

INTISARI

Resin akrilik adalah polimer turunan asam akrilat, asam metakrilat, dan monomer akrilat. Resin akrilik polimerisasi panas sering digunakan sebagai bahan pembuatan basis gigi tiruan dikarenakan memiliki biokompatibilitas tinggi dengan estetika yang baik, namun kekuatan fisik dan mekaniknya kurang baik daripada bahan basis gigi tiruan lainnya. Nanoselulosa rosella merupakan bahan engisi tambahan untuk memperkuat resin akrilik. Tujuan penelitian ini untuk mengkaji pengaruh penambahan nanoselulosa rosella terhadap kekasaran permukaan plat gigi tiruan resin akrilik polimerisasi panas.

Penelitian ini merupakan eksperimental laboratoris menggunakan 25 sampel plat gigi tiruan resin akrilik ukuran 65 x 10 x 2,5 mm. Sampel dibagi 5 kelompok perlakuan: kelompok tanpa penambahan nanoselulosa sebagai kontrol dan kelompok penambahan nanoselulosa 2,5 wt%, 5 wt%, 7,5 wt%, dan 10 wt%. Kekasaran permukaan plat gigi tiruan resin akrilik polimerisasi panas diuji menggunakan profilometer (Starret, SR 300 *Surface Roughness Tester*, USA). Data yang diperoleh dianalisis menggunakan Uji Anava satu jalur dilanjutkan dengan *Post Hoc* LSD dengan tingkat kepercayaan 95%.

Hasil penelitian didapatkan nilai rata-rata kekasaran permukaan terendah resin akrilik diperkuat nanoselulosa adalah sebesar $0,260 \pm 0,044 \mu\text{m}$. Hasil uji Anava satu jalur menunjukkan perbedaan yang bermakna ($p < 0,05$) pada nilai kekasaran permukaan plat gigi tiruan polimerisasi panas antar kelompok perlakuan. Uji *Post Hoc* LSD terdapat perbedaan yang signifikan ($p < 0,05$) 5) antara kelompok kontrol dengan kelompok penambahan nanoselulosa rosella 5 wt%, 7,5 wt% 10 wt%; antara kelompok penambahan nanoselulosa 7,5% wt dengan kelompok penambahan nanoselulosa rosella 2,5 wt% dan 5 wt%; dan antara kelompok penambahan nanoselulosa rosella 10 wt% dengan kelompok penambahan nanoselulosa rosella 2,5 wt% dan 5 wt%.

Kesimpulan penelitian ini yaitu penambahan nanoselulosa rosella 5 wt%, 7,5 wt%, dan 10 wt% berpengaruh terhadap kekasaran permukaan plat gigi tiruan resin akrilik polimerisasi panas. Pengaruh kekasaran permukaan minimal basis gigi tiruan resin akrilik polimerisasi panas diperkuat nanoselulosa rosella adalah pada penambahan nanoselulosa rosella 2,5 wt%.

Kata kunci: resin akrilik polimerisasi panas, rosella, nanoselulosa, kekasaran permukaan

ABSTRACT

Acrylic resin is a polymer derivative of acrylic acid, methacrylic acid, and acrylate monomer. Heat-cured acrylic resins are the most commonly used denture base material because it has high biocompatibility with good aesthetics, but its physical and mechanical strength is less good than other denture base materials. Nanocellulose of roselle is a reinforcing filler to strengthen acrylic resin. This research aims to examine the effect of the addition of roselle nanocellulose on the surface roughness of heat-cured acrylic resin denture base.

This research is a laboratory experiment using 25 samples of heat-cured acrylic resin denture base with the size 65 x 10 x 2.5 mm. The samples were divided into 5 groups: the group without adding nanocellulose as a control and the group adding 2.5 wt%, 5 wt%, 7.5 wt% and 10 wt% of nanocellulose. The surface roughness of the heat-cured acrylic resin denture base was tested using a profilometer (Starret, SR 300 Surface Roughness Tester, USA). The data obtained were analyzed using the one-way Anova test followed by Post Hoc LSD with a confidence level of 95%.

The results showed that the lowest average surface roughness value of nanocellulose-reinforced acrylic resin was $0.260 \pm 0.044 \mu\text{m}$. The results of the one-way ANOVA test showed a significant difference ($p < 0.05$) in the surface roughness value of the heat-cured acrylic resin denture base between treatment groups. Post Hoc LSD test showed a significant difference ($p < 0.05$) between the control group and the addition group of nanocellulose roselle (*Hibiscus sabdariffa*) 5 wt%, 7.5 wt% and 10 wt%; between the addition group of 7.5 wt% roselle nanocellulose and the addition groups of 2.5 wt% and 5 wt% roselle nanocellulose; between the the addition group of 10 wt% roselle nanocellulose with the addition groups of 2.5 wt% and 5 wt% roselle nanocellulose.

The conclusion of this research is that the addition of 5 wt%, 7.5 wt% and 10 wt% roselle nanocellulose has the effect on the surface roughness of the heat-cured acrylic resin denture based. The effect of minimal surface roughness of the heat-cured acrylic resin denture base reinforced with roselle nanocellulose is on the addition of 2.5 wt roselle nanocellulose.

Key words: heat-cured acrylic resin, roselle, nanocellulose, surface roughness