

ABSTRAK

Latar Belakang: Meningkatnya resistensi *Staphylococcus aureus* terhadap antibiotik telah mendorong pencarian alternatif antimikroba dari sumber alami. Biji kopi hijau Arabika (*Coffea arabica*) diketahui mengandung senyawa bioaktif seperti asam klorogenat dan tanin, yang berpotensi memiliki aktivitas antibakteri. Penelitian ini bertujuan untuk mengevaluasi aktivitas antibakteri infusa air kopi hijau Arabika terhadap *S. aureus* secara in vitro.

Metode: Penelitian ini merupakan penelitian eksperimental murni dengan desain post-test only control group. Infusa kopi hijau Arabika dibuat dalam konsentrasi 50, 100, 200, dan 400 mg/ml, kemudian diuji menggunakan metode difusi cakram Kirby-Bauer terhadap kultur *S. aureus*. Akuades digunakan sebagai kontrol negatif. Diameter zona hambat diukur setelah inkubasi selama 24 jam. Karena data tidak memenuhi asumsi homogenitas varians, analisis dilakukan menggunakan uji Welch ANOVA yang dilanjutkan dengan uji post hoc Games-Howell ($p < 0,05$).

Hasil: Seluruh konsentrasi infusa kopi hijau Arabika menunjukkan aktivitas antibakteri yang terukur. Uji Welch ANOVA menunjukkan perbedaan yang signifikan antar kelompok perlakuan ($p = 0,0003$). Uji post hoc Games-Howell mengonfirmasi adanya perbedaan yang signifikan secara statistik antara seluruh kelompok konsentrasi serta antara masing-masing ekstrak dengan kontrol negatif ($p < 0,05$). Namun, zona hambat yang dihasilkan oleh infusa kopi hijau secara konsisten lebih kecil dibandingkan ciprofloxacin, menunjukkan bahwa meskipun efektif, potensi antibakteri ekstrak belum sebanding dengan antibiotik konvensional.

Kesimpulan: Infusa kopi hijau Arabika menunjukkan aktivitas antibakteri yang signifikan terhadap *Staphylococcus aureus*, dengan efektivitas yang meningkat seiring dengan peningkatan konsentrasi. Meskipun tidak sekuat ciprofloxacin, hasil ini mendukung potensi kopi hijau Arabika sebagai agen antimikroba komplementer.

Kata kunci: *Staphylococcus aureus*, Kopi Hijau Arabika, Antibakteri, Asam Klorogenat, Welch ANOVA, Games-Howell, Zona Hambat.

ABSTRACT

Background: The rise of antibiotic resistance in *Staphylococcus aureus* has prompted the exploration of natural antimicrobial alternatives. Arabica green coffee beans (*Coffea arabica*) are known to contain bioactive compounds such as chlorogenic acid and tannins, which may possess antibacterial effects. This study aimed to evaluate the antibacterial activity of aqueous infusion of Arabica green coffee beans against *S. aureus* using in vitro methods.

Methods: A pure experimental study with a post-test only control group design was conducted. Aqueous extracts of Arabica green coffee were prepared at concentrations of 50, 100, 200, and 400 mg/ml and tested using the Kirby-Bauer disk diffusion method against *S. aureus*. Distilled water served as a negative control. Inhibition zone diameters were measured after 24 hours of incubation. Due to non-homogeneous variance, data were analyzed using Welch ANOVA followed by Games-Howell post hoc test ($p < 0.05$).

Results: All concentrations of Arabica green coffee infusion demonstrated measurable antibacterial activity. Welch ANOVA revealed significant differences among treatment groups ($p = 0.0003$). The post hoc Games-Howell test confirmed statistically significant differences between all concentration groups and between each extract and the negative control ($p < 0.05$). However, inhibition zones produced by the extract were significantly smaller than those produced by ciprofloxacin, indicating that while effective, the extract's potency does not match that of conventional antibiotics.

Conclusion: Infusion of Arabica green coffee beans exhibit significant antibacterial activity against *Staphylococcus aureus*, with effectiveness increasing proportionally to the concentration. Although not as potent as ciprofloxacin, these findings support the potential of Arabica green coffee as a complementary antimicrobial agent.

Keywords: *Staphylococcus aureus*, Arabica Green Coffee, Antibacterial, Chlorogenic Acid, Welch ANOVA, Games-Howell, Inhibition Zone