PENGARUH PENAMBAHAN SISAL NANOFIBER BERBAGAI KONSENTRASI PADA SILER RESIN EPOKSI TERHADAP KEKERASAN MIKRO
Kajian *in vitro*

INTISARI

Saat ini banyak penelitian yang berupaya untuk meningkatkan kualitas siler resing epoksi dengan menambahkan berbagai material sebagai bahan pengisi (*filler*) agar mendapatkan siler yang ideal. Sisal nanofiber (*Agave sisalana*) saat ini dikembangkan sebagai bahan pengisi dapat mempengaruhi sifat fisik siler, seperti kekerasan mikro. Tujuan penelitian ini adalah untuk mengetahui pengaruh penambahan sisal nanofiber dengan konsentrasi 0,25%, 0,5%, 0,75% dan 1% terhadap kekerasan mikro siler resin epoksi.

Pada penelitian ini menggunakan siler resin epoksi yang dibagi menjadi 5 kelompok (n=5) dengan total 25 sampel. Kelompok I merupakan siler resin epoksi tanpa penambahan sisal nanofiber sebagai kelompok kontrol. Kelompok II-V merupakan siler resin epoksi dengan penambahan sisal nanofiber 0,25%, 0,5%, 0,75% dan 1%. Sampel dibuat menggunakan cetakkan logam yang menghasilkan cetakkan berbentuk silinder berketebalan 2 mm dan diameter 10 mm. Sampel disimpan dalam kontainer plastik dengan kelembaban 100% dan dimasukkan ke inkubator dengan suhu 37ºC selama 7X24 jam. Dilakukan uji kekerasan mikro menggunakan *Vickers microhardness tester* dengan beban 200 gram dalam waktu 10 detik. Kekerasan mikro kemudian dianalisis dengan uji ANAVA satu jalur dan LSD dengan signifikansi 95%.

Rerata hasil uji kekerasan mikro kelompok I-V yaitu 16,60HV, 19,18HV, 19,64HV, 19,90HV dan 20,50HV. Hasil analisis statistik menunjukkan ada perbedaan kekerasan mikro yang signifikan antara siler resin epoksi yang tidak ditambahkan sisal nanofiber dengan siler resin epoksi dengan penambahan sisal nanofiber, tetapi penambahan konsentrasi sisal nanofiber 0,25%, 0,5%, 0,75% dan 1% tidak berpengaruh signifikan terhadap kenaikkan nilai kekerasan mikro siler resin epoksi. Kesimpulan dari penelitian ini adalah penambahan sisal nanofiber dengan konsentrasi 0,25%, 0,5%, 0,75% dan 1% mempunyai kekerasan mikro yang lebih tinggi dibandingkan dengan siler resin epoksi tanpa penambahan sisal nanofiber. Penambahan konsentrasi 0,25%, 0,5%, 0,75% dan 1% pada siler resin epoksi mempunyai kekerasan mikro yang sama.

Kata kunci : sisal nanofiber, siler resin epoksi, kekerasan mikro

THE EFFECT OF ADDITION OF SISAL NANOFIBER VARIOUS CONCENTRATIONS ON THE MICROHARDNESS EPOXY RESIN SEALER
An in vitro study

ABSTRACT

Currently, many studies are trying to improve the quality of epoxy resin sealers by adding various materials as fillers in order to get the ideal sealer. Sisal nanofiber (*Agave sisalana*) is currently being developed as a filler that can affect the physical properties of the sealer, such as microhardness. The purpose of this study was to determine the effect of adding sisal nanofiber with concentrations of 0.25%, 0.5%, 0.75% and 1% on the microhardness of the epoxy resin sealer.

In this study, epoxy resin sealers were divided into 5 groups (n=5) with a total of 25 samples. Group I is epoxy resin sealer without the addition of sisal nanofiber as a control group. Groups II-V are epoxy resin sealers with the addition of 0.25%, 0.5%, 0.75% and 1% sisal nanofiber. The sample was made using a metal mold which produced a cylindrical mold with a thickness of 2 mm and a diameter of 10 mm. Samples were stored in plastic containers with 100% humidity and put in an incubator at 37ºC for 7X24 hours. Microhardness test was carried out using a Vickers microhardness tester with a load of 200 gram in 10 seconds. The microhardness was then analyzed using one-way ANOVA and LSD with 95% significance.

The average results of the microhardness test in groups I-V were 16.60HV, 19.18HV, 19.64HV, 19.90HV, 20.50HV. Statistical analysis results showed that there was a significant difference in microhardness between the epoxy resin sealer without the addition of nanofiber sisal and the epoxy resin sealer with the addition of nanofiber sisal but the addition of the nanofiber sisal concentration of 0.25%, 0.5%, 0.75% and 1% did not. significant effect on the increase in the microhardness value of the epoxy resin sealer. The conclusion of this study is that the addition of sisal nanofiber with concentrations of 0.25%, 0.5%, 0.75% and 1% has a higher microhardness than the epoxy resin without the addition of sisal nanofiber. The addition of sisal nanofiber with concentrations of 0.25%, 0.5%, 0.75% and 1% on the epoxy resin had the same microhardness.

Keywords: sisal nanofiber, epoxy resin sealer, microhardness