

ABSTRACT

A wound brought on by trauma, periodontal disease, tooth extraction, and other oral surgical operations is known as gingival inflammation. In order to preserve homeostasis and repair the integrity of damaged tissue, the gingival wound healing process is crucial. The membrane is a porous, biocompatible, biodegradable substance that serves as both an extracellular matrix and a structural support for cells during the process of natural tissue growth and regeneration. In this work, collagen-chitosan composites for gingival membranes were synthesised using different plasticisers. Each of these products has unique benefits and, when combined, will promote wound healing. These compounds are employed because of their ability to help mend receding gums. The freeze-dry procedure, which can create pores in the membrane, is used in the manufacture of collagen-chitosan-glycerol membranes. Additionally, FTIR, morphological, tensile, and swelling characterisation were performed on the outcomes of the synthesis of collagen-chitosan membranes with the addition of glycerol. The FTIR characterisation results demonstrated that the collagen-chitosan system's chemical and physical properties were impacted by the addition of glycerol. Elongation values of 1.33% (control), 83.6% (glycerol 2 ml), 43% (glycerol 4 ml), and 71.6% (glycerol 6 ml) were obtained from the tensile test results of chitosan-collagen + glycerol variants. The chitosan-collagen + glycerol 2 ml tensile test result showed the maximum elongation value of 83.6%. The swelling ratios were 192% (control), 198% (glycerol 2 ml), 55% (glycerol 4 ml), and 179% (glycerol 6 ml), according to the swelling data. Glycerol 2 ml produced the best swelling ratio outcome in this investigation, with a 198% swelling ratio. A variation of chitosan-collagen + glycerol 2 ml was revealed by the findings of morphological characterisation (SEM). According to FTIR characterisation, mechanical strength (tensile strength), degree of swelling, and SEM characterisation, collagen-chitosan membrane with added glycerol has good promise as a membrane option for gingival recession therapy.

Keywords: Gingival, glycerol, chitosan, collagen, membrane.