

ABSTRACT

Diabetes is a major epidemic in nearly all regions of the world. Roughly 15% of diabetic patients will develop chronic wounds and eventually diabetic foot ulcers in their lifetime. These chronic wounds exhibit delayed wound closure and may become fatal if left untreated. One of the promising treatments and management for diabetic foot ulcers is applying appropriate dressing materials. Hydrogels are among the best candidates because they can maintain a moist environment ideal for tissue regeneration and growth. This study uses keratin, bacterial cellulose, and tamanu oils as the potential novel matrix for chronic wound healing. Keratin is extracted from human hair using the Shindai method, while bacterial cellulose is made from *Komagataeibacter intermedius* isolated from kombucha drinks. Black tamanu oil was obtained commercially and applied to the wounds to suppress the microbial growth on the wound site. Mice were first introduced to streptozotocin to induce diabetes for ten days, and the dorsal subcutaneous model was made by piercing the skin with a biopsy punch. Results show that the matrix KBC improves tissue regeneration while adding tamanu oil to the matrix significantly improves tissue regeneration and remodeling.

Keywords: in vivo study; wound healing; diabetic ulcer; bacterial cellulose; *Calophyllum inophyllum* oil