

ผลกึ่งเฉียบพลันของสารสกัดหนูปักกิ่งด้วย.ethanol ต่อเนื้อไขมันโคโรน พี450 ในตับ และ
ค่าเคมีคลินิกในเลือดของหนูขาว

นางสาวอัจฉรา ฉัตรสุภางค์

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SUBACUTE EFFECTS OF *MURDANNIA LORIFORMIS* ETHANOLIC EXTRACT ON
HEPATIC CYTOCHROME P450 AND CLINICAL BLOOD CHEMISTRY IN RATS

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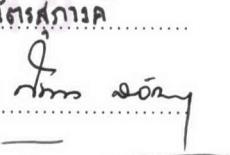
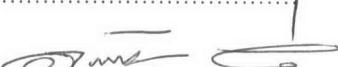
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หญ้าปักกิ่ง มีชื่อทางพฤกษศาสตร์ว่า *Murdannia loriformis* (Hassk.) Rolla Rao et Kamathy เป็นสมุนไพรพื้นบ้านที่นิยมใช้เพื่อรักษาและบรรเทาอาการจากโรคมะเร็งหล่ายชนิด การศึกษานี้มุ่งศึกษาผลกึ่งเฉียบพลันของสารสกัดหญ้าปักกิ่งด้วยethanol extract ต่อการทำงานของเอนไซม์ในเฟสหนึ่ง คือเอนไซม์ไซโตクロมพี 450 (cytochrome P450, CYP) นอกจากนี้ยังได้ศึกษาผลของสารสกัดนี้ต่อค่าเคมีคลินิกและโลหิตวิทยาในเลือดของหนูขาวด้วย การทดลองใช้หนูขาวเพศผู้พันธุ์สตาร์จำนวน 30 ตัว โดยแบ่งหนูขาวแบบสุ่มเป็น 3 กลุ่ม กลุ่มละ 10 ตัว กลุ่มแรกเป็นกลุ่มควบคุมได้รับน้ำกัลล์ ขนาด 1 มิลลิลิตร/กิโลกรัม/วัน กลุ่มที่สองและสามเป็นกลุ่มที่ได้รับสารสกัดหญ้าปักกิ่งด้วยethanol ในขนาด 0.1 และ 1 กรัม/กิโลกรัม/วัน ตามลำดับ หนูแต่ละกลุ่มจะได้รับการป้อนเป็นเวลา 30 วัน ระหว่างทำการทดลอง บันทึกน้ำหนักตัวทุก 7 วัน เมื่อครบระยะเวลา ทำให้น้ำหนักลดลงรู้สึก เก็บตัวอย่างเลือดจากหัวใจเพื่อตรวจค่าโลหิตวิทยา และแยกซีรัมเพื่อตรวจค่าเคมีคลินิก นำตัวมาตรวจในโครโนม เพื่อใช้ตรวจวิเคราะห์ความเข้มข้นของ total CYP, สมรรถนะของ CYP 1A1, 1A2, 2B1/2, 2E1 และ 3A ผลการทดลองพบว่าสารสกัดหญ้าปักกิ่งด้วยethanol ทั้งสองขนาด ไม่มีผลต่อน้ำหนักตัว น้ำหนักสัมพัทธ์ ของตับ อีกทั้งไม่มีผลต่อความเข้มข้นของ total CYP, สมรรถนะของ CYP 1A1, 1A2, 2B1/2, 2E1 และ 3A สารสกัดหญ้าปักกิ่งด้วยethanol ทั้งสองขนาดไม่มีผลต่อค่าเคมีคลินิกและโลหิตวิทยา ต่าง ๆ ต่อไปนี้คือ AST, ALT, ALP, total bilirubin, direct bilirubin, BUN, SCr, total cholesterol, TG, LDL-C, HDL-C, glucose, sodium, potassium, chloride, hemoglobin, hematocrit, platelet count, WBC count, % differential WBCs, RBC indices (mean corpuscular volume, MCV; mean corpuscular hemoglobin, MCH; mean corpuscular hemoglobin concentration, MCHC) และ RBC morphology จากผลการทดลองนี้แสดงให้เห็นว่าสารสกัดหญ้าปักกิ่งด้วยethanol ไม่มีผลเปลี่ยนแปลงสมรรถนะของเอนไซม์ส่วนใหญ่ในเฟสหนึ่งที่มีบทบาทสำคัญในกระบวนการต้านฤทธิ์ของสารก่อมะเร็ง/สารก่อการกลายพันธุ์ นอกจากนี้สารสกัดหญ้าปักกิ่งด้วยethanol ยังไม่มีผลต่อการทำงานของอวัยวะหรือระบบของร่างกายที่สำคัญ เช่น ตับ ไต ระบบเลือด อิเล็กโทรไลต์ รวมทั้ง เมแทบอลิซึมของไขมันและคาร์บอโนไดเรต

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Murdannia loriformis (Hassk). Rolla Rao et Kammathy is commonly called in Thai as "Ya Pak King". *M. loriformis* has been used traditionally as a remedy for many kinds of cancers. This study examined subacute effects of *M. loriformis* ethanolic extract on phase I hepatic cytochrome P450 (CYP) in rats. In addition, effects of this extract on clinical blood chemistry and hematology were also determined. Thirty male Wistar rats were randomly divided into three treatment groups, ten in each group. Rats in the first group were given distilled water 1 ml/kg/day serving as a control group. The other two groups of rats were given *M. loriformis* ethanolic extract at dosages of 0.1 and 1 g/kg/day. Each group were administered orally for 30 consecutive days. During the treatment period, body weight was recorded every week. At the end of the treatment period, rats were anesthetized. Blood samples were collected by heart puncture and serum samples were prepared for measuring hematology and clinical blood chemistry, respectively. Microsomes were prepared from livers and being used for determining concentrations of total CYP as well as activities of CYP 1A1, 1A2, 2B1/2, 2E1 and 3A. The results showed that *M. loriformis* ethanolic extract at both dosages given in this study did not affect body weight, relative liver weight, hepatic total CYP concentrations and the activities of CYP 1A1, 1A2, 2B1/2, 2E1 and 3A. Rats received both dosage regimens of *M. loriformis* ethanolic extract demonstrated no changes of the following clinical blood chemistry and hematology: AST, ALT, ALP, total bilirubin, direct bilirubin, BUN, SCr, total cholesterol, TG, LDL-C, HDL-C, glucose, sodium, potassium, chloride, hemoglobin, hematocrit, platelet count, WBC count, % differential WBCs, RBC indices (MCV, MCH, MCHC), and RBC morphology. These results suggested that *M. loriformis* ethanolic extract did not modulate the activities of the most phase I hepatic CYPs involving in carcinogenic/mutagenic bioactivation. Furthermore, no effects of this extract were shown on several important organs/systems such as liver, kidney, blood system, electrolytes as well as carbohydrate and lipid metabolism.

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LIST OF ABBREVIATIONS

AFB ₁	= alfatoxin B ₁
ALP	= alkaline phosphatase
ALT	= alanine aminotransferase
ANOVA	= a one way analysis of variance
AST	= aspartate aminotransferase
B(a)P	= benzo(a)pyrene
BR	= benzyloxyresorufin
BROD	= benzyloxyresorufin O-dealkylase
BSA	= bovine serum albumin
BUN	= blood urea nitrogen
BW	= body weight
CD	= cluster of differentiation
cm	= centimeter
CYP	= cytochrome P450
dL	= deciliter
DMSO	= dimethyl sulfoxide
DNA	= deoxyribonucleic acid
ED ₅₀	= median effective dose
e.g.	= exempli gratia
ER	= ethoxresorufin
EROD	= ethoxresorufin O-dealkylase
et al.	= et alii (and other)
fL	= femtoliter
g	= gram
G6P	= glucose 6-phosphate
G6PD	= glucose 6-phosphate dehydrogenase
GST	= glutathione S-transferase
Hb	= hemoglobin
Hct	= hematocrit

LIST OF ABBREVIATIONS (*continued*)

HDL-C	= high density lipoprotein cholesterol
i.p.	= intraperitoneal
kg	= kilogram
L	= liter
LD ₅₀	= median lethal dose
LDL-C	= low density lipoprotein cholesterol
M	= molar (mole per liter)
MCH	= mean corpuscular hemoglobin
MCHC	= mean corpuscular hemoglobin concentration
MCV	= mean corpuscular volume
mEq	= miliequivalent
min	= minute
mg	= milligram
ml	= milliliter
mm	= millimeter
mM	= millimolar (millimole per liter)
mmol	= millimole
MR	= methoxyresorufin
mRNA	= messenger ribonucleic acid
MROD	= methoxyresorufin O-dealkylase
MW	= molecular weight
NADP	= nicotinamide adenine dinucleotide phosphate
NADPH	= nicotinamide adenine dinucleotide phosphate (reduced form)
nm	= nanometer
nM	= nanomolar (nanomole per liter)
nmol	= nanomole
PAH	= polycyclic aromatic hydrocarbon
PBMC	= peripheral blood mononuclear cell
pg	= picogram

LIST OF ABBREVIATIONS (*continued*)

pmol	= picomole
PR	= pentoxyresorufin
PROD	= pentoxyresorufin O-dealkylase
RBC	= red blood cell
r.p.m.	= revolution per minute
SCr	= serum creatinine
SEM	= standard error of mean
SER	= smooth endoplasmic reticulum
sec	= second
TCA	= trichloroacetic acid
TCDD	= 2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin
TG	= triglyceride
TLC	= thin layer chromatography
Tris	= Tris (hydroxymethyl) aminomethane
U	= unit
UDP-GT	= uridine diphosphoglucuronosyltransferase
WBC	= white blood cell
w/v	= weight by volume
v/v	= volume by volume
XRE	= xenobiotic response element
°C	= degree celsius
β	= beta
γ	= gamma
α	= alpha
μg	= microgram
μl	= microliter
μM	= micromolar (micromole per liter)