

INTISARI

Kelemahan resin akrilik sebagai bahan *base plate* gigi tiruan adalah lemahnya sifat mekanis salah satunya kekerasan. Penambahan penguat serat sisal dapat meningkatkan sifat mekanis. Pembuatan sisal menjadi ukuran mikro bertujuan agar sifat mekanis resin akrilik semakin meningkat. Silanisasi merupakan perlakuan pada serat dengan *silane* sehingga serat dapat berikatan dengan resin akrilik. Penelitian ini bertujuan untuk mengetahui pengaruh penambahan sisal mikro tersilanisasi terhadap kekerasan *base plate* resin akrilik.

Bahan penelitian yang digunakan adalah resin akrilik kuring panas (*Stellon*, Inggris) dan serat sisal (Balittas, Indonesia). Pembuatan sisal mikro dilakukan melalui proses *scouring* (NaOH 6%), *bleaching* (H₂O₂ 3%), hidrolisis (H₂SO₄ 30%), dan pengeringan. *Silane* diteteskan pada sisal mikro hingga merata. Sisal mikro dibiarkan mengering dan dicampurkan ke dalam serbuk resin akrilik (30% v/v). Sampel penelitian berbentuk balok ukuran 25x10x3mm. Sampel dibagi menjadi 2 kelompok yaitu kelompok kontrol tanpa penguat dan kelompok perlakuan dengan penguat (n=8). Kekerasan diukur menggunakan alat uji Vickers dengan beban 200 gram selama 15 detik. Data kekerasan dianalisis secara statistik menggunakan *independent t-test* ($\alpha=0,05$).

Hasil penelitian menunjukkan rerata kekerasan kelompok kontrol sebesar 76,913±5,5540 VHN dan kelompok perlakuan sebesar 83,113±5,8973 VHN. Hasil *independent t-test* menunjukkan terdapat perbedaan yang bermakna antara kekerasan kelompok kontrol dan kelompok perlakuan. Kesimpulan penelitian ini adalah kekerasan *base plate* resin akrilik dengan penambahan sisal mikro tersilanisasi lebih tinggi dibandingkan kekerasan *base plate* resin akrilik tanpa penambahan sisal mikro tersilanisasi.

Kata kunci: Resin akrilik, *Agave sisalana*, sisal mikro, *silane*, kekerasan

ABSTRACT

The weakness of acrylic resin as denture base plate is low mechanical properties including hardness. The addition of the sisal fiber reinforcement to the acrylic resin can improve the mechanical properties. The treatment to make sisal into micro size aims to increase the mechanical properties of the acrylic resin. Silanization is the silane treatment to the fiber so that fiber can bind with the acrylic resin. This research aims to determine the effect on the addition of silanized micro sisal to the hardness of acrylic resin base plate.

The materials of this research are heat cured acrylic resin (Stellon, UK) and sisal fiber (Balittas, Indonesia). Micro sisal was made through the process of scouring (NaOH 6%), bleaching (H₂O₂ 3%), hydrolysis (H₂SO₄ 30%), and drying. Silane was dripped to the micro sisal evenly. After the micro sisal dry, the micro sisal was added into the acrylic resin powder (30% v/v). The shape of the samples were rod with size 25x10x3mm. The samples were divided into two groups: the control group without micro sisal reinforcement and the treated group with micro sisal reinforcement (n=8). Hardness was measured using Vickers test with a load of 200 grams for 15 seconds. The result were statistically analyzed by using independent t-test ($\alpha=0.05$).

The result showed the mean of control group hardness number is 76.913 ± 5.5540 VHN and the treated group is 83.113 ± 5.8973 VHN. The result of independent t-test showed the significant difference between the hardness number of the control group and the treated group. The conclusion was the hardness of acrylic resin base plate with silanized micro sisal reinforcement is higher than the hardness of acrylic resin base plate without silanized micro sisal reinforcement.

Keyword: Acrylic resin, *Agave sisalana*, micro sisal, silane, hardness