMED	N,N,N'N' –tetramethylenediamine
TEV	Tobacco Etch Virus
TPCK	L-1-tosylamido-2-phenylethyl chloromethyl ketone
UV	ultra violet
v/v	volume per volume
w/v	weight per volume
xg	Gravity
α	Alpha
β	Beta
γ	Gamma
°C	Degree Celcius
%	Percent