

INTISARI

Resin akrilik sering digunakan sebagai bahan basis gigi tiruan lengkap karena mudah diproses, ekonomis, dan secara estetik memuaskan. Kekurangan resin akrilik adalah kekuatan fleksural yang lemah. Tujuan penelitian untuk mengetahui pengaruh penambahan sisal mikro tersilanisasi terhadap kekuatan fleksural *base plate* resin akrilik.

Penelitian menggunakan serat sisal (Balittas, Malang, Indonesia) dan resin akrilik *heat cured* (*Stellon*, Inggris). Sisal mikro dibuat dari serat sisal digunting sepanjang 2 mm kemudian dilakukan *scouring* (NaOH 6%), netralisasi (CH₃COOH 2%), *bleaching* (H₂O₂ 3%), hidrolisis (H₂SO₄ 30%), dan pengeringan. Hasil SEM menunjukkan sisal mikro berukuran panjang 3,75 - 103 µm dan diameter 0,86 - 18,4 µm. Silanisasi dilakukan dengan cara *silane* sebagai *coupling agent* diteteskan pada sisal mikro hingga terbasahi merata kemudian dikeringkan. Delapan sampel berukuran 65 x 10 x 2,5 mm dibagi menjadi 2 kelompok yaitu kelompok kontrol dan kelompok perlakuan. Sampel kelompok perlakuan dibuat dengan mencampurkan sisal mikro tersilanisasi dan polimer resin akrilik 30% : 70% (v/v), kemudian ditambahkan monomer resin akrilik (3 : 1) dan dilakukan proses kuring. Uji kekuatan fleksural dilakukan dengan alat *universal testing machine* dengan metode *3-point bending test* dan kecepatan 2 mm/menit. Data kekuatan fleksural dianalisis secara statistik menggunakan uji t tidak berpasangan ($\alpha = 0,05$).

Hasil uji t tidak berpasangan menunjukkan adanya perbedaan yang bermakna pada rerata kekuatan fleksural kelompok perlakuan ($92,35 \pm 1,77$ MPa) dan kelompok kontrol ($88,45 \pm 2,15$ MPa). Kesimpulan penelitian adalah penambahan sisal mikro tersilanisasi berpengaruh meningkatkan kekuatan fleksural *base plate* resin akrilik.

Kata kunci: Resin akrilik, *Agave sisalana*, sisal mikro, *silane*, kekuatan fleksural.

ABSTRACT

Acrylic resin still used as complete denture base material because it was easy to process, economical, and aesthetically satisfying. Acrylic resin is lack of flexural strength. Study aims to evaluate the effect on addition of silanized micro sisal to flexural strength of acrylic resin base plate.

Material used were sisal fiber (Balittas, Malang, Indonesia) and heat cured acrylic resin (Stellon, UK). Micro sisal was made from sisal fiber cut into 2 mm length followed by scouring (NaOH 6%), neutralization (CH₃COOH 2%), bleaching (H₂O₂ 3%), hydrolysis (H₂SO₄ 30%), and drying. SEM result showed micro sisal was 3,75 - 103 μ m in length and diameter was 0,86 - 18,4 μ m. Silanization was done by silane dripped on micro sisal evenly and then dried. Eight samples with 65 x 10 x 2.5 mm in size were divided into two groups, that were control group and treatment group. Treatment group sample was made by mixing silanized micro sisal and acrylic resin polymer 30% : 70% (v/v) evenly, and acrylic resin monomer was added (3 : 1) then curing process was done. Flexural strength was measured using universal testing machine with 3-point bending test method and 2 mm/min in speed. Data were analyzed statistically using unpaired t-test ($\alpha = 0.05$).

Result showed significant difference between mean flexural strength of treatment group (92.35 ± 1.77 MPa) and control group (88.45 ± 2.15 MPa). The conclusion of this study was the addition of silanized micro sisal increasing the flexural strength of acrylic resin base plate.

Keyword: Acrylic resin, *Agave sisalana*, micro sisal, silane, flexural strength.