

Abstract

Diabetes is one of the most lethal and ninth most common diseases in the world, which is a metabolic disorder that causes a high and unusual blood sugar level due to the inability of the body to utilize sugar. Diabetes can cause multiple complications and damage to the system, one of them is diabetic foot ulcers (DFU). The most advanced treatment nowadays for DFU is by utilizing bio-cellulose, a biopolymer made from bacteria. Bio-cellulose is used as it can protect wounds from outside environments, such as debris and microorganisms which might increase the severity of the wound. In this project, bio-cellulose is infused with green tamanu oil (GT), an oil originating from the Tamanu tree (*Calophyllum inophyllum L.*). GT consists of CP which might contribute greatly to wound healing progress. Therefore, this study aims to measure BC's wound reduction, histology observation, and antibacterial properties with GT. Results showed that wounds given BC GT managed to improve wound reduction in diabetic mice and rabbits. Histology observation between both animal models also showed a faster wound healing progression with the majority of the wound healing treated in the proliferative stage. Antimicrobial data were found to be varied, however, when gram staining was performed, no gram-positive bacteria were observed on the BC GT wound. Moreover, some optimization must be done in future studies as the diabetic rabbit animal model failed to induce, where future research is also needed to observe the strains present during the wound healing process.

Keywords: *Diabetes, Wound healing, Green Calophyllum inophyllum L., Biocellulose (BC), Antimicrobial properties*