

ABSTRAK

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EFEKTIVITAS EKSTRAK DAUN BIDARA ARAB (*Ziziphus mauritina L*)
DENGAN PELARUT N – HEKSAN DALAM MENURUNKAN BAKTERI
COLIFORM PADA AIR BERSIH

xiv + 86 Halaman + 18 Tabel + 5 Lampiran

Berdasarkan data Statistik Lingkungan Hidup Indonesia Tahun 2024 sekitar 28 juta penduduk Indonesia mengalami kesulitan akses air bersih dan lebih dari 70% rumah tangga mengonsumsi air terkontaminasi bakteri *coliform* yang menyebabkan masalah kesehatan bagi manusia sehingga diperlukan proses desinfeksi pada pengolahan air bersih. Penggunaan desinfektan kimia menghasilkan produk samping berupa trihalometana (THM) yang bersifat karsinogenik. Dengan demikian, eksperimen ini dilaksanakan guna menganalisis efektivitas ekstrak daun bidara arab (*Ziziphus mauritiana L.*) dengan pelarut n-heksan sebagai desinfektan alami guna meminimalisir populasi bakteri *coliform* dalam air bersih.

Eksperimen ini tergolong penelitian eksperimen murni (*True Experiment*) yang menerapkan desain rancangan *Response Surface Methodology* (RSM). Variabel independen dalam penelitian yakni konsentrasi ekstrak (5% v/v, 10% v/v, 15% v/v) dan waktu kontak (20, 30, 40 menit). Variabel dependen dalam penelitian adalah kandungan bakteri *coliform*. Pengolahan data dilakukan melalui analisis statistik regresi liner berganda.

Temuan studi ini mengindikasikan bahwa ekstrak daun bidara arab menggunakan pelarut n – heksan memiliki senyawa aktif saponin dan tanin yang berfungsi sebagai antibakteri. Penurunan tertinggi dicapai pada konsentrasi 15% v/v dengan waktu kontak 40 menit menunjukkan sisa bakteri 11 CFU/ml, sedangkan titik optimum berdasarkan analisis RSM tercapai pada konsentrasi 15% v/v dan waktu kontak 37 menit dengan hasil 8 CFU/ml.

Ekstrak daun bidara arab dengan pelarut n – heksan terbukti mengandung senyawa antibakteri yang mampu meminimalkan jumlah bakteri *coliform* pada air bersih. Temuan eksperimen ini, membuktikan bahwa ekstrak daun bidara arab dapat berpotensi sebagai desinfektan alami pada proses pengolahan air bersih.

Kata kunci : Ekstrak daun bidara arab, Bakteri *Coliform*, Desinfektan alami,
Response Surface Methodology

Daftar bacaan: 5 buku (2009-2022) + 38 Jurnal (2019-2025)

ABSTRACT

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EFFECTIVENESS OF ARAB BIDARA (Ziziphus mauritiana L) LEAVES EXTRACT WITH N- HEKSAN SOLUTION IN REDUCING COLIFORM BACTERIA IN CLEAN WATER

xiv + 86 Pages + 18 Tables + 5 Appendices

Based on data from the Indonesian Environmental Statistics Year 2024, around 28 million Indonesians had difficulty accessing clean water and more than 70% of households consumed water contaminated with coliform bacteria, which caused health problems for humans so that a disinfection process was needed in clean water treatment. The use of chemical disinfectants produced by-products in the form of trihalomethane (THM) which is carcinogenic. Therefore, this study aimed to analyze the effectiveness of bidara arabic (Ziziphus mauritiana L.) leaf extract with n-hexane solvent as a natural disinfectant in reducing the number of coliform bacteria in clean water.

This research was a pure experimental research (True Experiment) that used Response Surface Methodology (RSM) design. The independent variables in the study were extract concentration (5% v/v, 10% v/v, 15% v/v) and contact time (20, 30, 40 minutes). The dependent variable in the study was the content of coliform bacteria. Multiple linear regression techniques were applied for statistical data assessment.

The results showed that bidara arabic leaf extract using n-hexane solvent contained active compounds of saponins and tannins that functioned as antibacterial agents. The highest reduction was achieved at a concentration of 15% v/v with a contact time of 40 minutes, showing residual bacteria of 11 CFU/ml, while the optimum point based on RSM analysis was reached at a concentration of 15% v/v and a contact time of 37 minutes with a result of 8 CFU/ml.

Arabic bidara leaf extract with n-hexane solvent was proven to contain antibacterial compounds that could reduce coliform bacteria in clean water. The results of this study proved that bidara arabic leaf extract could have potential as a natural disinfectant in the clean water treatment process.

Keywords : Bidara Arabic Leaf Extract, Coliform Bacteria, Natural Disinfectant, Response Surface Methodology

References: 5 books (2009-2022) +38 Journal (2019-2025)