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Combination of bacterial cellulose wound dressing, silk sericin and polyhexamethylene biguanide for wound healing

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Wound dressing is an important factor for wound treatment. The good properties of wound dressing will lead to accelerate wound healing. Therefore, the objective of this study was to develop the bacterial cellulose wound dressing containing silk sericin and polyhexamethylene biguanide (PHMB) for wound treatment. Coconut is one of the value products of Thailand's industrial harvests. Unfortunately, ripe coconut water is usually a waste product from coconut milk production that is discarded into the environment and results in pollution. Bacterial cellulose is produced by *Acetobacter xylinum* which is fermented in ripe coconut water. It has many advantages for wound healing: transparency, autolytic debridement, acceleration of re-epithelialization and fewer daily wound dressing changes. Because of the many benefits of bacterial cellulose, it is used in many applications including cosmetics and medical devices such as wound treatment dressing material. Silk sericin is a protein from silk cocoons which can accelerate the proliferation of fibroblast cells and activate collagen synthesis for wound healing. PHMB is a broad-spectrum antimicrobial agent with high efficacy and low toxicity. Accordingly, the combination of bacterial cellulose wound dressing containing silk sericin and PHMB will have many benefits to the wound. The safety and efficacy of the dressings, *in vitro* and *in vivo* was investigated. The results showed the dressing has good physical, mechanical and biological properties. The wound size of wounds treated with the dressing showed a significantly less than control. No inflammation or irritation was shown in rats. Moreover, in the clinical study, the dressing also showed many benefits for split-thickness skin graft wound treatment without any toxicity.

Biography

Supamas Napavichayanun is a PhD student, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand. She has obtained BSc from Faculty of Pharmaceutical sciences, Chulalongkorn University. Her research experience ranged from protein including silk proteins and biomaterials. She also did clinical researches in the area of dermatology especially materials for wound healing application.

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