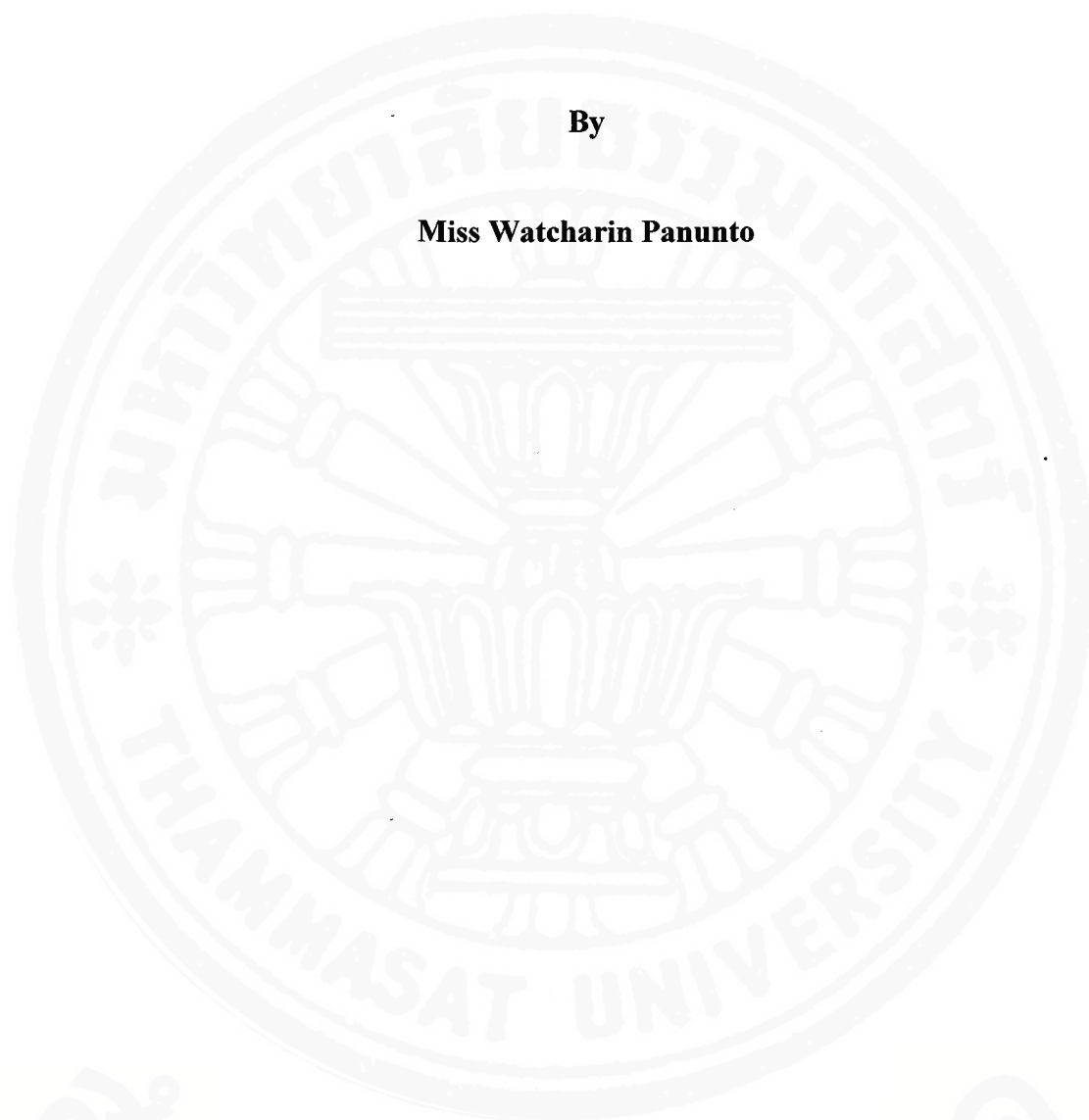


**Acute and Chronic Toxicity Studies of the Water Extracts
from Dried Fruits of *Terminalia chebula* Retz. and
Terminalia bellerica (Gaertn.) Roxb. in Rats**

By

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for the Degree of Master of Science in Medical Sciences**

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Terminalia bellerica (Gaertn.) Roxb. in Rats

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Abstract

Acute and chronic toxicities of the water extract from the dried fruits of *Terminalia chebula* Retz. and *Terminalia bellerica* (Gaertn.) Roxb. were studied in both female and male rats. For the study of acute toxicity, a single oral administration of the water extract at a dose of 5,000 mg/kg body weight (5 female, 5 male) was performed and the results showed no signs of toxicity such as general behavior changes, morbidity, mortality, changes on gross appearance or histopathological changes of the internal organs of rats. The study of chronic toxicity was determined by oral feeding both female and male rats (10 female, 10 male) daily with the test substance at the dose of 300, 600 and 1,200 mg/kg body weight continuously for 270 days. The examinations of signs of toxicity showed no abnormalities in the test groups as compared to the controls. In addition, these rats were analyzed for final body and organ weights, necropsy, as well as hematological, biochemical and histopathological parameters. Taken together, the water extract from the dried fruits of *Terminalia chebula* and *Terminalia bellerica* did not cause acute or chronic toxicities in either female or male rats.

บทคัดย่อ

ทำการศึกษาคือความเป็นพิษเฉียบพลันและพิษเรื้อรังของสารสกัดน้ำจากผลแห้งของสมอไทยและสมอพิเภกในหนูขาวทั้งเพศเมียและเพศผู้ โดยที่การศึกษาคือความเป็นพิษเฉียบพลันได้ทำการทดสอบโดยการป้อนสารสกัดครั้งเดียวในขนาด 5,000 มิลลิกรัมต่อกิโลกรัมน้ำหนักตัว (เพศเมีย 5 ตัว เพศผู้ 5 ตัว) จากผลการศึกษาไม่พบความผิดปกติใดๆที่แสดงออกถึงความเป็นพิษของสารสกัด เช่น การเปลี่ยนแปลงทางด้านพฤติกรรม การเจ็บป่วย การตาย รวมถึงไม่พบการเปลี่ยนแปลงทั้งลักษณะทางกายภาพและจุลพยาธิวิทยาของอวัยวะภายในของหนูขาว ส่วนการศึกษาคือความเป็นพิษเรื้อรังได้ทำการศึกษาโดยการป้อนสารสกัดทางปากแก่หนูขาวทั้งเพศเมียและเพศผู้ (เพศเมีย 10 ตัว เพศผู้ 10 ตัว) ทุกวันในขนาด 300, 600 และ 1,200 มิลลิกรัมต่อกิโลกรัมน้ำหนักตัว ติดต่อกันเป็นเวลา 270 วัน และทำการวิเคราะห์ผลจากการสังเกตพฤติกรรม การเจ็บป่วย การตาย การวิเคราะห์น้ำหนักตัว น้ำหนักอวัยวะภายใน นอกจากนี้ยังทำการวิเคราะห์จากค่าทางโลหิตวิทยา ค่าเคมีคลินิกของเลือดและตรวจจลลักษณะทางกายภาพและจุลพยาธิวิทยาของอวัยวะภายใน ซึ่งผลการศึกษาไม่พบความผิดปกติใดๆที่แตกต่างจากกลุ่มควบคุม จากการศึกษาครั้งนี้จึงสามารถสรุปได้ว่าสารสกัดน้ำจากผลแห้งของสมอไทยและสมอพิเภกไม่ก่อให้เกิดความเป็นพิษเฉียบพลันและพิษเรื้อรังในหนูขาวทั้งเพศเมียและเพศผู้

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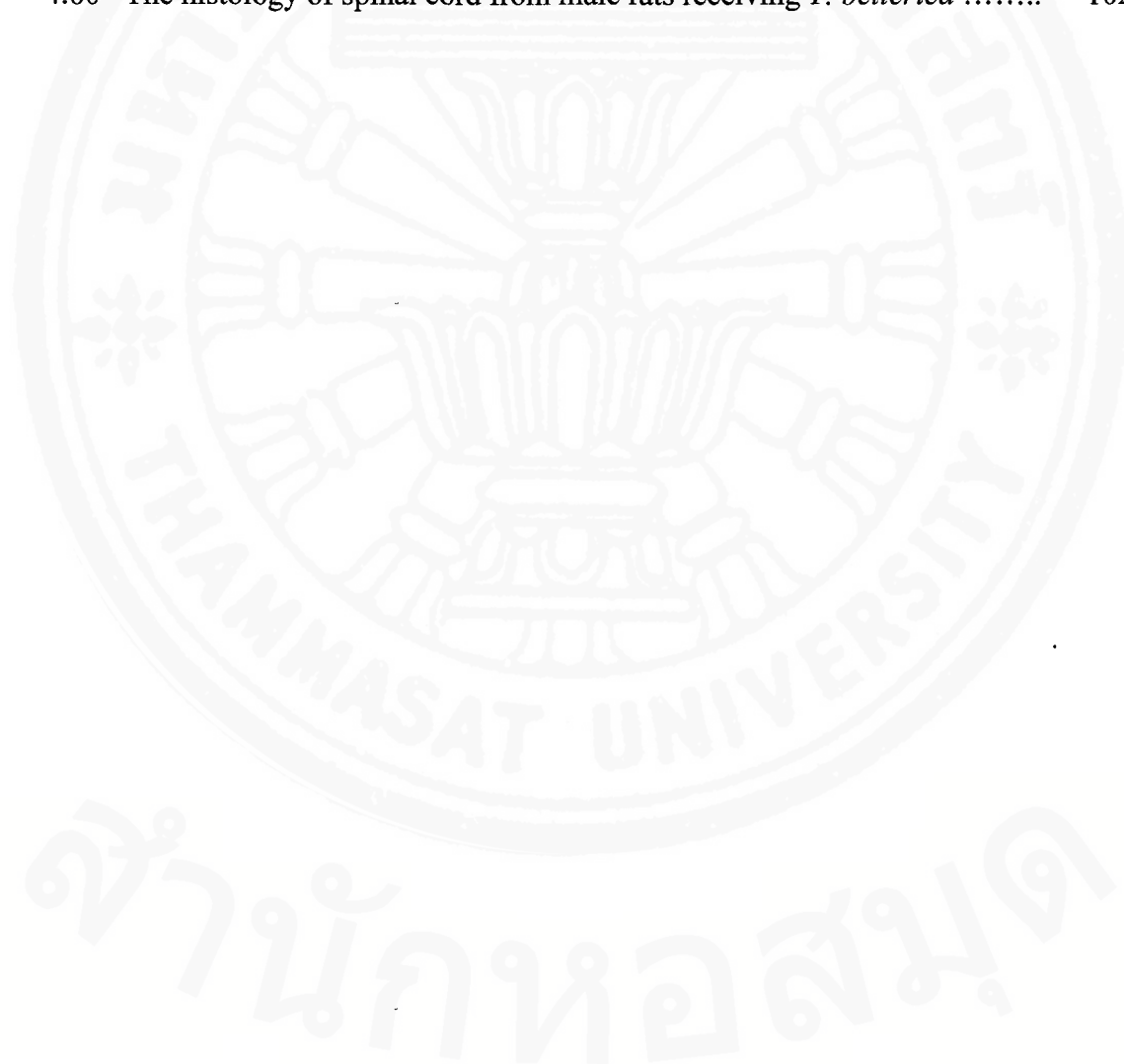
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List of Abbreviations

Abbreviation	Term
µg	microgram(s)
µl	microliter(s)
µM	micromolar
γ	gramma
ABTS	2, 2'-azobis (3-ethylbezothiazoline 6-sulphonate)
As	arsenic
AST	aspartate aminotransferase
ALT	alanine aminotransferase
ALP	alkaline phosphatase
BUN	blood urea nitrogen
BW	body weight
Cd	cadmium
cm	centimeter
CMV	cytomegalovirus
CTL	cytotoxic T lymphocyte
dl	deciliter (s)
DNA	deoxyribonucleic acid
DPPH	1,1-diphenyl-2-picrylhydrazyl
EDTA	ethylenediaminetetraacetic acid
e.g.	exempli gratia
et al.	et alli
Fe-NTA	ferric nitrilotriacetic acid
fl	femtoliter (s)
g	gram(s)
Hb	hemoglobin
HEK-N/F	human epidermal keratinocytes-Neonatal/Foreskin
HCT	hematocrit
Hg	mercury
HIV	human immunodeficiency virus

List of Abbreviations (Continued)

Abbreviation	Term
HOS-1	human osteosarcoma cell line
HPLC	high performance liquid chromatography
H ₂ O ₂	hydrogen peroxide
hr	hour
HSV	herpes simplex virus
IC ₅₀	concentration causing 50% inhibitory effect
kg	kilogram(s)
LD ₅₀	median lethal dose
LPO	lipid peroxidation
M	molar
MBC	mean bactericidal concentration
MCF-7	human breast adenocarcinoma cell line
MCHC	mean corpuscular hemoglobin concentration
MCMV	murine cytomegalovirus
MCV	mean corpuscular volume
mg	milligram(s)
MIC	mean inhibition concentration
min	minute(s)
ml	milliliter(s)
mM	millimolar(s)
MTT	3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide
n	number
<i>n</i> -BuOH	<i>n</i> -butanol
NiCl ₂	nickel chloride
nm	nanometer (s)
OECD	the organization of economic co-operation and development
Pb	lead

List of Abbreviations (Continued)

Abbreviation	Term
PC 3	human prostate cancer cell line
PNTIA	immortalized human prostate cell line
ppm	part per million
RBC	red blood cell
rpm	round(s) per minute
SEM	standard error of mean
SOD	superoxide dismutase
TBARS	thiobarbituric acid reactive substances
t-BuOH	tert-butyl hydroperoxide
<i>T. chebula</i>	<i>Terminalia chebula</i> Retz.
<i>T. bellerica</i>	<i>Terminalia bellerica</i> (Gaertn.) Roxb.
TRFs	terminal restriction fragments
UVB	ultraviolet B
WBC	white blood cell
WHO	the World Health Organization