

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	iii
ENGLISH ABSTRACT	iv
THAI ABSTRACT	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
ABBREVIATIONS	xiii
CHAPTER 1 INTRODUCTION	
Epidemiology of peptic ulcer disease	1
The pathophysiology of peptic ulcer disease	1
Physiological and pharmacological regulation of gastric secretion	6
Drug for treatment of peptic ulcer	9
Anti-gastric ulcer activity of plants	11
Anti-gastric ulcer activity of marine algae	12
Background of <i>Ulva reticulata</i> Forsskal	13
Purposes of the study	15
CHAPTER 2 MATERIALS AND METHODS	
Preparation of an aqueous extract of <i>Ulva reticulata</i> Forsskal	16
Laboratory Animals	16
Experimental models	18
Preparation of rats for experimental models	18
Induction of gastric ulcers	18
Restraint water immersion stress-induced	18
gastric ulcers in rats	

HCl/EtOH-induced gastric ulcers in rats	18
Indomethacin-induced gastric ulcers in rats	18
Histamine-induced gastric ulcers in rats	19
Evaluation of gastric ulcers	24
Pylorus ligation experiment	25
Gastric-wall mucus determination experiment	27
Isolated guinea-pig right atria experiment	30
Drugs and chemicals	32
Statistical analysis	32
CHAPTER 3 RESULTS	
Restraint water immersion stress-induced gastric ulcers in rats	33
HCl/EtOH-induced gastric ulcers in rats	36
Indomethacin-induced gastric ulcers in rats	39
Histamine-induced gastric ulcers in rats	42
Anti-gastric ulcer activity of the aqueous extract of <i>U. reticulata</i>	45
in various gastric ulceration models	
Pylorus ligation experiment	47
Gastric wall mucus with HCl/EtOH-induced gastric ulcers	49
in rats	
Isolated guinea-pig right atria experiment	51
CHAPTER 4 DISCUSSION	56
REFERENCES	62
VITA	73

LIST OF TABLES

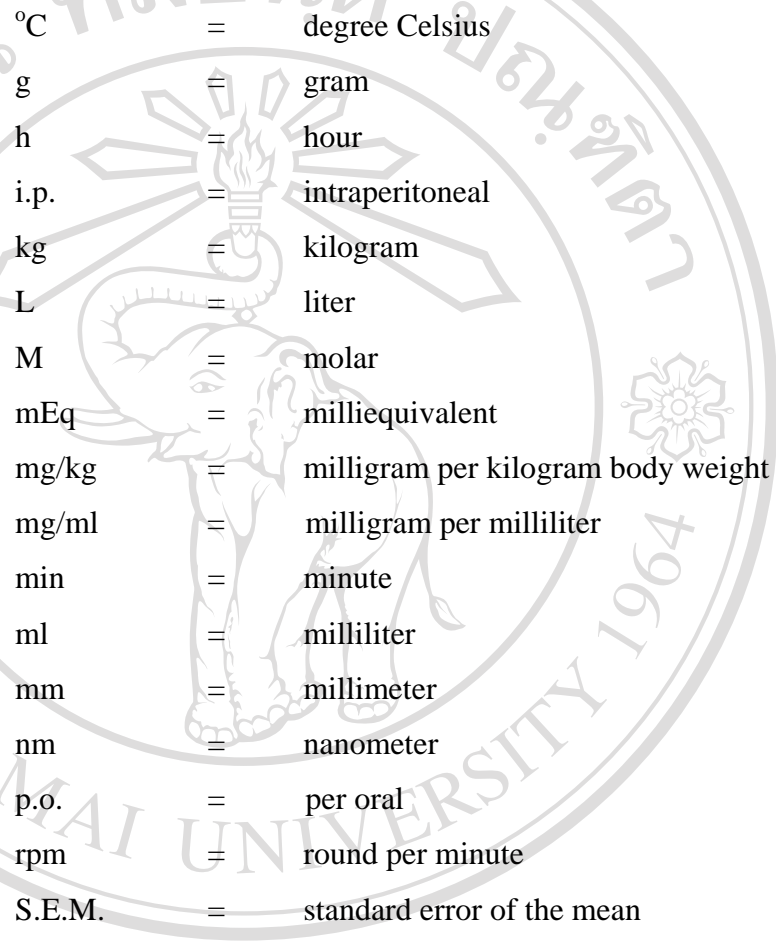
TABLE	PAGE
1. Effect of the aqueous extract of <i>U. reticulata</i> on restraint water immersion stress-induced gastric ulcers in rats	35
2. Effect of the aqueous extract of <i>U. reticulata</i> on HCl/Ethanol-induced gastric ulcers in rats	38
3. Effect of the aqueous extract of <i>U. reticulata</i> on indomethacin-induced gastric ulcers in rats	41
4. Effect of the aqueous extract of <i>U. reticulata</i> on histamine-induced gastric ulcers in rats	44
5. Effect of the aqueous extract of <i>U. reticulata</i> on gastric secretion in pylorus ligated rats	48
6. Effect of the aqueous extract of <i>U. reticulata</i> on gastric wall mucus content of rats with HCl/EtOH-induced gastric ulcers	50
7. The inhibitory effect of cimetidine and the aqueous extract of <i>U. reticulata</i> on histamine induced increased heart rate of the isolated right guinea-pig atria	54

LIST OF FIGURES

FIGURE	PAGE
1. The mechanism of HCl secretion by the gastric parietal cell	5
2. Physiological and pharmacological regulation of gastric secretion: the basis for therapy of peptic ulcer disease	8
3. Marine alga: <i>Ulva reticulata</i> Forsskal	14
4. Diagram illustrated the preparation of an aqueous extract of <i>U. reticulata</i>	17
5. Diagram illustrated the protocol of anti-gastric ulcer test using the restraint water immersion stress-induced gastric ulcer in rat experiment	20
6. Diagram illustrated the protocol of anti-gastric ulcer test using HCl/EtOH-induced gastric ulcer in rat experiment	21
7. Diagram illustrated the protocol of anti-gastric ulcer test using indomethacin-induced gastric ulcer in rat experiment	22
8. Diagram illustrated the protocol of anti-gastric ulcer test using histamine-induced gastric ulcer in rat experiment	23
9. Diagram illustrated the protocol of pylorus ligation in rat experiment	26
10. Diagram illustrated the protocol of gastric-wall mucus determination	28
11. Standard curve of concentration-absorbance of alcian blue	29
12. Diagram illustrated the set up of isolated guinea pig right atria experiment	31
13. Gastric ulcers induced in rats by restraint water immersion stress	34
14. Gastric ulcers induced in rats by HCl/EtOH	37
15. Gastric ulcers induced in rats by indomethacin	40
16. Gastric ulcers induced in rats by histamine	43

17. Anti-gastric ulcer activity (% inhibition of gastric ulcer formation) of the aqueous extract of <i>U. reticulata</i> at the dose of 500 mg/kg in different gastric ulceration models	46
18. Effect of cimetidine on histamine induced increased heart rate of isolated guinea-pig right atria	52
19. Effect of the aqueous extract of <i>U. reticulata</i> on histamine induced increased heart rate of isolated guinea-pig right atria	53
20. Concentration-response (the inhibitory effect of the aqueous extract of <i>U. reticulata</i> and cimetidine on histamine induced increased heart rate of the isolated guinea-pig right atria) regression lines of the aqueous extract of <i>U. reticulata</i> and cimetidine	55

ABBREVIATIONS



°C	=	degree Celsius
g	=	gram
h	=	hour
i.p.	=	intraperitoneal
kg	=	kilogram
L	=	liter
M	=	molar
mEq	=	milliequivalent
mg/kg	=	milligram per kilogram body weight
mg/ml	=	milligram per milliliter
min	=	minute
ml	=	milliliter
mm	=	millimeter
nm	=	nanometer
p.o.	=	per oral
rpm	=	round per minute
S.E.M.	=	standard error of the mean
uEq	=	microequivalent
ug	=	microgram
ug/ml	=	microgram per milliliter

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
 Copyright© by Chiang Mai University
 All rights reserved