

## INTISARI

*Denture stomatitis* karena *Candida albicans* dapat diatasi dengan membersihkan gigi tiruan menggunakan agen pembersih kimiawi. Cu-zeolit alam aktif adalah material antimikroba gabungan logam berat tembaga dan material pembawa zeolit alam teraktivasi. Penelitian ini bertujuan untuk mengetahui pengaruh konsentrasi suspensi Cu-zeolit alam aktif dalam akuades terhadap daya antimikroba pada *C. albicans*.

Penelitian ini menggunakan zeolit alam (Wonosari), larutan HCl 2 M, serbuk  $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$  (Merck, Jerman), biakan *C. albicans*, dan agar *Sabouraud* (Merck, Jerman). Zeolit alam (50 g) diaktivasi menggunakan 500 mL larutan HCl 2 M (1 jam/ $100^\circ\text{C}$ ), disaring, dicuci, dan dikeringkan ( $105^\circ\text{C}/24$  jam). Zeolit alam aktif lalu direaksikan dengan 250 mL larutan  $\text{CuCl}_2$  0,2 M (1 jam/ $100^\circ\text{C}$ ), disaring, dicuci, dan dikeringkan ( $100^\circ\text{C}/24$  jam). Serbuk Cu-zeolit alam aktif dicampurkan dengan akuades steril membentuk suspensi berkonsentrasi 9 mg/mL, 18 mg/mL, dan 36 mg/mL ( $n=4$ ). Suspensi tersebut dikontakkan dengan *C. albicans* selama 120 menit, diencerkan, dan ditanam pada media agar *sabouraud* lalu diinkubasi ( $48$  jam/ $37^\circ\text{C}$ ). Jumlah koloni yang tumbuh dihitung dalam satuan CFU/mL. Data dianalisis dengan uji Anava satu jalur ( $\alpha = 0,05$ ) dan  $\text{LSD}_{0,05}$ .

Rerata dan simpangan baku koloni setelah dikontakkan dengan suspensi berturut-turut adalah  $36.800 \pm 6.453$  (konsentrasi 9 mg/mL),  $31.675 \pm 6.445$  (konsentrasi 18 mg/mL), dan  $22.375 \pm 3.025$  (konsentrasi 36 mg/mL) (CFU/mL). Hasil uji Anava satu jalur menunjukkan adanya pengaruh konsentrasi suspensi terhadap daya antimikroba pada *C. albicans* ( $p<0,05$ ). Hasil uji  $\text{LSD}_{0,05}$  menunjukkan perbedaan bermakna antara kelompok konsentrasi suspensi 36 mg/mL dengan 9 mg/mL dan 18 mg/mL ( $p<0,05$ ). Kesimpulan penelitian adalah konsentrasi suspensi Cu-zeolit alam aktif yang tinggi dapat meningkatkan daya antimikroba pada *C. albicans*.

Kata Kunci : Cu-zeolit alam aktif, Konsentrasi, *Candida albicans*, Antimikroba

## ABSTRACT

*Denture stomatitis* caused by *Candida albicans* can be handled by cleaning the denture using chemical cleaning agent. Activated Cu-natural zeolite is an antimicrobial agent combination of copper and carrier agent activated natural zeolite. The aim of this study was to determine the effect of concentration of activated Cu-natural zeolite suspension in aquadest on antimicrobial activity in *C. albicans*.

Materials used were natural zeolite (Wonosari), 2 M HCl solution,  $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$  powder (*Merck*, Germany), cultured *C. albicans*, and Sabouraud agar (*Merck*, Germany). Natural zeolite (50 g) was activated with 500 mL 2 M HCl solution (1 hour/100°C), filtered, washed, and dried (105°C/24 hours). Activated natural zeolite was reacted with 250 mL 0.2 M  $\text{CuCl}_2$  solution (1 hour/100°C), filtered, washed, and dried (100°C/24 hours). Activated Cu-natural zeolite was mixed with sterile aquadest thus forming suspension in 9 mg/mL, 18 mg/mL, and 36 mg/mL concentration (n=4). The suspension then was contacted with *C. albicans* for 120 minutes, diluted, and grown on Sabouraud agar, then incubated (48 hours/37°C). The number of colonies was counted in CFU/mL. Data were analyzed with one way ANOVA test ( $\alpha = 0,05$ ) and  $\text{LSD}_{0,05}$ .

The mean and standard deviation of the number of colonies after contacted with the suspension were  $36.800 \pm 6.453$  (concentration of 9 mg/mL),  $31.675 \pm 6.445$  (concentration of 18 mg/mL), and  $22.375 \pm 3.025$  (concentration of 36 mg/ml) (CFU/mL), respectively. The result of one way ANOVA test showed that there is influence of the concentration of the suspension to antimicrobial activity in *C. albicans* ( $p < 0,05$ ). The result of  $\text{LSD}_{0,05}$  test showed significant differences between the concentration groups of the suspension 36 mg/mL with 9 mg/mL and 18 mg/mL ( $p < 0,05$ ). The conclusion was high concentration of activated Cu-natural zeolite could increase its antimicrobial activity against *C. albicans*.

Keywords : Activated Cu-natural zeolite, Concentration, *Candida albicans*, Antimicrobial