

## INTISARI

Karies merupakan penyakit yang paling banyak ditemui di dalam rongga mulut. Resin komposit merupakan salah satu bahan restorasi yang sering digunakan dalam kedokteran gigi. Resin komposit dapat diperkuat dengan menambahkan *reinforcement fiber*. *Silk fiber Bombyx mori* adalah salah satu *filler fiber* terkuat yang dapat ditambahkan di dalam resin komposit. *Silane* sebagai *coupling agent* ditambahkan untuk mengikat bagian organik (matriks resin) dan anorganik (*filler*) pada bagian *interface* resin. Tujuan dari penelitian ini adalah untuk mengetahui efek penambahan *silane* sebagai *coupling agent* terhadap penyerapan air resin komposit dengan *reinforcement silk fiber Bombyx mori*.

Bahan yang digunakan: *flowable unfilled resin* (Ultradent Products Inc., USA), *silane* (Ultradent Products Inc., USA), dan *fiber Bombyx mori*. *Fiber* dibuat nanopartikel dan dibagi 2 kelompok: dengan *silane* dan tanpa *silane*. Masing-masing kelompok berjumlah 6 sampel ( $n=6$ ). Sampel selanjutnya di *light cure* selama 20 detik dan dilakukan uji penyerapan air selama 7 hari di dalam inkubator. Sampel ditimbang menggunakan timbangan digital sebelum dan sesudah dilakukan pengujian. Data yang diperoleh dianalisis menggunakan *paired sample t-test*.

Hasil penelitian menunjukkan bahwa rerata penyerapan air kelompok dengan silanisasi lebih rendah yaitu yaitu  $0,83 \pm 0,753$  mg dibandingkan dengan kelompok tanpa silanisasi yaitu  $2,50 \pm 1,049$  mg. Data yang diperoleh terdistribusi normal dan homogen. Hasil analisis *paired sample t-test* menunjukkan statistik  $t = -3,371$  dengan signifikansi 0,020, sehingga kedua rerata tersebut berbeda bermakna. Kesimpulan dari penelitian ini adalah proses silanisasi pada *silk fiber Bombyx mori* berpengaruh menurunkan penyerapan air resin komposit.

Kata kunci: *Silane*, penyerapan air, resin komposit, *silk fiber Bombyx mori*.

## ABSTRACT

*Caries is the most common disease in the oral cavity. Composite resin is one of the most commonly used restorative materials in dentistry. Composite resin can be strengthened by adding reinforcement fiber. Bombyx mori silk fiber is one of the strongest filler fibers that can be added in composite resin. Silane, as a coupling agent is added to bind the organic (resin matrix) and inorganic (filler) parts at the resin interface. The purpose of this present study was to determine the effect of adding silane as a coupling agent to the water absorption of composite resin with reinforcement Bombyx mori silk fiber.*

*Materials that were used in this study were as follows: flowable unfilled resin (Ultradent Products Inc., USA), silane (Ultradent Products Inc., USA), and Bombyx mori fiber. The fibers were made into nanoparticles and divided into 2 groups: with silane and without silane. Each group consisted of 6 samples (n=6). The samples were then being light cured for 20 seconds and the water absorption test was carried out for 7 days in the incubator. The samples were weighed using a digital scale before and after testing. The obtained data were then analyzed using Paired Sample t-Test.*

*The result of this study revealed that the mean value of water absorption of the silanized group was lower, which was  $0,83 \pm 0,753$  mg compared to the non-silanized group which was  $2,50 \pm 1,049$  mg. The obtained data was normally distributed and homogeneous. The result of the paired sample t-test analysis showed the statistic  $t = -3,371$  with a significance value of 0,020, which means that those two means were significantly different. The conclusion of this study is that the silanization process on Bombyx mori silk fiber had an effect on reducing the water absorption of composite resin.*

*Keywords: Silane, water absorption, composite resin, Bombyx mori silk fiber.*