

INTISARI

Lidah buaya (*Aloe Vera*) merupakan polimer alam yang mudah didapatkan dan banyak dikembangkan di era modern ini, di mana *Aloe Vera* tersebut memiliki banyak manfaat terutama di bidang biomedis. Salah satunya diaplikasikan sebagai membran pembalut luka (*wound dressing*). Penelitian ini bertujuan untuk memfabrikasi membran nanofiber *PVA/Aloe Vera* alami menggunakan metode elektrospinning dengan mengkarakterisasi morfologi serta sifat tariknya.

Fabrikasi membran nanofiber berbahan polimer *Aloe Vera* alami *blend* polivinil alkohol (PVA) terlebih dahulu dilakukan dengan menghaluskan gel *Aloe Vera* alami yang selanjutnya dilakukan proses penyaringan. Larutan *spinning* dibuat menggunakan metode *blending* dengan perbandingan (aquades 10 (g) : PVA 1 (g) : konsentrasi *Aloe Vera* alami 0, 10, 20 dan 30%) w/w. Pembuatan membran nanofiber dengan metode elektrospinning pada tegangan 15 kV, jarak jarum ke kolektor (TCD) 16 cm, dan diameter jarum 0,7 mm. Karakterisasi sifat fisis membran serat nanofiber dilakukan menggunakan *scanning electron microscope* (SEM) sedangkan sifat mekanik (uji tarik) diuji menggunakan mesin uji tarik *universal testing machine* (Zwick 0.5 jerman, ASTM D 882).

Hasil analisis sifat fisis membran nanofiber menggunakan SEM menunjukkan bahwa semakin banyak konsentrasi PVA/AV akan meningkatkan ukuran diameter serat nano, pada konsentrasi 0% diameter serat 136 nm sedangkan pada konsentrasi 30% menjadi 223 nm. Selanjutnya, hasil analisis pengujian sifat mekanik membran nanofiber menunjukkan bahwa dengan bertambahnya konsentrasi *Aloe Vera* alami mampu menaikkan nilai kuat tarik (2,598-3,585 MPa), regangan (105,864-158,204 %) dan modulus elastisitas (16,305-17,721 MPa). Hasil dari penelitian ini berpotensi digunakan sebagai bahan pembalut luka (*wound dressing*).

Kata Kunci : Lidah buaya, elektrospinning, nanofiber, sifat tarik, SEM

ABSTRACT

Aloe Vera is a natural polymer that is easily available and is widely developed in this modern era, Aloe Vera has many benefits, especially in the biomedical field. One of them was applied as a wound dressing membrane. This study aims to fabricate natural PVA/Aloe Vera nanofiber membranes using electrospinning method by characterizing morphology and its tensile properties.

Fabrication of natural nanofiber membranes made from Aloe Vera polymer polyvinyl alcohol (PVA) blend is done first by smoothing the natural Aloe Vera gel which is then carried out the screening process. Spinning solution is made using a blending method with a ratio (10 distilled water (g): PVA 1 (g): natural concentration of Aloe Vera 0, 10, 20 and 30%) w/w. Making nanofiber membrane with electrospinning method at a voltage of 15 kV, tip distance to collector (TCD) 16 cm, and needle diameter 0.7 mm. Characterization of the physical properties of nanofiber fiber membranes was carried out using a scanning electron microscope (SEM) while the mechanical properties (tensile test) were tested using universal testing machine tensile testing machine (Zwick 0.5 Germany, ASTM D 882).

The results of the analysis of the physical properties of nanofiber membranes using SEM showed that more PVA / AV concentrations would increase the diameter size of nanofiber, at a concentration of 0% 136 nm fiber diameter while at a concentration of 30% to 223 nm. Furthermore, the results of the analysis of the mechanical properties of nanofiber membranes showed that with the increasing concentration of natural Aloe Vera it was able to increase the value of tensile strength (2,598-3,585 MPa), strain (105,864-158,204%) and modulus of elasticity (16,305-17,721 MPa). The results of this study have the potential to be used as wound dressing.

Keywords: Aloe vera, electrospinning, nanofiber, tensile properties, SEM