UNIVERSITI TEKNOLOGI MARA

THE MORPHOLOGICAL STUDY OF DIABETIC WOUND HEALING TREATED WITH GELAM HONEY

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ABSTRACT

Malaysian honey particularly Gelam honey have been the subject of research due to their effectiveness to treat diabetic wounds. The present study was designed to evaluate the macroscopic and microscopic changes of diabetic wound tissue healing after treated with Gelam honey and to compare the efficacy of Gelam honey with the conventional treatment silver sulfadiazine (SSD). The efficacy of diabetic wounds treated with Gelam honey was evaluated on experimentally induced 3 cm full-thickness incision wounds in a rat model. A total of 24 Sprague-Dawley male rats weighing 160-180 g were used in this study. The wounds were treated with Gelam honey on day 1, 5, 10, and 15 post-wounding. Control animals received no treatment while SSD treated group served as positive control. The rats were inspected daily and the general appearance was recorded at day 1, 5, 10, and 15 post-wounding. Two rats from each experimental groups were euthanized at each time interval and the skin samples were taken for microscopic evaluation. Tissue sections were stained with hematoxylin and eosin (H&E) staining. The H&E stained sections were used for evaluation of regeneration of epithelial cells, infiltration of inflammatory cells, and proliferation of granulation tissues. The results of this study showed that the topical application of Gelam honey significantly enhance the wound contraction and thus accelerated wound closure demonstrated by the macroscopic evaluation. Microscopic evaluation demonstrated significant acceleration of wound healing in wounds treated with Gelam honey as compared to other groups. Therefore, the results obtained from the present study showed that Gelam honey has a positive role in accelerating the diabetic wound healing process.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Diabetes is a condition in which the blood glucose level is higher than normal (Aslam *et al.,* 2013). Diabetes mellitus is a chronic hyperglycaemic disorder which can cause significant mortality and morbidity (Komesu *et al.,* 2004). It has now reached epidemic proportions and the prevalence rates are expected to increase in future (Mafauzy, 2006). It was measured that 285 million adults worldwide had diabetes and is predicted to rise to 439 million by 2030 (Shaw *et al.,* 2010; Whiting *et al.,* 2011).

Diabetes can be categorized into type 1, type 2 and gestational diabetes (Moura *et al.,* 2013). Type 1 diabetes or also known as insulin-dependent diabetes mellitus (IDDM) is caused by pancreatic ß-cell destruction leading to insulin deficiency (Daneman, 2006). Type 2 diabetes mellitus also known as non-insulin-dependent diabetes mellitus (NIDDM) is characterized by insulin resistance (Moura *et al.,* 2013) and is associated with sedentary lifestyle and obesity (Leahy, 2005; Tuomilehto *et al.,* 2001). Gestational diabetes is