INTISARI

Semen ionomer kaca konvensional merupakan salah satu bahan restorasi kedokteran gigi yang menjadi pilihan karena mampu melepaskan flour serta memiliki biokompatibilitas yang baik. Kekurangan SIK terletak pada sifat mekanis yang lemah (kekuatan fleksural). Serat sisal (*Agave sisalana*) merupakan salah satu *reinforcement* alami. Tujuan dari penelitian ini adalah untuk mengetahui kadar optimum penambahan kadar sisal mikro tersilanisasi terhadap kekuatan fleksural semen ionomer kaca konvensional.

Penelitian ini menggunakan serat sisal (Balittas, Malang, Indonesia), semen ionomer kaca (Fuji II GC, Jepang). Pembuatan sisal mikro melalui proses *scouring*, netralisasi, *bleaching*, hidrolisis, dan pengeringan. *Scanning electron microscopy* (SEM) untuk menguji ukuran sisal mikro. Silan ditambahkan ke dalam sisal mikro sebelum dicampur ke dalam semen ionomer kaca konvensional. Sampel berbentuk balok dengan ukuran 2x2x25 mm sebanyak 16 sampel yang terbagi atas 4 kelompok yaitu kelompok penambahan sisal mikro 0%, 1%,3% dan 5%. Uji kekuatan fleksural dengan *universal terting maching*. Analisis data kekuatan fleksural secara statistik menggunakan uji *one-way ANOVA* dan uji *post hoc* LSD.

Hasil dari penelitian menunjukkan rerata kekuatan fleksural SIK kelompok kontrol dan dengan penambahan sisal mikro tersilanisasi 1%, 3% dan 5% yaitu 17,74 ± 0,50 MPa,15,20 ± 2,14 MPa, 22,47 ± 1,41 MPa, dan 16,85 ± 0,63 MPa. Hasil uji ANAVA menunjukkan bahwa terdapat pengaruh variasi kadar penambahan sisal mikro tersilanisasi terhadap kekuatan fleksural dengan perbedaan bermakna ($p<0,05$). Berdasarkan uji LSD diperoleh bahwa kelompok P3% terdapat kenaikan kekuatan fleksural dengan perbedaan bermakna ($p<0,05$). Kesimpulan penelitian adalah sisal mikro tersilanisasi 3% merupakan kadar optimal pada kekuatan fleksural semen ionomer kaca.

Kata kunci: Semen ionomer kaca, sisal (*Agave sisalana*), silan, kekuatan fleksural

ABSTRACT

Conventional glass ionomer cement is one of the commonly used dental restorative materials because it releases fluoride and has good biocompatibility. The weakness of GIC lies in its weak mechanical properties (flexural strength). Sisal fiber (Agave sisalana) is one of the natural reinforcement. This research aims to determine the optimum level of addition of silanized micro sisal content to the flexural strength of conventional glass ionomer cement.

This study used sisal fiber (Balittas, Malang, Indonesia), glass ionomer cement (Fuji II GC, Japan). Micro sisal was produced by scouring, neutralization bleaching, hydrolysis, and drying. A scanning electron microscope (SEM) is used to test micro sisal size. Silane is added to micro sisal before being mixed into conventional glass ionomer cement. Samples in the form of blocks with a size of 2x2x25 mm were 16 samples divided into 4 groups, namely groups of 0%, 1%, 3%, and 5% addition of micro sisal. Flexural strength was measured by a universal testing machine. Statistical data analysis was done by one-way ANOVA test and post-hoc LSD test.

The results of the study showed that the mean flexural strength of GIC in the control group and with the addition of 1%, 3%, and 5% sterilized micro sisal was 17.74 ± 0.50 MPa, 15.20 ± 2.14 MPa, 22.47 ± 1.41 MPa, and 16.85 ± 0.63 MPa.

The ANOVA test result showed that the addition of a various level of silanized micro sisal to glass ionomer cement affected its flexural strength significantly ($p<0.05$). Based on the LSD test, it was found that the P3% group had increased flexural strength with a significant difference ($p <0.05$). The conclusion of this research is that 3% of silanized micro sisal is the optimal level of the flexural strength of glass ionomer cement.

Keyword: glass ionomer cement, agave sisalana, silane, flexural strength