

**CONVERSION OF CORNCOB TO SUGARS BY MICROBIAL
HYDROLYSIS**



Wannaporn Eourarekullart


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By: Wannaporn Eourarekullart
Program: Petrochemical Technology
Thesis Advisors: Assoc. Prof. Pramoch Rangsunvigit
Prof. Sumaeth Chavadej
Asst. Prof. Thammanoon Sreethawong
Assoc. Prof. Sirirat Rengpipat

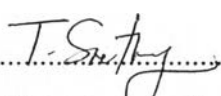
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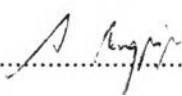

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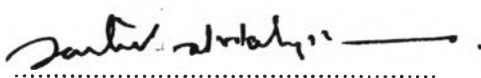
Thesis Committee:



.....
(Assoc. Prof. Pramoch Rangsunvigit)


.....
(Prof. Sumaeth Chavadej)


.....
(Asst. Prof. Thammanoon Sreethawong)


.....
(Assoc. Prof. Sirirat Rengpipat)


.....
(Prof. Suntud Sirianuntapiboon)


.....
(Assoc. Prof. Thirasak Rirksomboon)

ABSTRACT

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Wannaporn Eourarekullart: Conversion of Corncob to Sugars by
Microbial Hydrolysis

Thesis Advisors: Assoc. Prof. Pramoch Rangsunvigit, Prof. Sumaeth
Chavadej, Asst. Prof. Thammanoon Sreethawong, and Assoc. Prof.
Sirirat Rengpipat 58 pp.

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The possibility of using corncob as a raw material for enzymatic hydrolysis to sugars was investigated. The effects of particle size of corncob, hydrolysis temperature, hydrolysis time, and strains of bacteria isolated from Thai higher termites were studied. In the experiments, 1.5-1.6 g of corncob obtained from River Kwai International Food Industry Co., Ltd., 4-7 g of bacteria cells, and 1 L of production medium were used. The studied parameters included the particle size of corncob (40 and 60 mesh), temperature (30 and 37 °C), and bacteria strain (A 002 and M 015) isolated from Thai higher termites, *Microcerotermes* sp. The products were identified and analyzed by a high performance liquid chromatography (HPLC) with a refractive index detector. Cellulose, hemicellulose, lignin, and extractive contents of the raw corncob were 47.37, 31.26, 17.06, and 3.32%, respectively. The maximum amount of glucose from the hydrolysis reaction with strain A 002 bacteria and 60 mesh size corncob at 37 °C was 1.08 g/L.

บทคัดย่อ

วรรณพร เอื้ออารีย์กุลเลิศ : การเปลี่ยนแปลงซังข้าวโพดไปเป็นน้ำตาลโดยการย่อยด้วยแบคทีเรีย (Conversion of Corncob to Sugars by Microbial Hydrolysis) อ. ที่ปรึกษา: รศ. ดร. ปราโมช รั้งสรรค้วจิตร ศ. ดร. สุเมธ ชวเดช ผศ. ดร. ธรรมบุญ ศรีทะวงศ์ และ รศ. ดร.ศิริรัตน์ เร่งพิพัฒน์ 58 หน้า

งานวิจัยนี้วิเคราะห์ความเป็นไปได้ของการใช้ซังข้าวโพดเพื่อเป็นวัตถุดิบตั้งต้นสำหรับกระบวนการย่อยด้วยเอนไซม์ ให้เป็นน้ำตาล โดยแบคทีเรียที่แยกได้จากปลวกชั้นสูง ในการทดลองนี้ ใช้ซังข้าวโพดปริมาณ 1.5-1.6 กรัม (บริษัท ริเวอร์แคว อินเตอร์เนชั่นแนล อุตสาหกรรมอาหาร จำกัด) เซลล์ของแบคทีเรียปริมาณ 4-7 กรัม และตัวกลางที่มีอาหารเลี้ยงเชื้อปริมาณ 1 ลิตร ตัวแปรที่ศึกษาประกอบด้วยอนุภาคของซังข้าวโพดขนาด 60 และ 40 เมช ที่อุณหภูมิ 30 และ 37 องศาเซลเซียส และแบคทีเรียสายพันธุ์เอ 002 และ เอ็ม 015 ผลึกภัณฑ์ที่ได้วิเคราะห์โดยเครื่อง HPLC (high performance liquid chromatography) ที่ใช้ตัววัดแบบ Refractive Detector จากการวิเคราะห์พบว่าสัดส่วนองค์ประกอบของซังข้าวโพดที่ใช้ประกอบด้วยเซลลูโลสร้อยละ 47.37 เฮมิเซลลูโลสร้อยละ 31.26 ลิกนินร้อยละ 17.06 และ เอ็กซ์แทรกที่ร้อยละ 3.32 สภาวะการย่อยซังข้าวโพดขนาด 60 เมชด้วยแบคทีเรียสายพันธุ์เอ 002 ที่ 37 องศาเซลเซียส ให้ปริมาณน้ำตาลกลูโคสสูงที่สุดที่ 1.08 กรัมต่อลิตร

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