

## INTISARI

Minyak atsiri cengkeh (*Syzygium aromaticum*) dan kayu manis (*Cinnamomum burmannii*) memiliki sifat antibakteri yang dapat menghambat pertumbuhan bakteri *Streptococcus mutans* pada rongga mulut. Berdasarkan sifat tersebut, kedua bahan ini diformulasikan menjadi sediaan pasta gigi dalam bentuk nanoemulsi. Penelitian ini bertujuan untuk mengetahui aktivitas antibakteri minyak atsiri dan mengetahui formulasi sediaan pasta gigi nanoemulsi kombinasi minyak atsiri cengkeh dan kayu manis. Nanoemulsi dibuat dengan metode nanoemulsi spontan. Pengujian formula nanoemulsi meliputi penentuan ukuran partikel, pengujian transmitan, dan pengujian sentrifugasi. Sedangkan untuk formula sediaan pasta gigi dilakukan uji organoleptis, homogenitas, pH, viskositas, tinggi busa, dan *cycling test*. Optimasi formulasi nanoemulsi dilakukan dengan analisis optimasi sederhana. Kemudian untuk membandingkan formula sediaan pasta gigi dengan produk pembanding dilakukan analisis statistik komparasi *Mann-Whitney* dan *Independent Sample T-Test*. Hasil penelitian menunjukkan bahwa minyak atsiri cengkeh dan kayu manis memiliki aktivitas antibakteri terhadap *Streptococcus mutans*. Nanoemulsi yang paling optimal memiliki perbandingan Tween 80 dan PEG 400 sebesar 40:10. Pasta gigi memuat 4% minyak atsiri cengkeh dan 6% minyak atsiri kayu manis. Sediaan pasta gigi memiliki karakteristik organoleptis yang baik, homogen, pH sesuai persyaratan SNI, dan viskositas yang baik. Namun, hasil uji *cycling test* sediaan pasta gigi menunjukkan bahwa sediaan tidak stabil.

**Kata kunci:** Pasta Gigi, Antibakteri, Minyak Atsiri.

## ABSTRACT

*Clove (*Syzygium aromaticum*) and cinnamon (*Cinnamomum burmannii*) essential oils have antibacterial properties that can inhibit the growth of *Streptococcus mutans* bacteria in the oral cavity. Based on these properties, these two ingredients are formulated into toothpaste preparations in the form of nanoemulsions. This study aims to determine the antibacterial activity of essential oils and to determine the formulation of toothpaste nanoemulsion combination of clove and cinnamon essential oils. Nanoemulsion was prepared by spontaneous nanoemulsion method. Testing of the nanoemulsion formula includes determining particle size, transmittance testing, and centrifugation testing. As for the toothpaste formulation, organoleptic tests, homogeneity, pH, viscosity, foam height, and cycling tests were carried out. Optimization of the nanoemulsion formulation was carried out by simple optimization analysis. Then to compare the toothpaste preparation formula with the comparison product a Mann-Whitney comparative statistical analysis and the Independent Sample T-Test were carried out. The results showed that clove and cinnamon essential oils had antibacterial activity against *Streptococcus mutans*. The most optimal nanoemulsion has a ratio of Tween 80 and PEG 400 of 40:10. The toothpaste contains 4% clove essential oil and 6% cinnamon essential oil. Toothpaste preparations have good organoleptic characteristics, homogeneous, pH according to SNI requirements, and good viscosity. However, the results of the cycling test of toothpaste preparations showed that the preparations were unstable.*

**Keywords:** *Toothpaste, Antibacterial, Essential Oil.*