UNIVERSITI TEKNOLOGI MARA

WOUND HEALING POTENTIAL OF *HIBISCUS ROSA SINENSIS*-PECTIN HYDROGEL: A PRELIMINARY STUDY

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ABSTRACTS

Hibiscus rosa sinensis (HR) mucilage is a polymer with beneficial properties to facilitate wound healing: anti-inflammatory; anti-oxidant; emollient; and had been proven to increase wound contraction and tensile strength. However, intact hydrogel made up of HR mucilage solely was hard to be produced while topical application of HR mucilage gel experienced rapid clearance from wound site. Thus, this study aimed to develop a new formulation of HR mucilage combined with pectin in a hydrogel system. Then, the newly developed HR-pectin hydrogel was evaluated for its wound healing potential on partial thickness thermal burn wounds. In order to prepare HR-pectin hydrogel, mucilage from HR leaves was extracted, 0.2% w/w of it was combined with 2.5% w/w pectin, 0.8 % w/w glutaraldehyde and 0.25% w/w glycerol. Mixture was transferred into petri dishes and dried in an oven. Pectin hydrogel was prepared without the addition of HR-mucilage. Sprague dawley rats were induced with partial thickness thermal burn wound and were randomly divided into three groups: rats treated with HR-pectin hydrogel; rats treated with pectin hydrogel; and rats treated with gauze. *In vivo* wound healing activity was evaluated by inferring to macroscopic observation, wound size closure and histological profile. Uniform and transparent dry sheets of three-dimensional networks of HR-pectin hydrogel was produced. Results showed that HR-pectin hydrogel was able to promote faster wound healing when compared to pectin hydrogel or conventional gauze dressing by remarkably modulating the collagen synthesis. Therefore, further study regarding collagen synthesis modulation by HR-pectin hydrogel needs to be pursued.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

1.1.1 Pectin

The word 'pectin' represents a family of oligosaccharides and polysaccharides that have common characteristics, but are extremely different in their fine structures [1]. Pectin makes up about 33.33% of the cell wall dry substance of higher plants [2]. It is extensively used in food and pharmaceutical application due to its valuable gelling and stabilizing properties. Commercial pectins are almost exclusively derived from citrus peel or apple pomace, both by-products from juice (or cider) manufacturing [3].

1.1.2 Hibiscus Rosa-Sinensis L.

Hibiscus rosa sinensis L. (HR) that commonly known as shoe flower or Chinese hibiscus is a tropical plant that widely distributed throughout the world [4]. It is a Linnaean plant that has red double flowers and was believed to be originated from China [5]. Leaves of this plant appears in glossy dark green color with 4-6 inch width up to 8 inch long [6] and they are rich in mucilage [7].