



## LOW DOSE KELULUT HONEY IMPROVES HUMAN KERATINOCYTE VIABILITY, PROLIFERATION, AND WOUND HEALING

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### ABSTRACT

**Introduction:** Wound healing is a complex and highly coordinated process comprised of 4 phases; hemostasis, inflammation, proliferation, and remodeling. Data on efficacy of honey intervention in wound healing is well established. However, reports on the beneficial effects of stingless bee honey, locally known as Kelulut honey, is scarce. In our study, we evaluated the effect of Kelulut honey (KH) on human keratinocyte wound healing. **Materials and methods:** Effect of KH on the viability and proliferation of human epidermal keratinocyte were evaluated using MTT assay. The effect of KH on the epithelialization process of human epidermal keratinocyte was evaluated using scratch assay. **Results:** The effect of KH on the viability of the epidermal keratinocyte is dose-dependent. KH at concentration of 1.56% demonstrated 50% inhibition of the keratinocyte viability. At low dose, KH at concentration of 0.0015% demonstrated higher keratinocyte viability compared to the control, although not significant. In terms of keratinocyte proliferation, the 0.0015% KH concentration shown significant improvement of keratinocyte proliferation while 1.56% concentration shown significant reduction of its proliferation. Scratch assay revealed an improvement on the wound healing rate with KH compared to the untreated control. **Discussion:** Investigating herbal cytotoxicity is very important to ensure its safety on its usage. KH demonstrated a dose-dependent cytotoxicity effect on keratinocyte. At low dose of 0.0015%, KH has been shown to improve the keratinocyte viability and proliferation. Alternatively, at concentration of 1.56%, KH starts to show cytotoxicity and negatively affect keratinocyte proliferation. With that in mind, the efficacy of KH in wound healing is evaluated using scratch assay, a well-established *in vitro* model of wound healing. KH at 0.0015% was proven to improve the wound contraction rate of keratinocyte. **Conclusion.** Stingless bee at low dose of 0.0015% improves wound healing rate in epidermal keratinocyte *in vitro* wound healing model.

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