

**DEVELOPMENT AND CHARACTERIZATION OF
HETEROPOLYSACCHARIDE FILM**

BY:

NURUL SYAFIQAH BINTI MD DOM

(2014664542)

Supervisor:

Dr. Nor Amlizan Ramli

Dissertation submitted to

Universiti Teknologi MARA

As partial fulfillment of the requirements to graduate with honors degrees in

BACHELOR OF PHARMACY

(2017)

ACKNOWLEDGEMENT

Bismillahirrahmanirrahim,

Alhamdulillah, all my praises to Allah the Almighty for giving me the strength and opportunity to finish my dissertation and for blessing me with a good health and peace of mind to complete this final year project.

First and foremost, I would like to express my gratitude to my supervisor, Dr Nor Amlizan Ramli for accepting me to become one of her undergraduate researchers. Besides, thanks for her patient to teach me on how to be a good researcher and on how to represent the important point during poster presentations.

Then, my second gratitude belongs to my both parents, Encik Md Dom Mat and because they are always supporting me and give me their supportive motivation that inspired me to do the project.

Then, special thanks also research assistant of Dr Nor Amlizan Ramli which is Muhamad Aidil Tumpang because he is the one that always guide me to on how to prepare the film with good structured since he also had done the study regarding to my study.

TABLE OF CONTENT

ACKNOWLEDGEMENT	ii
TABLE OF CONTENT	iv
LIST OF FIGURE	v
LIST OF TABLES	vi
LIST OF ABBREVIATION	vi
ABSTRACT	1
Chapter One – Introduction	2
1.1 Background of Study	2
1.2 Problem statement	4
1.3 Objective	5
1.4 Significance of Study	5
1.5 Hypothesis	5
Chapter Two – Literature Review	6
2.1 Skin Histology	7
2.1.1 Layer of Skin	8
2.1.2 Wound	11
2.2 Konjac Glucomannan	16
2.2.1 Physiological Properties of KGM	18
Chapter 3 – Methodology	22
3.1 Film Formulation	23
3.2 Evaluation Test	23
3.2.1 Thickness, Tensile Strength and Extensibility	23
3.2.2 Swelling Measurements	25
3.2.3 Scanning Electron Microscopy	25
Chapter 4 – Result and Discussion	26
4.1 0.5% of KGM film	27
4.2 1.0% of KGM film	28
4.3 1.0% of KGM film	29
4.4 Thickness, Tensile Strength and Extensibility	31
4.5 Swelling Measurements result	34
4.6 Scanning Electron Microscopy	35
Chapter 5 – Conclusion	38
Chapter 6 – Bibliography	39
Appendices	44

ABSTRACT

Hydrogel is group of hydrophilic polymeric material that able to renders high amount of water in their three-dimensional network (Macneil & Rimmer, 2013). After being exposed in drying oven, the hydrogel will become film since the moisture inside hydrogel had been evaporated. Based on observation, the higher concentration of the hydrogel, the more thick and rigid the film will be produced. Besides, many heteropolysaccharides had been used as medication and also as food additives such as gelling agent to make noodle and to treat wound problem (Rathinamoorthy & Sasikala, 2011). In this study, konjac glucomannan film is produced by mix the KGM powder with distilled water and mixed using magnetic stirrer, and the physical appearance of the film produced was being investigated. Texture analyzer was being used to determine the tensile strength of the film. Meanwhile, for swelling measurements that indicate amount of water absorbed, it was being done by immersed the film in phosphated buffered saline that mimic body environment pH. The result show that film that contained high amount of konjac glucomannan has higher tensile strength and also able to absorb much amount of water that mimic the exedute that being produced during inflammation process as compared to film with low concentration.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Wound is a damage or disruption to the normal anatomical structure and function of living tissue. This range from a simple break in the epithelial function of the skin or it can be deeper, continuously enlarge into subcutaneous tissues with damage to other structures such as tendon, muscles, vessels, nerves, parenchymal organs and even bone. It can be classified into three classes which are; acute wound, complicated wound and also chronic wound (Elnar & Ailey, 2009). Acute wound can be defined as injury to skin that is suddenly occurs rather than over time. The healing process occurred at predictable and estimated rate as normal wound healing process. For complicated wound, there is delay in healing and also treatment but there is no specific definition for this type of wound. Lastly, chronic wound can be defined as the type of wound that does not heal at proper stage at estimated time. If the wound does not heal within three months, it will later be classified as chronic wound. In addition, chronic wound can usually be found in diabetic patients wound (Falanga, 2005)