

Pengaruh Pemberian Sediaan Biomaterial Selulosa Bakteri *Acetobacter xylinum* dari Limbah Ketela Rambut (*Ipomoea batatas* Poir) dengan Penambahan *Chitosan* sebagai Material Penutup Luka pada Tikus Galur Wistar Jantan

INTISARI

Penelitian dilakukan untuk mempelajari karakter biomaterial yang dihasilkan dari pemanfaatan limbah cair ketela rambut yang diperoleh dari proses pembuatan tepung pati dari ketela rambut yang ditambah gliserol dan *chitosan* serta aktivitas penyembuhan luka jika diaplikasikan sebagai material penutup luka pada tikus jantan galur Wistar.

Biomaterial terbuat dari selulosa bakteri sebagai kontrol karakterisasi, selulosa bakteri+gliserol dan selulosa bakteri+gliserol+*chitosan* sebagai perlakuan. Karakterisasi meliputi analisis sifat fisik, gugus fungsional dengan instrumen spektrofotometer infra merah, morfologi permukaan dengan instrumen SEM, sifat mekanik dengan instrument Universal Tester, kristalinitas dengan instrumen XRD dan kestabilan termal dengan instrumen TGA/DTA *Analyzer*. Uji penyembuhan luka dilakukan dengan melukai hewan uji lalu luka ditutup dengan membran *chitosan*, selulosa yang ditambah gliserol dan *chitosan* serta tanpa ditutup lalu didiamkan selama 3, 5 dan 7 hari. Sehari setelah luka dibuat, diameter luka diukur dengan jangka sorong. Pada hari yang ditentukan, hewan uji dikorbankan dan diukur kembali diameter lukanya lalu diubah menjadi persentase penurunan luas luka dan dilihat patologi anatomi lukanya secara makroskopis.

Karakteristik biomaterial yang dihasilkan meliputi peningkatan intensitas gugus fungsi dan kestabilan termal, perubahan struktur morfologi, penurunan sifat mekanik dan persen kristalinitas serta perubahan sifat fisik akibat penambahan *chitosan*. Pemberian gliserol meningkatkan intensitas gugus fungsi, persen perpanjangan dan kestabilan termal, menurunkan kuat tarik serta tidak mempengaruhi sifat fisik, persen kristalinitas, dan struktur morfologi. Pemberian penutup luka dari biomaterial selulosa bakteri+gliserol+*chitosan* tidak berpengaruh terhadap proses penyembuhan luka.

Kata Kunci: biomaterial, *chitosan*, limbah ketela rambut, penutup luka

Effect Bacterial Cellulose *Acetobacter xylinum* toward Biomaterial Preparation from Sweet Potato Waste (*Ipomoea batatas* Poir) with Addition of Chitosan as Wound Dressing in Male Rats

ABSTRACT

The objective of this research was to study the character of biomaterials from the utilization of wastewater derived from sweet potato starch manufacturing process of the sweet potatoes and was added with glycerol and chitosan as well as the healing activity of biomaterials when applied as wound dressing material in Wistar male rats.

Biomaterials is made from bacterial cellulose as a control characterization, bacterial cellulose+glycerol and bacterial cellulose+glycerol+chitosan as a treatment. Characterization included analysis of physical properties, functional groups with an infrared spectrophotometer instrument, morphology surface with SEM instrument, the mechanical properties with Universal Tester instrument, crystallinity with XRD instrument and the thermal stability with TGA / DTA Analyzer. Wound healing assay performed with the wounding of test animals with specific diameter and wounds covered with chitosan membranes, biomaterials cellulose+glycerol+chitosan then allowed to stand uncovered for 3, 5 and 7 days. A day after the wound was made, the wound diameter was measured with calipers. On the appointed day, the test animals were sacrificed and the wound diameter was measured again then converted into a percentage reduction in injuries and extensive views of anatomic pathology macroscopic wound.

The resulting biomaterial characteristics include increased intensity of the functional groups and thermal stability, structural changing of in the morphology, decreasing mechanical properties and percent crystallinity as well as changing in physical properties due to the addition of chitosan. Adding glycerol can increasing the intensity of functional groups, percent elongation and thermal stability but decrease tensile strength and did not affect the physical properties, percent crystallinity, and morphology structure. Giving of wound dressing biomaterials from bacterial cellulose+glycerol+chitosan did not affect the wound healing process.

Keywords: biomaterials, chitosan, sweet potatoes waste, wound dressing