



รายงานฉบับสมบูรณ์

การพัฒนาผลิตภัณฑ์ต้นแบบจากตำรับสมุนไพรพื้นบ้านเพื่อรักษาแผลเบาหวานของ
หมอกิตติ นาคูณ

Development of Prototype Product from Local Herbal Recipe for
Diabetic Ulcer Treatment of Mr.Kitti Nakun

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คณะแพทย์แผนไทยและแพทย์ทางเลือก มหาวิทยาลัยราชภัฏอุบลราชธานี

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Abstract

The purpose of this study was to control the quality of the extract and to study the biological activity of the diabetic ulcer drug formulation of the folk healer Mr. Kittu Nakun, which contained 3 kinds of herbs: *Peltophorum dasyrachis* (Miq.), Kurz, *Elaeodendron glaucum* (Rottb.) Pers. and *Memecylon edule* Roxb. All three herbs were standardized in accordance with the Thai Herbal Pharmacopoeia Guideline and were examined for heavy metal contamination and chemical constituents using HPLC technique. These three herbs were then formulated and extracted with 80%, 50% ethanol, and water and then freeze-dried. The extracts were then tested for biological activity, including antioxidant activity, anti-inflammatory, antibacterial and wound healing effect. From the study of antioxidant activity by using three methods: DPPH, ABTS and FRAP, it was found that the diabetic formula extract had good antioxidant activity, especially the extract with 80% ethanol. The extract exhibited anti-inflammatory activity in macrophage cells (RAW264.) through inhibition of nitric oxide secretion. It was found that the extract with 80% ethanol was able to inhibit nitric oxide production (43.89%) which was close to the standard substance, aminoguanidine, followed by the extract with 50% ethanol and water equal to 28.78% and 12.95%, respectively. Additionally, all three extracts statistically significant suppressed inflammation through inhibition of the expression of genes involved in inflammation: cyclooxygenase-2 (COX-2), Inducible nitric oxide synthase (iNOS), Interleukin-1 (IL-1 β), IL-6 and Tumor necrosis factor (TNF- α). For antibacterial activity associated with diabetic ulcer, all extracts were found to have low inhibitory activity of microorganisms. However, they were found to be active against *Bacillus subtilis* and *Candida albicans*. From the test of the keratinocyte cells migration, it was found that the extract of 80% ethanol had high cell migration enhancement effect, followed by the water and 50% ethanol extracts. It was also found that the three extracts were able to stimulate the expression of various wound healing genes in fibroblast (HDFa) and keratinocyte (HaCaT) cells, which included procollagen (I), vascular endothelial growth factor (VEGF), matrix metalloproteinase-1 (MMP-1) and MMP-2, especially aqueous and 80% ethanol extracts revealed very good wound healing effect. All three extracts were found to have good biological activity related to diabetic ulcers. In particular, the aqueous extract and 80% ethanol were suitable for further development as a product for use in diabetic ulcers. The data from this study is very useful in the development of knowledge of folk medicine and Thai traditional medicine, resulting in the development of the herb to be a recognized product.