

**PENGARUH PENAMBAHAN NANOFIBER SISAL (*Agave sisalana*)
KONSENTRASI 0,5% DAN 0,75% PADA SILER RESIN EPOKSI
TERHADAP KELARUTAN SILER**

INTISARI

Siler saluran akar harus memiliki sifat tidak mudah larut supaya tidak mudah menyebabkan celah yang menyediakan jalan bagi mikroorganisme beserta produknya ke jaringan periapikal. Penambahan bahan pengisi pada siler berbahan dasar resin epoksi dapat meningkatkan sifat fisik dan mekanik siler. Serat sisal (*Agave sisalana*), berasal dari Meksiko Selatan, merupakan serat alam yang sedang dikembangkan dan dapat menjadi bahan pengisi pada siler saluran akar. Tujuan penelitian ini adalah untuk mengetahui pengaruh penambahan *nanofiber* sisal dengan konsentrasi 0,5% dan 0,75% pada siler berbahan dasar resin epoksi terhadap kelarutan siler.

Uji kelarutan siler dilakukan sesuai dengan standar ISO 6876. *Nanofiber* sisal ditambahkan ke siler resin epoksi pada 3 kelompok dengan masing-masing konsentrasi berdasarkan persentase berat sebesar 0%, 0,5%, dan 0,75%. Sampel dibuat menggunakan cetakan berbentuk cincin baja tahan karat dengan diameter 20 mm dan tinggi 1,5 mm. Uji kelarutan dilakukan dengan menghitung persentase selisih berat sebelum dan sesudah perendaman sampel dalam larutan SBF selama 24 jam di dalam inkubator 37°C, kelembapan relatif 95%. Hasil uji kelarutan dianalisis menggunakan ANAVA satu jalur dan uji *Post Hoc* metode *Tukey*.

Uji ANAVA satu jalur menunjukkan terdapat perbedaan kelarutan yang signifikan ($p < 0,001$) antara siler resin epoksi tanpa *nanofiber* sisal dengan siler resin epoksi yang diberi *nanofiber* sisal. Kesimpulan penelitian ini adalah terdapat pengaruh penambahan *nanofiber* sisal berbagai konsentrasi pada siler resin epoksi terhadap kelarutan siler. Kelarutan paling rendah terdapat pada kelompok dengan *nanofiber* sisal 0,75% diikuti dengan kelompok konsentrasi 0,5%.

Kata kunci: *nanofiber* sisal, siler resin epoksi, kelarutan siler

THE EFFECT OF SISAL NANOFIBER (*Agave sisalana*) CONCENTRATION OF 0,5% AND 0,75% IN EPOXY RESIN-BASED SEALER ON SEALER SOLUBILITY

ABSTRACT

The root canal sealer must have insoluble properties so that it does not easily create gaps that provide a pathway for microorganisms and their products to the periapical tissue. Adding filler to epoxy resin-based sealer could improve the physical and mechanical properties of the root canal sealer. Sisal (*Agave sisalana*) fiber, originally from South Mexico, is a natural fiber that is currently being developed as a filler in root canal sealers. The purpose of this study was to determine the effect of adding sisal nanofiber with various concentrations, which are 0,5% and 0,75% as a filler in epoxy resin-based sealer on the sealer solubility.

Solubility test was carried out according to ISO 6876. The nanofiber sisal was mixed with epoxy resin based sealer in three groups with each concentration 0%, 0.5%, and 0.75% based on weight percentage. The samples, were made using stainless steel ring-shaped mold with a diameter of 20 mm and a height of 1,5 mm. Solubility test was carried out by calculating the percentage of weight difference before and after immersing the sample in SBF solution for 24 hours in an incubator at 37°C with 95% relative humidity. The result of solubility test was analyzed using one-way ANOVA and Post Hoc Test Tukey.

One-way ANOVA test showed that there was a significant difference ($p < 0,001$) in solubility between epoxy resin-based sealer without the addition of nanofiber sisal and epoxy resin based-sealer with the addition of nanofiber sisal. The conclusion of this study was that there is an effect of adding sisal nanofiber of various concentrations to the epoxy resin-based sealer on the sealer solubility. The lowest solubility was found in the group with 0,75% sisal nanofiber followed by the 0,5% concentration group.

Keywords: sisal nanofiber, epoxy resin-based sealer, sealer solubility