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Abstract

Interleukin-10 is a wound healing cytokines act as anti-inflammatory and has special characteristic which is as an anti-scarring agent in regenerate wound repair. *Mikania micrantha* wound healing cream has been investigated to possess different biological reaction such as anti-inflammatory, anti-allergic, anti-diabetic, antioxidant and antimicrobial. This study aim to investigate the wound healing effect of *M.micrantha* wound healing cream by the presence of IL-10 on the wounded tissue at 4th and 8th sacrificed day. The presence and the intensity of IL-10 protein band was detected and analysed by western blot. The result showed the significant differences in the increases of IL-10 volume intensity from day 4 to day 8. The increases of IL-10 intensity indicated the *M.micrantha* had shorter period in inflammation phase. Decreases period in inflammation phase could accelerate wound healing rapidly with less scarring and suggest that this wound healing cream may serve as a novel therapeutic to treat cutaneous wounds.

Introduction

Wound healing is one of the complex physiological mechanism. Interleukin-10 have characteristics as an anti-inflammatory and immunosuppressive is serves to be one of the important growth factors in the wound healing process.

This cytokine able to re-establish the integrity of tissue in wound repair system. Besides, it also has special characteristic as an anti-scarring agent in therapeutic industry⁽¹⁾. The presence of IL-10 could increases neovascularization and promote the rapid rate of healing process.



Hence, IL-10 is necessary for scarless wound repair to occur in wound healing process⁽²⁾. *Mikania micrantha* also known as Selaput Tunggul in Malaysia is a very rapidly growing plant mainly distributed in the American tropical and temperate region. *M. micrantha* species have acknowledged can produce the important therapeutic activities when they are show variety of pharmacological reaction and have highlighted as anti-inflammatory, anti-allergic, anti-diabetic, antioxidant and antimicrobial⁽³⁾. *M. micrantha* ethanol extract (MELE) through recent studies have found this plant capable in promoting blood clot, accelerating the process in wound healing and also fight against infection⁽⁴⁾.



Objectives

General Objective: To detect the presence of Interleukin-10 on wound healing process by *Mikania micrantha*.

Specific Objectives:

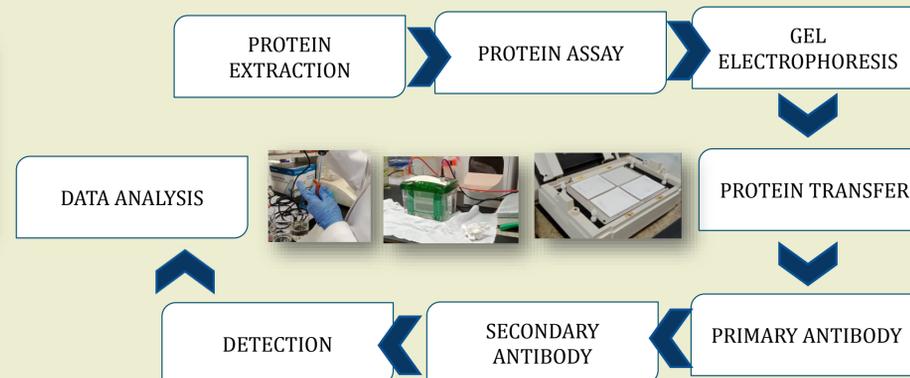
- To detect the IL-10 protein band of *Mikania micrantha* wound healing cream with control group on blotting membrane.
- To quantify the intensity of IL-10 protein band by Western blot analysis

Methodology

Data Collection of Tissue Samples

| | Day 1 | Day 2 | Day 4 | Day 8 | Day 17 |
|---------|----------|----------|----------|----------|----------|
| Group 1 | 1 tissue | | | | |
| Group 2 | 1 tissue |
| Group 3 | 1 tissue |
| Group 4 | 1 tissue |

Group 1 = Unwounded, Group 2 = Untreated, Group 3 = Mikania wound healing cream, Group 4 = Solcoseryl Jelly



Discussion

The significant differences on increases of IL-10 volume intensity at second peak of injury phase from day 4 to day 8 of sacrificed indicated the shorter period in inflammation phase. The decrease period in inflammation phase was associated with less scarring wound healing in which linked to the balance of pro-inflammatory and anti-inflammatory cytokines presences.

The significant differences on interaction between the effects of sacrificed days and treatment group on the increases of IL-10 protein intensity can be assumes that the treatment of *M. micrantha* wound healing cream is safe and as pharmacologically competent as solcoseryl jelly and can be used as treatment for cutaneous wound injuries.

Conclusion

Through this research finding, the presence of Interleukin-10 on the response of wound healing process by *M. micrantha* wound healing cream could accelerate wound healing rapidly with less scarring. This can be suggested that the *M. micrantha* wound healing cream may serve as a novel therapeutic to treat cutaneous wounds. However, repeated test for others sacrificed day is suggested and also further studies on the determination of other factors that contribute in wound healing process in order to achieve successful findings from animal models study into clinical practice.

References

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Results

(1) Detection of Interleukin-10 protein band

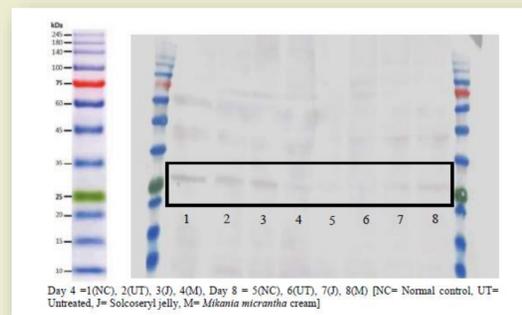


Figure 1: There were 4 group of wounded tissue consist of normal control (NC), untreated wound (UT), solcoseryl jelly treated wound (J) and *M. micrantha* cream treated wound (M) that observed at 4th and 8th of sacrificed day. The presence of Interleukin-10 protein at 27kDa as a response in wound healing process by *M. micrantha* cream followed by control cream were detected on day 4 and day 8.

(2) Quantification of Interleukin-10 protein

My Image Analysis V2.0

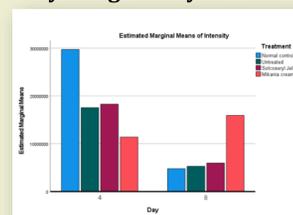


Figure 2: The differences of the IL-10 band volume intensity between the four-treatment group and two sacrificed day were shown. *M. micrantha* treated group showed the increased of the IL-10 volume intensity from day 4 to day 8.

SPSS V21

| Sources | df | F | Sig | Partial Eta Square |
|---------------|----|--------|-------|--------------------|
| Treatment | 3 | 1.802 | 0.225 | 0.403 |
| Day | 1 | 33.825 | 0.001 | 0.809 |
| Treatment*Day | 3 | 9.770 | 0.005 | 0.786 |
| Error | 8 | - | - | - |

R squared = 0.895 (Adjusted R Squared = 0.804)

Figure 3: Two-way ANOVA test showed there was a significant differences on interaction between the effects of sacrificed days and treatment group on the increases of IL-10 protein intensity P = 0.005. There was no statistically significant difference in IL-10 protein intensity between treatment group (p = 0.225), but there were statistically significant differences between 4th and 8th day of sacrificed (p < 0.001).