

การผลิตคาร์บอกซีเมทิลเซลลูโลสจากเจลเซลลูโลสโดย *Acetobacter xylinum*

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CARBOXYMETHYLCELLULOSE PRODUCTION FROM CELLULOSIC GEL

BY *Acetobacter xylinum*

MISS KORNWIKA SUKSRIWONG

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science

Programme of Biotechnology

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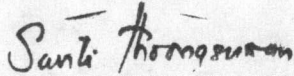
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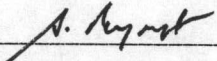
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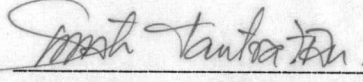
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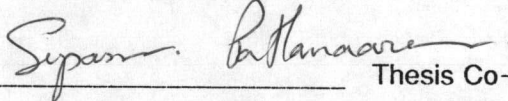
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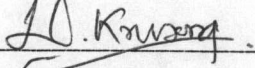
  
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พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

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งานวิจัยนี้มีจุดประสงค์เพื่อศึกษาปัจจัยที่มีผลต่อการสร้างเจลเซลลูโลสของ *A. xylinum* และเพื่อศึกษาถึงภาวะที่เหมาะสมในการผลิตคาร์บอกซีเมทิลเซลลูโลสจากเจลเซลลูโลส

จากการศึกษาความสามารถในการสร้างเจลเซลลูโลสของ *A. xylinum* สามสายพันธุ์คือ AGR60 DK และ ST พบว่า สายพันธุ์ ST เป็นสายพันธุ์ที่สร้างเจลเซลลูโลสได้สูงสุด สำหรับชนิดของน้ำตาลที่เหมาะสมในการผลิตเจลเซลลูโลสคือ น้ำตาลกลูโคส ซูโครส และ ฟรุกโตส การผลิตเจลเซลลูโลสในอาหารน้ำมะพร้าวให้ปริมาณผลผลิตเจลเซลลูโลสที่สูงกว่าการผลิตในอาหารสังเคราะห์ โดยขนาดพื้นที่ผิวของอาหารน้ำมะพร้าวที่ใช้เลี้ยง *A. xylinum* เพื่อให้เชื่อมีความสามารถในการสร้างเจลเซลลูโลสได้ในปริมาณสูงสุดคือ 168.75 และ 337.5 ตารางเซนติเมตร

ภาวะที่เหมาะสมในการผลิตคาร์บอกซีเมทิลเซลลูโลสจากเจลเซลลูโลสคือ ใช้อัตราส่วนของเจลเซลลูโลสผงต่อน้ำกลั่นคือ 1.0 : 2.0 (น้ำหนักต่อปริมาตร) อัตราส่วนของเจลเซลลูโลสผงต่อโซเดียมไฮดรอกไซด์ต่อโซเดียมคลอไรด์คือ 1.0 : 3.0 : 0.44 โดยน้ำหนัก ทำการผสมส่วนผสมทั้งหมด 6 ชั่วโมง บ่มที่อุณหภูมิห้อง 36 ชั่วโมง แล้วละลายส่วนผสมในน้ำร้อนโดยใช้อัตราส่วนของส่วนผสมต่อน้ำร้อนคือ 1.0 : 12.5 จากนั้นตกตะกอนด้วยเอธานอล โดยให้ความเข้มข้นสุดท้ายเป็นร้อยละ 70 จากการศึกษาพบว่าความหนืดของสารละลายของคาร์บอกซีเมทิลเซลลูโลสที่ความเข้มข้นร้อยละ 1 ที่อุณหภูมิ 25 องศาเซลเซียส มีค่า 334 เซนติพอยส์ และมีค่าองศาการแทนที่เท่ากับ 0.48

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ปีการศึกษา 2538 .....

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## C626705 : MAJOR BIOTECHNOLOGY

KEY WORD: CELLULOSIC GEL/Acetobacter xylinum/CARBOXYMETHYLCELLULOSE  
KORNWIKA SUKSRIWONG : CARBOXYMETHYLCELLULOSE  
PRODUCTION FROM CELLULOSIC GEL BY Acetobacter xylinum.  
THESIS ADVISOR : SUMATE TANTRATIAN, Ph.D. THESIS CO-ADVISOR:  
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This research has the objective to study the various factors affecting cellulosic gel production by A. xylinum and to study the optimum conditions of CMC production from cellulosic gel.

Cellulosic gel forming ability of A. xylinum was depend upon A. xylinum strains. The ST strain could form the highest amount of cellulosic gel when compared with DK and AGR60 strains. The suitable kinds of sugar using as C-source for A. xylinum were glucose, sucrose and fructose. It was found that the cellulosic gel formation of these three strains in coconut water medium provided the higher yield than in synthetic medium. The surface of medium influenced on the gel forming ability. The maximum cellulosic gel were obtained from the 168.75 and 337.5 cm<sup>2</sup> of surface area of medium.

The optimum conditions of CMC production were as followed : the ratio of nata cellulose powder : distilled water of 1.0:2.0(w/v) and the ratio of nata cellulose powder : NaOH : ClCH<sub>2</sub>COONa of 1.0:3.0:0.44. The reaction mixture was mixed for 6 hours and incubated at room temperature for 36 hours. The reaction mixture was dissolved in hot water by the ratio of 1.0 :12.5 of the reaction mixture to hot water and precipitated by 70% final concentration of ethanol. The viscosity of 1% of CMC solution at 25°C and DS of CMC obtained were 334 cP and 0.48, respectively.

ภาควิชา.....

สาขาวิชา.....

ปีการศึกษา 2533.....

ลายมือชื่อนิสิต.....

ลายมือชื่ออาจารย์ที่ปรึกษา.....

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....



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