INTISARI

Semen ionomer kaca (SIK) adalah bahan restorasi kedokteran gigi yang sering digunakan karena antikariogenik dan biokompatibel. Bahan *reinforcement* ditambahkan untuk meningkatkan kekuatan tarik SIK. Salah satu *reinforcement* alami yaitu serat sisal (*Agave sisalana*). *Coupling agent silane* digunakan untuk meningkatkan adesi serat dan SIK. Tujuan dari penelitian ini untuk mengetahui kadar optimal penambahan sisal mikro tersilanisasi terhadap kekuatan tarik semen ionomer kaca.

Penelitian menggunakan serat sisal (Balittas, Indonesia) dan SIK (Fuji II GC, Jepang). Pembuatan sisal mikro meliputi *scouring*, netralisasi, *bleaching*, hidrolisis, dan pengeringan. Pengujian ukuran sisal mikro dilakukan menggunakan *scanning electron microscope* (SEM). Sampel penelitian berjumlah 4 kelompok (n=4). Kadar sisal mikro pada SIK (b/b) yaitu 0% (K), 1% (P1%), 3% (P3%), dan 5% (P5%). Serbuk dan cairan diaduk, dimasukkan kedalam cetakan berbentuk *dumbell* berukuran 30 mm x 4 mm x 2 mm dan dibiarkan mengeras pada suhu ruang. Kekuatan tarik SIK diuji menggunakan *universal testing machine*. Data dianalisis menggunakan uji *one-way ANOVA* dan *post hoc LSD*.

Hasil penelitian berupa rerata dan simpangan baku kekuatan tarik SIK yaitu 5,63 ± 1,04 MPa (K), 10,63 ± 1,33 MPa (P1%), 13,13 ± 1,04 MPa (P3%), dan 12,50 ± 0,88 MPa (P5%). Hasil uji *one-way ANOVA* menunjukkan variasi kadar penambahan sisal mikro tersilanisasi berpengaruh meningkatkan kekuatan tarik semen ionomer kaca ($p<0,05$). Kesimpulan penelitian ini adalah kadar optimal penambahan sisal mikro tersilanisasi terhadap kekuatan tarik semen ionomer kaca konvensional adalah 1% b/b.

Kata kunci: Semen ionomer kaca, *Agave sisalana*, silan, kekuatan tarik

ABSTRACT

Glass ionomer cement (GIC) is a dental restorative material that is often used because it is anticariogenic and biocompatible. Reinforcement is added to increase the tensile strength of GIC. One of the natural reinforcement is sisal fiber (*Agave sisalana*). Silane coupling agent is used to improve fiber adhesion and GIC. The purpose of this study is to determine the optimum level of addition of silanized micro sisal to the tensile strength of GIC.

This research uses sisal fiber (Balittas, Indonesia) and Fuji II GIC (GC, Japan). Micro sisal manufacturing includes scouring, neutralization, bleaching, hydrolysis, and drying. Micro sisal size testing was carried out using a scanning electron microscope (SEM). The research sample consisted of 4 groups (n = 4). The levels of micro sisal in GIC (w / w) were 0% (K), 1% (P1%), 3% (P3%), and 5% (P5%). The powder and liquid were stirred, put into a dumbbell-shaped mold measuring 30 mm x 4 mm x 2 mm and allowed to harden at room temperature. The tensile strength of GIS was tested using a universal testing machine. Data were analyzed using one-way ANOVA and post hoc LSD tests.

The results of the study were the mean and standard deviation of GIC tensile strength, namely 5,63 ± 1,04 MPa (K), 10,63 ± 1,33 MPa (P1%), 13,13 ± 1,04 MPa (P3%), and 12,50 ± 0.88 MPa (P5%). The results of the one-way ANOVA test showed that the variation in the levels of addition of silted micro sisal had an effect on increasing the tensile strength of glass ionomer cement ($p<0,05$). The conclusion of this study is that the optimal level of addition of silted micro sisal to the tensile strength of conventional glass ionomer cement is 1% b/b/.

Keywords: Glass ionomer cement, *Agave sisalana*, silane, tensile strength