UNIVERSITI TEKNOLOGI MARA

HISTOPATHOLOGICAL STUDY OF DIABETIC WOUND HEALING TREATED WITH GELAM HONEY

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ABSTRACT

The effects of Gelam honey on diabetic wound healing were evaluated in 24 male Sprague-Dawley rats. The rats were randomly divided into 3 groups of 2 rats each. Rats were anesthetized and full-thickness incision wounds were created. Gelam honey was applied to wound approximately 30 minutes after the incision wound was created. Wounds treated with silver sulfadiazine cream served as the positive control group while another group served as untreated control. The rats were euthanized on day 1, 5, 10 and 15 post-wounding and skin samples were taken for histopathological examination. There are several parameters in wound healing study, this study focused on measurement of collagen fibers and elastic fibers. Collagen fibers and elastic fibers measurement is essential in wound healing studies as both restores the integrity of the skin. As a result for this study, the histopathological examination showed positive progression of diabetic wound healing treated with Gelam honey throughout the post wounding days. Thus, the present study showed that topical application of Gelam honey accelerates the diabetic wound healing as compared to SSD cream and without treatment.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Diabetes mellitus is a group of metabolic disease characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action or both (Kuzuya *et al.,* 2002). Deficient action of insulin on target tissue bring to the abnormalities in carbohydrates, fat and protein metabolism (American Diabetes Association, 2014). Diabetes mellitus can lead to severe complications, mainly affect the nerves and blood vessels (Kuzuya *et al.*, 2002). One of the common complications of diabetes is delayed wound healing which may lead to chronic ulcer formation or amputation (Ponrasu & Suguna, 2012).

Delayed wound healing in diabetic patients has been attributed to decrease cell growth factor responses, diminished peripheral blood flow and decrease local angiogenesis (Brem & Tomic-Canic, 2007). Diabetes will increase free radicals *in vivo* and reduce anti-oxidation capacity (Chen *et al.*, 2012). In addition, factors that