

ABSTRAK

PENGARUH PASTA GIGI NANO-HIDROKSIAPATIT CANGKANG KEONG SAWAH KOMBINASI EKSTRAK DAUN KEMANGI TERHADAP BAKTERI *Streptococcus mutans*

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Karies gigi merupakan kondisi rusaknya permukaan keras gigi akibat bakteri kariogenik dan proses demineralisasi yang disebabkan oleh asam hasil fermentasi bakteri sehingga menimbulkan lubang pada gigi. Salah satu bakteri utama penyebab karies gigi adalah *Streptococcus mutans*. Upaya perawatan karies dapat dilakukan dengan menggosok gigi menggunakan pasta gigi yang mengandung *fluoride* sebagai agen remineralisasi dan bahan herbal sebagai agen antibakteri. Penggunaan *fluoride* yang berlebihan berisiko memicu terjadinya *fluorosis*. Bahan alternatif lain seperti nano-hidroksiapatit (nano-HAp) dari cangkang keong sawah dan ekstrak daun kemangi berpotensi untuk dikembangkan menjadi pasta gigi berbahan alam yang dapat menghambat pertumbuhan bakteri gigi. Penelitian ini bertujuan untuk mengetahui pengaruh pasta gigi nano-HAp cangkang keong sawah kombinasi ekstrak daun kemangi terhadap bakteri *Streptococcus mutans*. Penelitian ini dilakukan dengan 3 kelompok perlakuan berupa pasta gigi ekstrak daun kemangi 5% (P1), pasta gigi nano-HAp cangkang keong sawah 10% (P2), pasta gigi kombinasi ekstrak kemangi 5%-nano-HAp 10% (P3), kontrol positif pasta gigi *fluoride* 1450 ppm, dan kontrol negatif aquades steril dengan 6 kali pengulangan. Data dianalisis menggunakan *Kruskal Wallis* dan *Post Hoc Mann Whitney*. Hasil uji menunjukkan bahwa ketiga perlakuan memiliki aktivitas antibakteri yang kuat (10-20 mm) dibandingkan dengan kontrol negatif. Kelompok P3 menunjukan aktivitas tertinggi dan tidak berbeda signifikan dengan P1, namun berbeda signifikan dengan P2 dan KP. Simpulan pada penelitian ini adalah terdapat pengaruh pasta gigi nano-HAp cangkang keong sawah kombinasi ekstrak daun kemangi terhadap bakteri *Streptococcus mutans*.

Kata Kunci: Cangkang Keong Sawah, Ekstrak Daun Kemangi, Karies Gigi, Pasta Gigi, *Streptococcus mutans*,

ABSTRACT

THE EFFECT OF NANO-HYDROXYAPATITE TOOTHPASTE FROM RICE FIELD SNAIL SHELLS COMBINED WITH BASIL LEAF EXTRACT AGAINST *Streptococcus mutans*

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Dental caries is a condition caused by cariogenic bacteria and demineralization due to acid produced from bacterial fermentation that leading to cavity formation. The main bacteria causing dental caries is *Streptococcus mutans*. Dental caries treatment can be achieved by brushing teeth using toothpaste that contains fluoride as remineralization agent and herbal as antibacterial effect. Excessive use of fluoride can increase dental fluorosis. Other alternative ingredients including nano-hydroxyapatite (nano-HAp) and basil leaf extract have potential into natural toothpaste that can inhibit dental bacteria growth. This study aims to determine the effect of nano-HAp rice field snail shells combined with basil leaf extract toothpaste on *Streptococcus mutans*. This study was conducted with 3 treatment groups consisting 5% basil leaf extract toothpaste (P1), 10% nano-HAp rice field snail shell toothpaste (P2), 10% nano-HAp combined with 5% basil leaf extract toothpaste (P3), 1450 ppm fluoride toothpaste as positive control, and sterile aquades as negative control with 6 repetitions. Data were analyzed using Kruskal Wallis and Mann Whitney's Post Hoc test. The test results showed that all 3 treatment groups had strong antibacterial activity (10-20 mm) compared to the negative control. The P3 group demonstrated the highest activity and wasn't significantly different from P1, but showed significant differences compared to P2 and the positive control. The conclusion of this study is that there is an effect of nano-HAp toothpaste from rice field snail shells combined with basil leaf extract on *Streptococcus mutans*.

Keywords: Basil Leaf Extract, Dental Caries, Nano-Hydroxyapatite, *Streptococcus mutans*, Toothpaste