

INTISARI

Semen ionomer kaca (SIK) merupakan salah satu bahan restorasi kedokteran gigi yang sering digunakan karena memiliki biokompatibilitas yang baik. Kekurangan dari SIK yaitu sifat mekanis yang kurang baik. Penambahan bahan *reinforcement* dapat meningkatkan sifat mekanis SIK. Salah satu *reinforcement* alami yaitu serat sisal (*Agave sisalana*). *Coupling agent silane* ditambahkan untuk meningkatkan adhesi antara SIK dan bahan *reinforcement*. Tujuan dari penelitian ini untuk mengetahui kadar optimum penambahan sisal mikro tersilanisasi terhadap *setting time* semen ionomer kaca konvensional.

Penelitian menggunakan SIK (Fuji II GC, Jepang) dan serat sisal (Balittas, Indonesia). Tahap-tahap pembuatan sisal mikro meliputi *scouring*, netralisasi, *bleaching*, hidrolisis, dan pengeringan. Pengujian ukuran sisal mikro dilakukan menggunakan SEM. Penelitian dilakukan terhadap 16 sampel berbentuk balok berukuran 10x8x5 mm. Kelompok uji masing-masing 4 sampel terdiri atas kelompok kontrol dan 3 kelompok perlakuan (penambahan sisal mikro tersilanisasi dengan kadar 1%, 3%, dan 5%). Pengujian *setting time* menggunakan jarum *Gillmore*. Data dianalisis menggunakan uji *Kruskal Wallis* dan uji *post-hoc Mann-Whitney U*.

Hasil dari penelitian rerata *setting time* SIK dengan penambahan sisal mikro tersilanisasi secara berurutan yaitu: $308,75 \pm 17,5$ (K); $308,75 \pm 17,5$ (P1%); $256,25 \pm 17,5$ (P3%); $291,25 \pm 17,5$ (P5%) detik. Hasil uji *Kruskal Wallis* menunjukkan perbedaan pengaruh variasi kadar penambahan sisal mikro tersilanisasi terhadap *setting time* semen ionomer kaca konvensional ($p < 0,05$). Hasil uji *Mann-Whitney U* menunjukkan variasi penambahan sisal mikro tersilanisasi memiliki perbedaan bermakna ($p < 0,05$) terhadap *setting time* semen ionomer kaca konvensional. Kesimpulan penelitian ini adalah variasi kadar penambahan sisal mikro tersilanisasi mempengaruhi *setting time* semen ionomer kaca konvensional.

Kata kunci: Semen ionomer kaca, sisal (*Agave sisalana*), silan, *setting time*

ABSTRACT

Glass ionomer cement (GIC) is one of the widely used dental restorative materials due to its biocompatibility. GIC is lack of mechanical properties. Reinforcement can be added to accomplish its mechanical properties. One of the natural reinforcements that can be used is sisal fiber (*Agave sisalana*). Coupling agent silane is added to increase the adhesion between reinforcement and GIC. The purpose of this research is to determine the optimal setting time of conventional GIC with silanized micro sisal.

Fuji II GIC (GC, Japan) and sisal fiber (Balittas, Indonesia) are materials used in this research. Steps in making of micro sisal were scouring, bleaching, hydrolysis, and drying. SEM was used to assure the size of micro sisal. The research was conducted to 16 block-shaped samples sized 10x8x5 mm. Each test consisted of control group and 3 treatments group (additional 1%, 3%, and 5% silanized micro sisal). The setting time was measured by Gillmore needle. Data were analyzed by Kruskal Wallis and post-hoc Mann-Whitney U test.

The results showed the mean of setting time of silanized micro sisal on GIC respectively were: 308.75 ± 17.5 (control); 308.75 ± 17.5 (P1%); 256.25 ± 17.5 (P3%); 291.25 ± 17.5 (P5%) seconds. Kruskal Wallis test showed the difference in the effect of various amount of silanized micro sisal added to conventional GIC towards its setting time ($p < 0.05$). Mann-Whitney U test showed various amount of silanized micro sisal on conventional GIC had significant differences in setting time ($p < 0.05$). The conclusion of this research is a variety of amount of silanized micro sisal on conventional GIC influenced the setting time of conventional GIC.

Keywords: Glass ionomer cement, sisal (*Agave sisalana*), silane, setting time