ABSTRACT

COMPARISON OF ANTIBACTERIAL ACTIVITY OF SILVER NANOPARTICLE (AgNPs) FORMULATION FROM CACAO LEAF (*Theobroma cacao L.*) AND GREEN TEA (*Camellia sinensis*) EXTRACTS AGAINST *Staphylococcus aureus aureus*

By:

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Background : Silver nanoparticles (AgNPs) demonstrate potent antibacterial potential, and biosynthesis using plant extracts is gaining focus due to its environmentally friendly nature.

Objective : This study aims to compare the antibacterial activity of silver nanoparticle (AgNPs) extract formulations from cacao (*Theobroma cacao* L.) and green tea (*Camellia sinensis*) leaves against *Staphylococcus aureus* bacteria.

Methods : The profile of secondary metabolite compounds can be observed through phytochemical screening. Furthermore, to visualize the silver nanoparticle profile, SEM was used, followed by measuring the highest generated wavelength absorption using UV-Vis spectrophotometry, and antibacterial testing was conducted using the disc diffusion method against *Staphylococcus aureus* bacteria.

Results : The biosynthesis of cacao leaf AgNPs (*Theobroma cacao* L.), green tea leaf AgNPs (*Camellia sinensis*), and combination AgNPs resulted in inhibition zones of 8.00 mm; 13.33 mm; and 10.17 mm, respectively, against *Staphylococcus aureus* bacteria.

Conclusion: The largest inhibition zone diameter was produced by green tea leaf AgNPs (*Camellia sinensis*) against *Staphylococcus aureus* bacteria.

Keywords: antibacterial, cacao leaf, green tea leaf, silver nanoparticles (AgNPs)

ABSTRAK

PERBANDINGAN AKTIVITAS ANTIBAKTERI FORMULASI EKSTRAK NANOPARTIKEL PERAK (AgNPs) DAUN KAKAO (*Theobroma cacao L.*) DAN TEH HIJAU (*Camellia sinensis*) TERHADAP *Staphylococcus aureus*

Oleh :

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Latar belakang : Nanopartikel perak (AgNPs) menunjukkan potensi antibakteri yang kuat, dan biosintesis menggunakan ekstrak tumbuhan menjadi fokus karena sifatnya yang ramah lingkungan.

Tujuan : Penelitian ini bertujuan untuk membandingkan aktivitas antibakteri formulasi ekstrak nanopartikel perak (AgNPs) dari daun kakao (*Theobroma cacao* L.) dan teh hijau (*Camellia sinensis*) terhadap bakteri *Staphylococcus aureus*.

Metode : Profil senyawa metabolit sekunder dapat dilihat melalui skrining fitokimia, kemudian untuk melihat gambaran profil nanopartikel perak dapat menggunakan SEM yang kemudian diukur Panjang resapan gelombang tertinggi yang dihasilkan menggunakan spetrofotometri UV-Vis dan dilakukan uji antibakteri dengan metode difusi cakram terhadap bakteri *Staphylococcus aureus*.

Hasil : Biosintesis AgNPs daun kakao (*Theobroma cacao L.*), AgNPs daun teh (*Camellia sinensis*), dan AgNPs kombinasi menghasilkan zona hambat 8,00 mm; 13,33 mm; 10,17 mm pada bakteri *Staphylococcus aureus.*

Simpulan : Diameter zona hambat terbesar dihasilkan oleh AgNPs daun teh (*Camellia sinensis*) pada bakteri *Staphylococcus aureus.*

Kata kunci : antibakteri, daun kakoa, daun teh, nanopartikel perak (AgNPs)