Karakterisasi gugus fungsi dan uji kompresi Scaffold Hidroksiapatit-Gelatin-Propolis sebagai biomaterial bone tissue engineering = Characterization of functional group and compression test Hydroxyapatite-Gelatin-Propolis Scaffold as biomaterial for bone tissue engineering

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Abstrak

Latar Belakang: Pada jaringan yang terkena kerusakan maupun degenerasi sangat dibutuhkan perawatan untuk menggantikan jaringan baru. Dalam merancang material untuk rekayasa jaringan, dibutuhkan material yang memiliki sifat mekanis yang tahan pada lingkungan in vivo. Hidroksiapatit banyak digunakan sebagai bahan rekayasa jaringan karena bersifat bioaktif. Propolis memiliki kandungan Caffeic Acid Phenethyl Esters (CAPE) yang dapat menstimulasikan pertumbuhan jaringan. Tujuan: Mengevaluasi karakterisasi gugus fungsi dan kuat tekan scaffold hidroksiapatit-gelatin-propolis yang dibuat melalui metode freeze-dry dari larutan hidroksiapatit-gelatin dengan tambahan propolis 4, 6, dan 10% Metode: Scaffold Hidroksiapatit-Gelatin-Propolis dengan konsentrasi kandungan propolis 4%, 6%, dan 10% yang telah dihasilkan kemudian diuji menggunakan Universal Testing Machine Shimadzu AGS-5kNX untuk mengetahui kuat tekannya. Selanjutnya, Scaffold Hidroksiapatit-Gelatin-Propolis dikarakterisasi dengan Fourier Transform Infra-Red (FTIR) dan dilihat gugus fungsi yang terdapat didalamnya. Hasil: Karakterisasi FTIR menunjukkan puncak serapan ion fosfat yang rendah pada kelompok sampel Scaffold Hidroksiapatit- Gelatin-Propolis dan kelompok kontrol. Kelompok sampel Scaffold Hidroksiapatit-Gelatin- Propolis memiliki kuat tekan yang lebih rendah dibanding kelompok kontrol. Kesimpulan: Hidroksiapatit tidak terbentuk pada kelompok kontrol dan kelompok Scaffold Hidroksiapatit- Gelatin-Propolis. Semakin tinggi kandungan propolis dalam Scaffold Hidroksiapatit-Gelatin- Propolis, semakin rendah kuat tekannya.

.....Background: When tissue get damaged or degenerated, to replace it, new tissue treatment is needed. In designing materials for tissue engineering, materials that have mechanical properties that are resistant to in vivo are needed. Hydroxyapatite is widely used as a tissue engineering material because it is bioactive. Propolis contains Caffeic Acid Phenethyl Esters (CAPE) which can stimulate tissue growth. Purpose: To evaluate characterization of functional group and compressive strength Hydroxyapatite-Gelatin-Propolis Scaffold that is made by freeze-drying method from hydroxyapatite-gelatin solution with addition of 4, 6, 10% propolis. Methods: Hydroxyapatite-Gelatin-Propolis Scaffold with 4%, 6%, and 10% propolis concentration that has been generated were tested using Universal Testing Machine Shimadzu AGS-5kNX to find out the compression strength. Furthermore, Hydroxyapatite- Gelatin-Propolis Scaffold were characterized using Fourier Transform Infra-Red (FTIR) and the functional groups were observed. Result: FTIR Characterization showed low intensity of phosphate ion absorption peak in Hydroxyapatite-Gelatin-Propolis Scaffold specimens and control specimen. Hydroxyapatite-Gelatin-Propolis Scaffold specimens had lower compressive strength than control specimens. Conclusion: Hydroxyapatite was not formed in control specimens and Hydroxyapatite-Gelatin-Propolis Scaffold specimens. The higher the propolis content in the Hydroxyapatite-Gelatin-Propolis Scaffold, the lower the compressive strength.