

**GLUCOSE EVOLUTION FROM CASSAVA RESIDUE BY MICROBIAL
HYDROLYSIS USING BACTERIA ISOLATED FROM THAI HIGHER
TERMITES**



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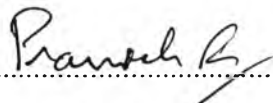
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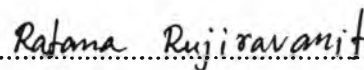
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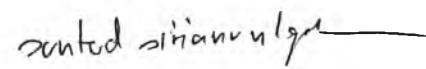

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ABSTRACT

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The possibility of using cassava residue from a bioethanol plant containing 49.66 % starch, 21.47 % cellulose, 12.97 % hemicellulose, and 21.86 % lignin as a raw material to produce glucose using enzymatic hydrolysis was investigated. In the experiment, each reactor contained cassava residue, bacteria cells, and production medium. The effects of particles size (40 mesh, 60 mesh and 80 mesh), strain of bacteria (A002 and M015) isolated from Thai higher termites, *Microcerotermes* sp., reaction temperature (30°C and 37°C), and concentration of secondary carbon source on the sugars concentration were tested. High performance liquid chromatography was used to determine the quantity of sugars. The maximum sugar concentration obtained at 30 °C using strain A002 and 80 mesh cassava residue was 1.44 g/L at 7 h. The optimum quantity of malt extract was 10 g/L.

บทคัดย่อ

พิชชา วงษ์แก้ว: การผลิตกลูโคสจากกากมันสำปะหลังโดยใช้แบคทีเรียจากปลวกชั้นสูง (Glucose Evolution from Cassava Residue by Microbial Hydrolysis Using Bacteria Isolated from Thai Higher Termites) อ. ที่ปรึกษา: รศ. ดร. ปราโมช รังสรรค์วิจิตร และ ศ. ดร. สุเมธ ชวเดช 84 หน้า

งานวิจัยนี้วิเคราะห์ความเป็นไปได้ในการผลิตกลูโคส โดยใช้แบคทีเรียจากปลวกชั้นสูงเพื่อย่อยกากมันสำปะหลัง ซึ่งเป็นผลิตภัณฑ์เหลือใช้ จาก บริษัท ทรัพย์ทิพย์ จำกัด กากมันสำปะหลัง ที่ศึกษาประกอบด้วย คาร์โบไฮเดรต 49.66 % เซลลูโลส 21.47 % เฮมิเซลลูโลส 12.97 % และลิกนิน 21.86 % กระบวนการผลิตกลูโคสในเครื่องปฏิกรณ์ ซึ่งประกอบด้วย กากมันสำปะหลัง แบคทีเรีย และแหล่งอาหารของ แบคทีเรีย การทดลองศึกษาผลกระทบของตัวแปรต่างๆ ดังนี้ ขนาดของกาก มันสำปะหลัง 40 60 และ 80 เมช สายพันธุ์แบคทีเรียจากปลวกชั้นสูง ชนิด เอ 002 และเอ็ม 015 อุณหภูมิที่ใช้ในการย่อย ที่ 30 และ 37 องศาเซลเซียส และปริมาณแหล่งอาหารของแบคทีเรีย โดยการ ลดปริมาณของมอลต์ สกัด จากปกติ 10 กรัมต่อลิตร เหลือ 5 กรัมต่อลิตร และ 1 กรัมต่อลิตร ผลิตภัณฑ์ที่ได้วิเคราะห์โดย เครื่อง HPLC (high performance liquid chromatography) โดยสถานะ ที่ให้ปริมาณกลูโคสสูงสุด ที่ 1.44 กรัมต่อลิตร คือ การย่อยกากมันสำปะหลังขนาด 80 เมชด้วย แบคทีเรียสายพันธุ์ เอ 002 ที่ 30 องศาเซลเซียส และปริมาณมอลต์สกัดที่เพียงพอสำหรับ แบคทีเรีย คือ 10 กรัมต่อลิตร

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