

ประสิทธิภาพของโพลีแซคคาไรด์ที่ใช้ในอุตสาหกรรมอาหารในการจับไนโตรท

และยับยั้งการเกิดสารก่อกลายพันธุ์จากอะมิโนพีรีนและไนโตรท

นางสาวพรพรรณ วุฒิกรวณิชย์



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**NITRITE SCAVENGING ACTIVITY AND ANTIFORMATION OF MUTAGENS  
FROM AMINOPYRENE TREATED WITH NITRITE BY POLYSACCHARIDES  
CURRENTLY USED IN FOOD INDUSTRIES**

**Miss Pornphan Wuthikornwanit**

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**By** Miss Pornphan Wuthikornwanit

**Department** Food Chemistry



**Thesis Advisor** Associate Professor Oranong Kangsadalampai, Ph.D.

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Accepted by the Graduate School, Chulalongkorn University in Partial  
Fulfillment of the Requirements for the Master's Degree.

Handwritten signature of Supawat Chutivongse in black ink.

.....Dean of Graduate School

(Professor Supawat Chutivongse, M.D.)

Thesis Committee

Handwritten signature of Suthee Sunthornthum in black ink.

.....Chairman  
(Suthee Sunthornthum, M.Sc.)

Handwritten signature of Oranong Kangsadalampai in black ink.

.....Thesis Advisor  
(Assoc.Prof.Oranong Kangsadalampai, Ph.D.)

Handwritten signature of Kaew Kangsadalampai in black ink.

.....Member  
(Assoc.Prof.Kaew Kangsadalampai, Ph.D.)

พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว



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โพลีแซคคาไรด์ที่ใช้ในอุตสาหกรรมอาหารถูกเลือกมา 13 ชนิด เพื่อศึกษาความสามารถในการจับไนไตรทและการยับยั้งการเกิดสารก่อกลายพันธุ์จากอะมิโนพิรีน โดยใช้วิธีของเฮมส์ (ไม่เติมเอ็นไซม์กระตุ้นสารพิษ) ผลที่ได้จากการศึกษานี้พบว่า โพลีแซคคาไรด์ มีผลน้อยมากหรือไม่มีผลต่อการจับไนไตรท โพลีแซคคาไรด์จาก รุน คาร์บอซิมเมทิลเซลลูโลส กัวร์กัม กัมอะราบิก โลกซ์บีนกัม เมทิลเซลลูโลสที่มีความหนืด 25, 1500, 4000 และเพกตินไม่สามารถยับยั้งการเกิดสารก่อกลายพันธุ์ที่เกิดจากอะมิโนพิรีนแต่ทำให้การกลายพันธุ์เพิ่มขึ้นด้วย ส่วนคาร์ราจีแนน โซเดียมแอลจีเนท แซนแทนกัม และแอลฟาเซลลูโลสมีผลยับยั้งการเกิดสารก่อกลายพันธุ์ นอกจากนี้ยังพบว่า เมทิลเซลลูโลสที่มีความหนืด 25, 1500, และ 4000 จับอะมิโนพิรีนได้ดีกว่าโพลีแซคคาไรด์ตัวอื่น ผลของโพลีแซคคาไรด์ต่อความสามารถในการจับไนไตรทและยับยั้งการเกิดสารก่อกลายพันธุ์ขึ้นกับชนิดของเส้นใย

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THESIS ADVISOR : ASSOC. PROF. ORANONG KANGSADALAMPAI, Ph.D.  
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The main purpose of this study was to investigate nitrite scavenging activity of polysaccharides used in food industries and antiformation of mutagens of aminopyrene treated with nitrite. The thirteen polysaccharides have been selected to be evaluated on their nitrite scavenging activity and antiformation of mutagen of aminopyrene-nitrite model using Ames test (without the addition of activating system). The results of this study suggested that all of polysaccharides had little or no nitrite scavenging activity. Agar, carboxymethylcellulose, guar gum, gum arabic, locust bean gum, methylcellulose 25 cps, 1500 cps, 4000 cps, and pectin could not inhibit the mutagenicity of aminopyrene-nitrite model; however, they increase the mutagenicity of this model. Carrageenan, sodium alginate, xanthan gum, and  $\alpha$ -cellulose showed their inhibitory effect of mutagenicity of the model. In addition methylcellulose 25 cps, 1500 cps, and 4000 cps were more firmly bound to aminopyrene than the others. It was suggested that effect of polysaccharides on nitrite scavenging activity and antiformation depended on the type of fiber.

ภาควิชา.....

สาขาวิชา.....

ปีการศึกษา.....

ลายมือชื่อนิสิต..... PORNPHAN WUTHIKORNWANIT

ลายมือชื่ออาจารย์ที่ปรึกษา..... ORANONG KANGSADALAMPAI

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## CONTENTS

	PAGE
ABSTRACT (THAI).....	iv
ABSTRACT (ENGLISH).....	v
ACKNOWLEDGEMENTS.....	vi
CONTENTS.....	vii
LIST OF FIGURES.....	viii
LIST OF TABLES.....	xiii
LIST OF ABBREVIATIONS.....	xiv
CHAPTER I INTRODUCTION.....	1
CHAPTER II REVIEW OF LITERATURE.....	4
CHAPTER III MATERIALS AND METHODS.....	26
CHAPTER IV RESULTS AND DISCUSSION.....	36
REFERENCES.....	69
APPENDIX 1.....	78
APPENDIX 2.....	91
VITA.....	106

## LIST OF FIGURES

<b>Figure</b>	<b>Pages</b>
2.1 A hypothesis for the causation of gastric cancer	5
2.2 Formation of nitrosamines and nitrosamides under acidic conditions	10
2.3 N-nitroso compounds formed from (a) amines, (b) amides and (c) ureas. R, R' = alkyl, aryl or part of a cyclic structure	10
2.4 Structure of 1-nitrosopyrene and 1-aminopyrene	13
3.1 Steps in colorimetric determination nitrite scavenging evaluation	29
3.2 Steps in mutagenicity evaluation using the Ames test (pre-incubation method)	31
3.3 Steps in antiformation of mutagens study using Ames test	33
3.4 Steps in evaluation the aminopyrene binding strength of fibers. After an one-hour incubation, 1 ml of the mixture was remove (Portion A). The left over was either added with 1 ml sterile water (Portion B) or remained as it was (Portion C). All three portions were tested for their mutagenicity using Ames test	35
4.1 The effect of polysaccharides on the disappearance of nitrite (320 $\mu$ M)	38
4.2 The effect of agar on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	43



	<b>Figure</b>	<b>Pages</b>
4.3	The effect of carboxymethylcellulose on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	44
4.4	The effect of guar gum on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	45
4.5	The effect of gum arabic on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	46
4.6	The effect of locust bean gum on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	47
4.7	The effect of methylcellulose 25 cps on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	48

<b>Figure</b>	<b>Pages</b>
4.8 The effect of methylcellulose 1500 cps on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	49
4.9 The effect of methylcellulose 4000 cps on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	50
4.10 The effect of pectin on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	51
4.11 The effect of carrageenan on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	52
4.12 The effect of sodium alginate on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	53

<b>Figure</b>	<b>Pages</b>
4.13 The effect of xanthan gum on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	54
4.14 The effect of $\alpha$ -cellulose on the mutagenicity of the incubation mixture of 10 $\mu$ l of 0.05 mM aminopyrene and 250 $\mu$ l of 2 M nitrite (pH 3.0, 4 h) in the absence of activating system. Data expressed as means (and standard deviations in parenthesis) of the revertants per plate.	55
4.15 The aminopyrene binding strength of agar. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	60
4.16 The aminopyrene binding strength of carboxymethylcellulose. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	61
4.17 The aminopyrene binding strength of guar gum. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	62
4.18 The aminopyrene binding strength of gum arabic. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	63
4.19 The aminopyrene binding strength of locust bean gum. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	64
4.20 The aminopyrene binding strength of pectin. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	65

	<b>Figure</b>	<b>Pages</b>
4.21	The aminopyrene binding strength of methylcellulose 25 cps. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	66
4.22	The aminopyrene binding strength of methylcellulose 1500 cps. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	67
4.23	The aminopyrene binding strength of methylcellulose 4000 cps. Data expressed as means (and standard deviations in parenthesis) of revertants per plate.	68

## LIST OF TABLES

Tables	Pages
2.1 Mutagenicity of aminopyrene treated with nitrite (500 mM) in gastric like condition on <i>Salmonella typhimurium</i> TA 98 and TA 100	14
2.2 Classification of major dietary fiber components	17
2.3 Genotypes of the TA strains used for mutagenesis testing	25

## LIST OF ABBREVIATIONS

$\mu\text{g}$	microgram
$\mu\text{l}$	microlitre
$\mu\text{M}$	micromole
cps	centipoise
h	hour
His <sup>+</sup>	histidine prototrophy
M	molar
mg	milligram
min	minute
ml	millilitre
mM	millimole
MW	molecular weight
N	normality
ND	not determined
nm	nanometre
°C	degree celcius
rpm	rounds per minute