

องค์ประกอบทางเคมีและฤทธิ์การยับยั้งเชื้อรา *Ascosphaera apis*  
ของพรอพอลิสจากรังชันโรง

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**CHEMICAL COMPOSITIONS AND ANTIFUNGUS *Ascosphaera apis*  
OF PROPOLIS FROM NEST OF STINGLESS BEE**

**Miss Chayanee Ot-sup**

**A Thesis Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Science Program in Biotechnology**

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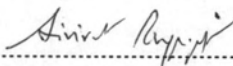
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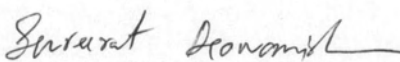


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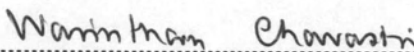
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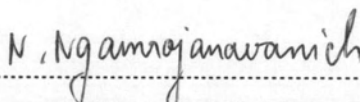
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ชญาณี อ้อคทรัพย์ : องค์ประกอบทางเคมีและฤทธิ์การยับยั้งเชื้อรา *Ascospaera apis* ของพรอโพลิสจากรังชันโรง. (CHEMICAL COMPOSITIONS AND ANTIFUNGUS *Ascospaera apis* OF PROPOLIS FROM NEST OF STINGLESS BEE) อ. ที่ปรึกษา: ผศ. ดร. สุวีรัตน์ เตียววณิชย์, อาจารย์ที่ปรึกษาร่วม: ผศ. ดร. วรินทร์ ชวศิริ, 86 หน้า.

พรอโพลิสจากรังชันโรง *Trigona laeviceps* ที่เก็บจากร้อยเอ็ด ประเทศไทย ได้ถูกนำมาสกัดด้วยไดคลอโรมีเทน และทดสอบฤทธิ์การยับยั้งการเจริญเติบโตของเชื้อรา *Ascospaera apis* ที่ก่อโรคซอกัลบรูค พบว่า ที่ความเข้มข้น 190 ppm ของสารสกัดสามารถยับยั้งการเจริญเติบโตของเชื้อราได้ 50 เปอร์เซ็นต์ และที่ความเข้มข้น 250 ppm ของสารสกัดสามารถยับยั้งการเจริญเติบโตของเชื้อราได้ 100 เปอร์เซ็นต์ ได้แยกสิ่งสกัดไดคลอโรมีเทนด้วยคอลัมน์โครมาโทกราฟีได้ 7 ส่วนย่อย สารสกัดที่แยกได้ในส่วนที่ 3 และ 4 สามารถยับยั้งการเจริญเติบโตของ *Ascospaera apis* ได้โดยใช้วิธี TLC autographic เมื่อนำพรอโพลิสมาวิเคราะห์หาองค์ประกอบด้วย gas chromatography-mass spectrometer พบว่าสารที่น่าจะเป็นองค์ประกอบคือ 2-methylpropyl ester, camphor, 2, 4 - bis (dimethylbenzyl) - 6 - *t*-butylphenol, 1H- cycloprop[e]azulen-7-ol, 6-oxohuperzine A และ 2,6-diphenyl-1,7-dihydrodipyrrolo[2,3-b:3',2'-E]pyridine สารที่ออกมาที่ Rt 13.02 นาที เป็นองค์ประกอบหลักในพรอโพลิส แต่ไม่มีข้อมูลตรงกับฐานข้อมูลของ Wiley ถึงแม้ว่า camphor ซึ่งเป็นส่วนประกอบหลักของส่วนที่ 3 การทดสอบฤทธิ์ยับยั้งการเจริญเติบโตของเชื้อรา แสดงให้เห็นว่า camphor ไม่สามารถยับยั้งการเจริญเติบโตของเชื้อรา *Ascospaera apis*

สาขาวิชา.....เทคโนโลยีชีวภาพ..... ทยมือชื่อนิสิต..... ชญาณี อ้อคทรัพย์.....  
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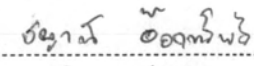
CHAYANEE OT-SUP : CHEMICAL COMPOSITIONS AND ANTIFUNGUS

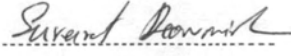
*Ascospaera apis* OF PROPOLIS FROM NEST OF STINGLESS BEE. THESIS

ADVISOR: ASST. PROF. SUREERAT DEOWANISH, D. Agr. THESIS

CO-ADVISOR : ASST. PROF. WARINTHORN CHAVASIRI Ph.D. 86 pp.

Propolis of stingless bee was collected from the nest of *Trigona laeviceps* in Roi Et, Thailand. The dichloromethane crude extract was tested for antifungal activity of the chalkbrood disease, *Ascospaera apis*. At the concentration of 190 ppm of crude, 50% growth inhibition was observed and 100% growth inhibition could be found at the concentration of 250 ppm. The dichloromethane was further separated into 7 fractions by column chromatography. Fractions 3 and 4 showed the growth inhibition against *Ascospaera apis* by TLC autographic technique. The chemical compositions of propolis sample were analyzed by gas chromatography-mass spectrometer. GC-MS suggested the possible components including 2-methylpropyl ester, camphor, 2, 4 - bis (dimethylbenzyl) - 6 - *t*- butylphenol, 1H- cycloprop[e]azulen-7-ol, 6- oxohuperzine A and 2,6-diphenyl-1,7-dihydrodipyrrolo[2,3-b:3',2'-E]pyridine. The compound at Rt 13.02 minute was a major constituent in the propolis, but it did not match with the data available in Wiley database. Although camphor was the major constituent in fraction 3, the antifungal activity of camphor did relatively not inhibit the growth of *Ascospaera apis*.

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**LIST OF ABBREVIATIONS**

°C	degree celsius
CH <sub>2</sub> Cl <sub>2</sub>	dichloromethane
cm	centimeter
DMSO	dimethylsulfoxide
EtOAc	ethyl acetate
g	gram
GCMS	gas chromatography mass spectrometer
MeOH	methanol
mg	milligram
ml	milliliter
No.	number
PDA	potato dextrose agar
PDB	potato dextrose broth
ppm	part per million
sp.	species
TLC	Thin-Layer Chromatography
w/w	weight by weight
μl	microliter
UV	ultraviolet