

ABSTRACT

Diabetic foot ulcers are the most common complications in persons with poorly controlled diabetes (DM). This syndrome can be caused by inadequate glycemic control, underlying neuropathy, a slow and progressive circulation disorder (PVD), or terrible foot care. Around the world, 9.1 to 26.1 million suffer from diabetic foot ulcers. Usually, people at any age are commonly suffering from diabetes mellitus (DM). There is also a condition that could develop into diabetes called prediabetes which is as risky as the diabetic condition itself if the patients' lifestyle wasn't improved. Looking at the epidemiology, a good and adequate wound dressing should be well made as wound dressings serve as a barrier to protect wounds and encourage healing. Hence, in this experiment, the matrix of biocellulose (BC) and tamanu oil as dressing are investigated to promote wound healing in diabetic-induced mice. Biocellulose is a kind of cellulose generated by bacteria. This nanostructured cellulose offers excellent biocompatibility and biodegradability, as well as superior physicochemical and mechanical characteristics, it also has higher purity, as well as easier extraction. Like any other material, BC also has its drawbacks, one of them is that BC lacks antibacterial properties, hence Tamanu Oil will come in place. Tamanu Oil has the ability as an antibacterial agent and increases the regeneration of fibroblast and keratinocytes. Results obtained from this experiment showed that the fabrication of BC was a success while a significant wound closure can be seen in the BC-green tamanu oil treatment group, observed macroscopically. While green tamanu exhibits antimicrobial properties towards *S.aureus* strain, the histology observation indicates that the green tamanu oil failed to accelerate the healing process of the chronic wound (foot ulcers) caused by diabetes.

Keywords: *Diabetes, Prediabetic condition, Biocellulose (BC), Calophyllum inophyllum L., Tamanu oil, Matrix, Wound healing, Antibacterial properties, Komagataeibacter intermedius.*