

## INTISARI

Resin akrilik polimerisasi panas memiliki kekurangan mudah patah apabila terjatuh pada permukaan yang keras. Serat daun nanas dapat digunakan sebagai penguat basis gigi tiruan resin akrilik. Tujuan penelitian untuk mengetahui pengaruh penambahan jumlah bundel serat daun nanas terhadap kekuatan impak, kekuatan fleksural dan penyerapan air resin akrilik polimerisasi panas.

Sampel penelitian dibuat sebanyak 25 resin akrilik polimerisasi panas untuk setiap pengujian. Variasi kelompok kelompok I-V berdasarkan jumlah bundel serat daun nanas 0,1,2,3,4,5 (n=5). Bundel terdiri dari 20 helai serat dipilin dan diletakkan lurus pada tengah sampel. Pengukuran kekuatan impak menggunakan penguji impak, kekuatan fleksural menggunakan UTM dan penyerapan air menggunakan timbangan digital. Data dianalisis menggunakan uji ANAVA satu jalur dan LSD.

Hasil penelitian menunjukkan rerata dan simpangan baku Kekuatan impak ( $\text{kJ/m}^2$ ) kelompok I-V :  $3,24 \pm 0,70$ ;  $3,74 \pm 0,94$ ;  $4,24 \pm 0,84$ ;  $4,75 \pm 0,96$ ;  $5,76 \pm 0,72$ ; Kekuatan fleksural (MPa) kelompok I-V :  $76,67 \pm 8,74$ ;  $79,96 \pm 5,84$ ;  $81,81 \pm 4,31$ ;  $86,80 \pm 3,98$ ;  $87,49 \pm 6,17$ ; Penyerapan air ( $\mu\text{g/mm}^3$ ) kelompok I-V :  $24,72 \pm 0,44$ ;  $26,69 \pm 0,32$ ;  $27,06 \pm 1,64$ ;  $28,26 \pm 2,22$ ;  $29,52 \pm 1,31$ . Hasil uji ANAVA satu jalur menunjukkan penambahan jumlah bundel mempengaruhi kekuatan impak, kekuatan fleksural dan penyerapan air resin akrilik ( $p < 0,05$ ). Hasil uji  $\text{LSD}_{0,05}$  menunjukkan perbedaan bermakna: a) Kekuatan impak kelompok I dengan IV, V; b) Kekuatan fleksural kelompok I dengan IV, V; c) Penyerapan air antar seluruh kelompok. Kesimpulan penelitian ini penambahan jumlah bundel serat daun nanas meningkatkan kekuatan impak, kekuatan fleksural dan penyerapan air resin akrilik polimerisasi panas.

**Kata kunci:** resin akrilik polimerisasi panas, serat daun nanas, kekuatan impak, kekuatan fleksural, penyerapan air

## **ABSTRACT**

*Heat-cured acrylic resin has the disadvantage of being prone to fracture when dropped suddenly onto a hard surface. Pineapple leaf fibers can be used as reinforcement for heat-cure acrylic resin. This study aims to investigate the effect of adding varying numbers of pineapple leaf fiber bundles on the impact strength, flexural strength, and water absorption of heat-cured acrylic resin.*

*A total of 25 heat-cured acrylic resin samples were prepared for each test. The groups (I–V) varied based on the number of pineapple leaf fiber bundles: 0, 1, 2, 3, 4, and 5 ( $n = 5$ ). Each bundle consisted of 20 twisted fibers and was placed in a straight line at the center of the sample. Impact strength was measured using an Impact Tester, flexural strength using a Universal Tester Machine (UTM), and water absorption using a digital scale. The data were analyzed using one-way ANOVA and the LSD test.*

*The study results showed mean and standard deviation values for Impact strength ( $\text{kJ/m}^2$ ) group I–V:  $3.24 \pm 0.70$ ;  $3.74 \pm 0.94$ ;  $4.24 \pm 0.84$ ;  $4.75 \pm 0.96$ ;  $5.76 \pm 0.72$ ; Flexural strength (MPa) group I–V:  $76.67 \pm 8.74$ ;  $79.96 \pm 5.84$ ;  $81.81 \pm 4.31$ ;  $86.80 \pm 3.98$ ;  $87.49 \pm 6.17$ ; Water absorption ( $\mu\text{g/mm}^3$ ) group I–V:  $24.72 \pm 0.44$ ;  $26.69 \pm 0.32$ ;  $27.06 \pm 1.64$ ;  $28.26 \pm 2.22$ ;  $29.52 \pm 1.31$ . One-way ANOVA test results showed that the addition of pineapple leaf fiber bundles significantly affected the impact strength, flexural strength, and water absorption of the acrylic resin ( $p < 0.05$ ). The  $\text{LSD}_{0.05}$  test results indicated significant differences in a) Impact strength between Group I and Groups IV, V; b) Flexural strength between Group I and Groups IV, V; c) Water absorption among all groups. The addition of pineapple leaf fiber bundles can enhance the impact strength, flexural strength, and water absorption of heat-cured acrylic resin.*

**Keywords:** *heat-cured acrylic resin, pineapple leaf fiber, impact strength, flexural strength, water absorption*