ABSTRAK

Limbah cangkang kepiting rajungan (*Portunus pelagicus*)merupakan salah satu sumber polimer kitosan (*β-(1-4) linked 2-amino-2-deoxy-β-D-glucopyranose*). Kitosan, polisakarida hasil deasetilasi kitin, dapat digunakan sebagai biomaterial pada biokomposit untuk restorasi tulang. Ekstraksi kitosan limbah cangkang kepiting dapat dilakukan dengan ekstraksi kimia yang meliputi; deproteinasi, demineralisasi, depigmentasi, dan deasetilasi. Biokomposit-*scaffold* difabrikasi dengan mengkombinasi hidroksiapatit dan kolagen yang kemudian dicetak melalui proses *freeze-drying*. Karakteristik serbuk kitosan dan biokomposit-*scaffold* dilakukan dengan menganalisis gugus fungsi melalui *Fourier Transform Infrared Spectrophotometer* (FTIR) dan dilakukan pengujian morfologi pori, *porosity*, *swelling, degradation,* dan *compression strength* untuk menunjukan kualitas dari biokomposit-*scaffold* kitosan-HAp-kolagen dalam restorasi tulang. Rendemen kitosan yang diperoleh sebesar 9,95 ± 0,919%. Fabrikasi *scaffold* memberikan struktur yang berpori dengan nilai *porosity* sebesar 61,052 ± 1,060% dengan ukuran pori pada *inner* 156,297 ± 52,546 µm, dan *surface* sebesar dan 58,014 ± 6,749 µm. Persentase *swelling* selama 24 jam sebesar 310,0275 ± 21,972%, persentase *degradation* selama 4 minggu 29,127 ± 9,878%, dan memiliki kekuatan mekanik sebesar 0,968 ± 0,008 MPa.

Kata Kunci: biokomposit; kitosan; kepiting; rajungan; scaffold.

ABSTRACT

The blue swimming crab shell (*Portunus pelagicus*) is a source of chitosan polymer (β-(1-4) linked 2-amino-2-deoxy-β-D-glucopyranose). Chitosan, a polysaccharide resulting from the deacetylation of chitin, is a biomaterial biocomposites for bone recovery. Deacetylation, demineralization, and deproteinization to extract and isolate chitosan from the crab shell. This study combined collagen-hydroxyapatite-chitosan to fabricate biocomposite scaffold, then subsequently molded using a freeze-drying procedure. This study employed a Fourier Transform Infrared Spectrophotometer (FTIR) to confirm scaffold fabrication. In addition, we observed morphology, porosity, swelling, degradation, and compression strength was carried out. The yield of chitosan was 9.95 ± 0.919% w/w. Scaffold a porous structure with a porosity value of 61.052 ± 1.060 %, an inner pore size of 156.297 ± 52.546 µm, and a surface of 58.014 ± 6.749 µm. The swelling percentage for 24 hours was 310.0275 ± 21.972%, the degradation percentage for 4 weeks was 29.127 ± 9.878%, and the mechanical strength was 0.968 ± 0.008 MPa.

Keywords: biocomposite; chitosan; crab; blue swimming crab shell; scaffold.