

ABSTRAK

Amin Fery Firmansyah

Uji Aktivitas Antibakteri Ekstrak Etanol Daun Bidara (*Ziziphus mauritiana* L.) terhadap Pertumbuhan *K. pneumoniae* Isolat Urin Pasien Infeksi Saluran Kemih
145 Halaman + 11 Tabel + 16 Lampiran

Infeksi Saluran Kemih (ISK) merupakan infeksi bakteri tersering di fasilitas kesehatan, dengan *K. pneumoniae* sebagai uropatogen Gram-negatif yang semakin resisten terhadap antibiotik konvensional di Indonesia. Kondisi ini mendorong eksplorasi agen antibakteri alternatif berbasis bahan alam, salah satunya ekstrak etanol daun bidara (*Ziziphus mauritiana* L.) yang mengandung senyawa aktif flavonoid, tanin, saponin, dan alkaloid. Penelitian ini bertujuan menguji aktivitas antibakteri ekstrak etanol daun bidara terhadap pertumbuhan *K. pneumoniae* isolat urin pasien ISK di RSPAL Dr. Ramelan Surabaya, menganalisis pengaruh variasi konsentrasi terhadap zona hambat, dan menentukan konsentrasi optimum. Penelitian menggunakan desain eksperimental laboratoris in vitro dengan metode difusi cakram (*Kirby-Bauer*) pada media Mueller-Hinton Agar. Ekstrak diperoleh melalui maserasi etanol 96% pada konsentrasi 25%, 50%, 75%, dan 100% dengan empat kali replikasi. Isolat *K. pneumoniae* dikonfirmasi menggunakan alat *Vitek 2 Compact*. Analisis statistik menggunakan uji *Kruskal-Wallis* dan *Mann-Whitney*. Hasil uji *Kruskal-Wallis* menunjukkan $H = 22,083$ ($df = 5$; $p = 0,001$). Berdasarkan uji *Mann-Whitney*, konsentrasi 25% tidak berbeda signifikan dari kontrol negatif ($p = 0,317$), sedangkan konsentrasi 50% (11,25 mm), 75% (12,50 mm), dan 100% (16,50 mm) menghasilkan zona hambat kategori kuat dan berbeda signifikan dari kontrol negatif ($p < 0,05$). Konsentrasi optimum adalah 100% (16,50 mm), meskipun masih lebih rendah dari kontrol positif Amikasin 30 μg (22,00 mm: kategori sangat kuat). Ekstrak etanol daun bidara terbukti memiliki aktivitas antibakteri terhadap *K. pneumoniae* pada konsentrasi $\geq 50\%$ dan berpotensi sebagai agen komplementer antibiotik. Penelitian lanjutan berupa penentuan KHM, KBM, uji in vivo, dan fraksinasi bioaktif diperlukan untuk pengembangan lebih lanjut.

Kata Kunci: *Ziziphus mauritiana* L., *Klebsiella pneumoniae*, Antibakteri, Difusi Cakram, Infeksi Saluran Kemih

Daftar Bacaan: 48 referensi (2012–2025)

ABSTRACT

Amin Fery Firmansyah

Antibacterial Activity Test of Bidara Leaf Ethanol Extract (Ziziphus mauritiana L.) against the Growth of K. pneumoniae Urine Isolates from Urinary Tract Infection Patients

145 Pages + 11 Tables + 16 Appendices

Urinary Tract Infection (UTI) is the most prevalent bacterial infection in healthcare facilities, with K. pneumoniae as a Gram-negative uropathogen showing increasing resistance to conventional antibiotics in Indonesia. This condition has prompted exploration of natural-based alternative antibacterial agents, one of which is the ethanol extract of bidara leaf (Ziziphus mauritiana L.) containing active compounds such as flavonoids, tannins, saponins, and alkaloids. This study aimed to examine the antibacterial activity of bidara leaf ethanol extract against the growth of K. pneumoniae urine isolates from UTI patients at RSPAL Dr. Ramelan Surabaya, to analyze the effect of concentration variation on inhibition zones, and to determine the optimum concentration. An in vitro laboratory experimental design was employed using the disk diffusion (Kirby-Bauer) method on Mueller-Hinton Agar. Extracts were obtained through maceration with 96% ethanol at concentrations of 25%, 50%, 75%, and 100% with four replications. The K. pneumoniae isolate was confirmed using the Vitek 2 Compact tool. Statistical analysis was performed using the Kruskal-Wallis and Mann-Whitney tests. The Kruskal-Wallis test yielded $H = 22.083$ ($df = 5$; $p = 0.001$). Mann-Whitney results showed that the 25% concentration did not differ significantly from the negative control ($p = 0.317$), while concentrations of 50% (11.25 mm), 75% (12.50 mm), and 100% (16.50 mm) produced strong-category inhibition zones and were significantly different from the negative control ($p < 0.05$). The optimum concentration was 100% (16.50 mm), though still lower than the positive control Amikacin 30 μ g (22.00 mm; very strong category). Bidara leaf ethanol extract was proven to possess antibacterial activity against K. pneumoniae at concentrations $\geq 50\%$ and has potential as a complementary antibiotic agent. Further research comprising MIC and MBC determination, in vivo testing, and bioactive fractionation is necessary for further development.

Keywords: *Ziziphus mauritiana L., Klebsiella pneumoniae, Antibacterial, Disk Diffusion, Urinary Tract Infection.*

References: 48 references (2012–2025)