

FAKULTAS KEDOKTERAN

UNIVERSITAS PEMBANGUNAN NASIONAL “VETERAN” JAKARTA

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**ISOLASI DAN UJI AKTIVITAS ANTIBAKTERI ISOLAT BAKTERI
ENDOFIT AKAR PATIKAN KEBO (*Euphorbia hirta* L.) TERHADAP
BAKTERI *Escherichia coli* & *Staphylococcus aureus***

RINCIAN HALAMAN (xxii + 136 halaman, 14 tabel, 28 gambar, 6 lampiran)

ABSTRAK

Tujuan

Tanaman patikan kebo (*Euphorbia hirta* L.) dikenal sebagai tanaman obat yang berpotensi menghasilkan senyawa antibakteri, salah satunya melalui keberadaan bakteri endofit yang hidup di dalam jaringan tanaman. Pemanfaatan bakteri endofit dari tanaman sebagai agen antibakteri masih terbatas, sehingga penelitian ini bertujuan untuk mengetahui karakteristik serta aktivitas antibakteri isolat bakteri endofit yang diisolasi dari akar tanaman patikan kebo (*Euphorbia hirta* L.), terhadap bakteri uji *Escherichia coli* dan *Staphylococcus aureus*.

Metode

Penelitian dilakukan secara eksperimental laboratorik. Isolasi bakteri endofit dilakukan dari sampel akar *Euphorbia hirta* L. yang telah melalui proses sterilisasi permukaan. Isolat yang diperoleh dikarakterisasi secara fenotipik meliputi morfologi koloni, pewarnaan Gram, katalase, pewarnaan endospora, dan uji biokimia. Skrining awal aktivitas antibakteri dilakukan menggunakan metode *cross streak*, kemudian isolat terpilih diuji lebih lanjut menggunakan metode difusi cakram terhadap bakteri uji *Escherichia coli* dan *Staphylococcus aureus*.

Hasil

Sebanyak 26 isolat bakteri endofit berhasil diisolasi dari akar *Euphorbia hirta* L. Hasil skrining awal menunjukkan delapan isolat memiliki potensi antibakteri. Hasil pewarnaan Gram terhadap isolat potensial tersebut menunjukkan dominasi bakteri Gram positif sebanyak tujuh isolat (87,5%) dan satu isolat Gram negatif (12,5%). Karakterisasi fenotipik menunjukkan tujuh isolat memiliki kemiripan dengan genus *Bacillus* dan satu isolat menunjukkan karakteristik menyerupai *Pseudomonas*. Aktivitas antibakteri bervariasi antar isolat, dengan daya hambat tertinggi terhadap

Staphylococcus aureus sebesar 19,35 mm dan terhadap *Escherichia coli* sebesar 5,32 mm.

Kesimpulan

Bakteri endofit yang diisolasi dari akar tanaman patikan kebo (*Euphorbia hirta* L.) memiliki keragaman fenotip dan menunjukkan potensi aktivitas antibakteri, khususnya terhadap *Staphylococcus aureus*, sehingga berpotensi dikembangkan sebagai sumber agen antibakteri alami.

Daftar Pustaka : 78 (1994-2025)

Kata Kunci : antibakteri; bakteri endofit; *Bacillus*; *Escherichia coli*; *Euphorbia hirta* L.; fenotip; *Staphylococcus aureus*; tanaman obat

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***ISOLATION AND EVALUATION OF ANTIBACTERIAL ACTIVITY OF
ENDOPHYTIC BACTERIA ISOLATED FROM THE ROOTS *Euphorbia hirta* L.
AGAINST *Escherichia coli* AND *Staphylococcus aureus****

PAGE DETAIL (xxii + 136 pages, 14 tables, 28 pictures, 6 appendices)

ABSTRACT

Objective

*Euphorbia hirta L. is known as a medicinal plant with potential antibacterial properties, one of which is associated with the presence of endophytic bacteria living within plant tissues. However, the utilization of endophytic bacteria from plants as antibacterial agents remains limited. Therefore, this study aims to determine the characteristics and antibacterial activity of endophytic bacterial isolates isolated from the roots of patikan kebo (*Euphorbia hirta L.*) against the test bacteria *Escherichia coli* and *Staphylococcus aureus*.*

Method

*This research was conducted using an experimental laboratory design. Isolation of endophytic bacteria was carried out from root samples of *Euphorbia hirta L.* that had undergone surface sterilization. The obtained isolates were phenotypically characterized including colony morphology, Gram staining, catalase test, endospore staining, and biochemical tests. Preliminary screening of antibacterial activity was performed using the cross streak method, followed by further testing of selected isolates using the disc diffusion method against the test bacteria *Escherichia coli* and *Staphylococcus aureus*.*

Results

*A total of 26 endophytic bacterial isolates were successfully isolated from the roots of *Euphorbia hirta L.* Preliminary screening results showed that eight isolates had antibacterial potential. Gram staining of the potential isolates showed a predominance of Gram-positive bacteria, with seven isolates (87.5%) classified as Gram-positive and one isolate (12.5%) as Gram-negative. Phenotypic characterization showed that seven isolates had similarities to the genus *Bacillus* and one isolate showed characteristics resembling *Pseudomonas*. Antibacterial activity varied among isolates, with the*

highest inhibition against Staphylococcus aureus of 19.35 mm and against Escherichia coli of 5.32 mm.

Conclusion

Endophytic bacteria isolated from the roots of patikan kebo (Euphorbia hirta L.) have phenotypic diversity and show potential antibacterial activity, particularly against Staphylococcus aureus, so that they have the potential to be developed as a source of natural antibacterial agents.

Reference : 78 (1994-2025)

Keyword : antibacterial; Bacillus; endophytic bacteria; Escherichia coli; Euphorbia hirta L.; phenotypic; Staphylococcus aureus; medicinal plant