

ABSTRACT

The denture base material that is currently widely used is heat-polymerized acrylic resin because it has good aesthetic advantages, high biocompatibility, is non-toxic, does not irritate tissues, has good physical properties, is relatively cheap, can be prepared, and is easy to manipulate and manufacture. However, the surface of the denture base facing the rough mucosa is not polished triggering the growth of *Candida albicans* colonies so that it can cause *denture stomatitis*. Chitosan from white-legged shrimp shells (*Litopenaeus vannamei*) has potential as an antifungal agent. The purpose of this study was to analyze the difference between a mixture and a coating of nanochitosan from white-legged shrimp shells (*Litopenaeus vannamei*) on a heat-polymerized acrylic resin base in reducing the number of *Candida albicans* colonies. The design used in this study was a true experimental laboratories with a posttest-only group design with a total of $n = 45$ and consisting of 5 groups. 4 treatment groups of 1% mixture, 1% coating, 2% mixture and 2% coating of nanochitosan from white-legged shrimp shells (*Litopenaeus vannamei*). 1 control group K (without treatment). The number of *Candida albicans* colonies was measured using a Colony Counter. The results showed the average number of *Candida albicans* colonies, namely the control group 121.56 ± 9.57 , 1% mixture 56.44 ± 7.37 and 1% coating 70.22 ± 9.96 . While the 2% control group 121.56 ± 9.57 , 2% mixture 8.89 ± 1.69 and 2% coating 12.78 ± 2.05 . At concentrations of 1% and 2% the data were normally distributed. The *one-way ANOVA* test showed a significant difference ($p < 0.001$). The *LSD post hoc* test showed a significant difference ($p < 0.001$) in all treatments compared to the control. Likewise, all treatments showed a significant difference ($p < 0.05$). From the results of this study, it can be concluded that there is a difference between the mixture and coating of white-legged shrimp shell nanochitosan (*Litopenaeus vannamei*) at both 1% and 2% concentrations, where the mixture method is more effective than coating on heat-polymerized acrylic resin plates in reducing the number of *Candida albicans* colonies.

Keywords: Heat-polymerized acrylic resin, shrimp shell nanochitosan, *Candida albicans*

ABSTRAK

Bahan basis gigi tiruan yang saat ini banyak digunakan adalah resin akrilik polimerisasi panas karena memiliki keunggulan estetika baik, biokompatibilitas tinggi, bersifat tidak toksik, tidak mengiritasi jaringan, sifat fisik, harga relatif murah, dapat dipreparasi, serta mudah cara manipulasi dan pembuatannya. Namun, permukaan basis gigi tiruan yang menghadap mukosa kasar tidak dipoles memicu pertumbuhan koloni *Candida albicans* sehingga dapat menyebabkan terjadinya *denture stomatitis*. Kitosan cangkang udang kaki putih (*Litopenaeus vannamei*) memiliki potensi sebagai agen antijamur. Tujuan penelitian ini adalah menganalisis perbedaan antara campuran dan pelapisan nanokitosa cangkang udang kaki putih (*Litopenaeus vannamei*) pada basis resin akrilik polimerisasi panas dalam menurunkan jumlah koloni *Candida albicans*. Rancangan yang digunakan dalam penelitian ini adalah *true experimental laboratories* dengan *posttest-only group design* dengan jumlah $n = 45$ dan terdiri dari 5 kelompok. 4 kelompok perlakuan campuran 1%, pelapisan 1%, campuran 2% dan pelapisan 2% nanokitosa cangkang udang kaki putih (*Litopenaeus vannamei*). 1 kelompok kontrol K (tanpa perlakuan). Jumlah koloni *Candida albicans* diukur menggunakan *Colony Counter*. Hasil penelitian menunjukkan rerata jumlah koloni *Candida albicans* yaitu kelompok kontrol $121,56 \pm 9,57$, campuran 1% $56,44 \pm 7,37$ dan pelapisan 1% $70,22 \pm 9,96$. Sedangkan kelompok 2% kelompok kontrol $121,56 \pm 9,57$, campuran 2% $8,89 \pm 1,69$ dan pelapisan 2% $12,78 \pm 2,05$. Pada konsentrasi 1% maupun 2% data berdistribusi normal. Uji *one way ANOVA* menunjukkan beda signifikan ($p < 0,001$). Uji *post hoc LSD* semua perlakuan menunjukkan beda signifikan ($p < 0,001$) terhadap kontrol. Demikian juga semua antar perlakuan menunjukkan beda signifikan ($p < 0,05$). Dari hasil penelitian ini dapat disimpulkan bahwa terdapat perbedaan antara campuran dan pelapisan nanokitosa cangkang udang kaki putih (*Litopenaeus vannamei*) baik konsentrasi 1% maupun 2% dimana metode campuran lebih efektif dibanding pelapisan pada plat resin akrilik polimerisasi panas dalam menurunkan jumlah koloni *Candida albicans*.

Kata kunci: Resin akrilik polimerisasi panas, nanokitosa cangkang udang, *Candida albicans*