

การใช้ไคตินและไคโตแซนเป็นสารช่วยแตกตัวในยาเม็ดนาราเซตตามอล



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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาเภสัชศาสตรมหาบัณฑิต

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บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

พ.ศ. 2535

ISBN 974-581-300-1

ลิขสิทธิ์ของบัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

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APPLICATION OF CHITIN AND CHITOSAN AS DISINTEGRANT
IN PARACETAMOL TABLET



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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Pharmacy
Department of Manufacturing Pharmacy
Graduate School
Chulalongkorn University

1992

ISBN 974-581-300-1

Thesis Application of Chitin and Chitosan as
 Disintegrant in Paracetamol Tablet
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พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

ปาริชาติ ชมโท : การใช้ไคตินและไคโตแซนเป็นสารช่วยแตกตัวในยาเม็ดพาราเซตามอล
(APPLICATION OF CHITIN AND CHITOSAN AS DISINTEGRANT IN
PARACETAMOL TABLET) อ. ที่ปรึกษา : รศ.ดร. กาญจน์พิมล ฤทธิเดช, 179 หน้า
ISBN 974-581-300-1

การศึกษาคุณสมบัติในการเป็นสารช่วยแตกตัวของไคตินและไคโตแซนจากแหล่งผลิตต่างกัน
เปรียบเทียบกับสารช่วยแตกตัวอื่นที่ใช้กันอย่างแพร่หลาย 4 ชนิด ได้แก่ corn starch, sodium starch
glycolate, microcrystalline cellulose และ croscarmellose sodium โดยศึกษาถึงคุณสมบัติทาง
กายภาพในผงสารช่วยแตกตัว ได้แก่ ความสามารถในการพองตัว, ขนาดและการกระจายขนาดอนุภาค
และในสารช่วยแตกตัวที่ตอกอัดเป็นเม็ด ได้แก่ การคูกุน้ำ โดยศึกษาถึงเวลาในการแตกตัวและผลการ
ละลายของตำรับยาเม็ดพาราเซตามอล ซึ่งผลิตด้วยกรรมวิธีการทำแกรนูลเปียกโดยใช้สารช่วยแตกตัว
ในปริมาณต่าง ๆ กัน นำมาตอกอัดด้วยแรงระดับต่างกัน 2 ระดับ ทั้งก่อนและหลังการเก็บในสภาวะ
ความชื้นสัมพัทธ์ 75% อุณหภูมิ 45 °C

ผลการทดลองแสดงให้เห็นว่าไคตินและไคโตแซนมีขนาดอนุภาคใหญ่และการกระจายขนาด
อนุภาคกว้างกว่าสารช่วยแตกตัวอื่น ความสามารถในการพองตัวในน้ำและกรดเกลือเจือจางมีมากกว่า
corn starch และ microcrystalline cellulose แต่น้อยกว่า sodium starch glycolate และ
croscarmellose sodium ไคตินและไคโตแซนมีการคูกุน้ำได้มากกว่า sodium starch glycolate
เวลาในการแตกตัวของยาเม็ดที่ประกอบด้วยไคตินและไคโตแซนจะช้ากว่ายาเม็ดที่ประกอบด้วย sodium
starch glycolate และ croscarmellose sodium แต่เร็วกว่ายาเม็ดที่ประกอบด้วย corn starch
และ microcrystalline cellulose ที่ระดับความเข้มข้นและแรงตอกเดียวกัน การเพิ่มความเข้มข้นของ
ไคตินและไคโตแซนในตำรับจะช่วยลดเวลาในการแตกตัวของยาเม็ดที่ประกอบด้วยไคโตแซนจะมีเวลาการ
แตกตัวเร็วกว่ายาเม็ดที่ประกอบด้วยไคติน ผลการละลายของยาเม็ดที่ประกอบด้วยไคตินและไคโตแซน 5%
และ 7% ผ่านตามข้อกำหนดของเภสัชตำรับสหรัฐอเมริกา ไคตินและไคโตแซนจากแหล่งผลิตต่างกันจะ
มีผลต่อคุณสมบัติทางกายภาพเล็กน้อย ยาเม็ดที่ประกอบด้วย 7% ไคโตแซนจะแตกตัวภายใน 1 นาที
และปริมาณการละลายของตัวยาในเวลา 30 นาที ใกล้เคียงกับยาเม็ดที่ประกอบด้วย sodium starch
glycolate และ croscarmellose sodium สภาวะความชื้นสัมพัทธ์และอุณหภูมิสูงมีผลต่อคุณสมบัติ
ทางกายภาพของยาเม็ดที่ประกอบด้วยไคตินและไคโตแซน กลไกในการช่วยแตกตัวของไคตินและไคโตแซน
อาจเนื่องมาจากความสามารถในการคูกุน้ำเข้าไปในยาเม็ด และความสามารถในการพองตัวของอนุภาค
ของสารทั้งสอง



ภาควิชา เภสัชอุตสาหกรรม
สาขาวิชา
ปีการศึกษา 2534

ลายมือชื่อนิสิต ปาริชาติ ชมโท
ลายมือชื่ออาจารย์ที่ปรึกษา
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม



C375175 : MANUFACTURING PHARMACY

KEY WORD : CHITIN/CHITOSAN/DISINTEGRANT/PARACETAMOL TABLET

PARICHAT CHOMTO : APPLICATION OF CHITIN AND CHITOSAN AS
DISINTEGRANT IN PARACETAMOL TABLET. THESIS ADVISOR :

ASSO. PROF. GARNPIMOL C. RITTHIDEJ, Ph.D., 179 PP.

ISBN 974-581-300-1

Disintegration properties of chitin and chitosan from two sources were in comparison to four commonly used disintegrants; corn starch, sodium starch glycolate, microcrystalline cellulose and croscarmellose sodium. Physical properties of disintegrant powders; swelling capacity, particle size and size distribution, and of pure disintegrant tablets; water uptake were determined. Paracetamol tablets containing different levels of disintegrants and prepared by wet granulation method with two levels of compressional forces were evaluated for their disintegration time and drug dissolution both before and after exposure to 75% RH and 45 °C

The results clearly showed chitin and chitosan had larger size and wide range of size distribution than other disintegrants. Their swelling capacity in deionized water, similar to in diluted hydrochloric acid, were greater than corn starch and microcrystalline cellulose but lower than sodium starch glycolate and croscarmellose sodium. Chitin and chitosan exhibited high water uptake but less than sodium starch glycolate. The disintegration time of these tablets were longer than those of sodium starch glycolate and croscarmellose sodium but shorter than those of corn starch and microcrystalline cellulose at the same concentration and compressional force. The increment in concentration of them caused faster disintegration time. Tablets containing chitosan had shorter disintegration time than those of chitin. Drug dissolution of 5% or more of chitin and chitosan tablets complied with the requirements of the US standard. Different sources of chitin and chitosan had a little effect on physical properties. Tablets made with 7% chitosan disintegrated within 1 minute and their percent drug dissolved in 30 minutes were similar to sodium starch glycolate and croscarmellose sodium tablets. Aging slightly affected physical properties of chitin and chitosan tablets. The possible mechanisms of disintegration in the case of chitin and chitosan were the ability to accelerate water penetration into tablets and swelling ability of their particles.

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ACKNOWLEDGEMENTS

I would like to express my sincere appreciation and gratitude to my advisor, Associate Professor Dr. Garnpimol C. Ritthidej, Department of Manufacturing Pharmacy, Faculty of Pharmaceutical Sciences, Chulalongkorn University, for her kind, interest, helpful advices, guidance, excellent supervision and encouragement which enable me to carry out my thesis successfully.

I wish to express my grateful thanks to Assistant Professor Dr. Vanna Tulyathan, Department of Food Technology, Faculty of Sciences, Chulalongkorn University, for her valuable advices and helpful suggestion for this research.

My sincere gratitude is extended to Assistant Professor Dr. Chairote Kunpanitchakit, Department of Mechanical Engineering, Faculty of Engineering, Chulalongkorn University, for his assistance in using the instrumented-tablet machine with excellent facilities.

My special thanks is to Unicord, Co. Ltd., for kindly supplying chitin and chitosan for this research study.

I am indebted to Professor Dr. Pieamsak Menasawate, Department of Marine Science, Faculty of Sciences, Chulalongkorn University, and Graduate School, Chulalongkorn University, for giving a financial support in this investigation.

Finally, I gratefully acknowledge to all instructors, classmates and personnels in the Department of Manufacturing Pharmacy, Faculty of Pharmaceutical Sciences, Chulalongkorn University, for their assistance.

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