

**ISOLASI DAN IDENTIFIKASI BAKTERI ENDOFUNGAL JAMUR  
TIRAM (*Pleurotus ostreatus*) DAN POTENSINYA SEBAGAI  
ANTIMIKROBA**

**SKRIPSI**

Diajukan sebagai salah satu syarat untuk memperoleh gelar Sarjana Sains  
Program Studi Biologi



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**PROGRAM STUDI BIOLOGI  
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM  
UNIVERSITAS PENDIDIKAN INDONESIA  
BANDUNG  
2024**

**LEMBAR HAK CIPTA**

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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Agustus 2024

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## LEMBAR PERNYATAAN

*Dengan ini saya menyatakan bahwa skripsi yang berjudul, “ISOLASI DAN IDENTIFIKASI BAKTERI ENDOFUNGAL JAMUR TIRAM (*Pleurotus ostreatus*) DAN POTENSINYA SEBAGAI ANTIMIKROBA” ini beserta seluruh isinya adalah benar-benar karya saya sendiri dan saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan tersebut, saya siap menanggung risiko yang dijatuhkan kepada saya apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan dalam karya ini, atau ada klaim dari pihak lain terhadap keaslian karya saya.*

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## KATA PENGANTAR

Puji syukur penulis panjatkan Kepada Tuhan Pemilik seluruh alam. Allah SWT. yang hanya milik-Nya semata segala pujian berhak untuk dipanjatkan. Berkat rahmat dan karunia-Nya penulis berhasil menyelesaikan sebuah skripsi berjudul **“ISOLASI DAN IDENTIFIKASI BAKTERI ENDOFUNGAL JAMUR TIRAM (*Pleurotus ostreatus*) DAN POTENSINYA SEBAGAI ANTIMIKROBA”**. Adapun tujuan disusunnya skripsi ini untuk memberi kebermanfaatan kepada masyarakat lewat penelitian yang telah dilakukan serta disusun dalam laporan tertulis ini, serta untuk memenuhi salah satu syarat sidang skripsi Program Studi Biologi Universitas Pendidikan Indonesia.

Tidak pernah ada perjalanan yang mulus dalam menjalani kehidupan sebab pada dasarnya, hidup adalah perjuangan. Sama halnya dengan proses penyusunan skripsi ini. Banyak sekali hambatan yang telah dilalui dalam proses penelitian hingga penulisan skripsi. Namun, berkat dukungan dan doa dari berbagai pihak, pada akhirnya skripsi ini bisa selesai sebagai buah manis dari semua perjuangan yang telah dilalui.

Penulis menyadari bahwa dalam perjalanan panjang penyusunan skripsi ini tidak terlepas dari bantuan, dukungan, serta doa berbagai pihak. Penulis ingin menyampaikan beribu terima kasih yang mungkin tidak akan mampu terdefiniskan dalam kata-kata kepada seluruh pihak yang telah berperan serta dalam penyelesaian skripsi ini. Dengan segala hormat penulis ucapkan terima kasih kepada:

1. Bapak Dr. Wahyu Surakusumah, M.T., selaku Ketua Program Studi Biologi.
2. Ibu Dr. Hj. Any Fitriani, M.Si. selaku Dosen Pembimbing 1 yang telah meluangkan pikiran, tenaga, dan waktu untuk membimbing penulis dengan sepenuh hati dalam menyelesaikan skripsi ini.
3. Ibu Dr. Hj. Peristiwa, M.Kes., selaku Dosen Pembimbing II yang telah meluangkan pikiran, tenaga, dan waktu untuk membimbing penulis dengan sepenuh hati dalam menyelesaikan Skripsi.
4. Ibu Dr. Hernawati, M.Si., S.Pt., selaku dosen pembimbing akademik yang telah membantu dan membimbing selama masa perkuliahan.

5. Seluruh Bapak dan Ibu dosen Program Studi Biologi yang telah memberikan ilmu dan pengalamannya kepada penulis selama perkuliahan.
6. Kepada Ayah, Asep Hadits Fallaq dan Ibu, Nining Ratna Ningsih yang doanya selalu menyertai dengan penuh ketulusan dan kasih sayang, serta seluruh dukungan yang selalu diberikan baik dukungan moril maupun materil.
7. Kepada Haura Nurbani Saefullah, sahabat yang memainkan banyak peran penting dalam penelitian ini di antaranya sebagai investor, psikolog, ahli gizi, dan masih banyak peran lainnya.
8. Seluruh kawan-kawan di Unit Pers Mahasiswa Isolapos UPI yang telah memberikan banyak pelajaran berharga selama penyusunan skripsi ini, terutama kepada Nabil, Wulan, dan Rachma.
9. Kawan-kawan lab riset yang telah menemani seluruh suka-duka selama penelitian berlangsung
10. Serta tak lupa kepada kawan-kawan Biologi C 2020 yang menemani dan berjuang bersama hingga akhir proses penulisan ini.

Penulis menyadari bahwa masih banyak kekurangan dalam skripsi ini karena pada hakikatnya kesempurnaan hanyalah milik Tuhan. Oleh karena itu, kritik dan saran yang membangun sangat penulis harapkan. Akhir kata, semoga skripsi ini dapat bermanfaat khususnya bagi penulis dan umumnya bagi pembaca.

Bandung, Agustus 2024

Razib Ikbal Alfaris

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**ABSTRAK**

Masalah penyakit akibat bakteri *Escherichia coli* dan fungi *Candida albicans* terjadi cukup luas dengan fenomena resistensi patogen tersebut terhadap pengobatan yang sudah umum menyebabkan perlu ditemukan alternatif lain. Bakteri endofungal telah banyak dimanfaatkan sebagai penghasil senyawa antibakteri. Kemudahan produksi serta harga ekonomis dan inang yang mudah didapat mendorong dilakukannya pengujian aktivitas antimikroba dari ekstrak bakteri endofungal jamur tiram (*Pleurotus ostreatus*) terhadap *E. coli* dan *C. albicans*. Penelitian didahului dengan isolasi bakteri endofungal jamur tiram, identifikasi sampai tingkat genus, seleksi isolat potensial penghasil senyawa antimikroba, pengukuran kurva tumbuh, ekstraksi, lalu pengujian aktivitas antimikroba. Pengujian aktivitas antimikroba dilakukan dengan uji DDA, MIC, dan MBC dengan perlakuan konsentrasi ekstrak yaitu 40,0 mg/ml, 10,0 mg/ml, dan 2,5 mg/ml dengan kontrol positif berupa ampicillin 50 µg/ml untuk *E. coli* dan ketoconazole 30 mg/ml untuk *C. albicans*, serta kontrol negatif berupa DMSO 10%. Hasil identifikasi menunjukkan sebanyak enam isolat memiliki karakteristik mendekati genus *Bacillus*, empat isolat mendekati *Acinetobacter*, dua isolat mendekati *Neisseria*, dan masing-masing satu isolat mendekati *Pseudomonas* dan *Lactobacillus*. Diameter zona hambat ekstrak supernatan isolat bakteri endofungal yang berbeda signifikan terhadap *E. coli* dihasilkan sebanyak dua isolat bakteri pada konsentrasi 40,0 mg/ml. Sementara itu, terdapat empat isolat bakteri yang memiliki daya hambat signifikan terhadap *C. albicans* pada konsentrasi 40,0 mg/ml. Hasil uji MIC dan MBC dari semua ekstrak supernatan bakteri menunjukkan nilai konsentrasi MIC dan MBC yang sejalan dengan hasil uji DDA. Dari hasil penelitian terbukti bahwa ekstrak metabolit isolat bakteri endofungal *P. ostreatus* memiliki aktivitas antimikroba terhadap *E. coli* dan *C. albicans*.

**Kata kunci:** antimikroba, bakteri endofungal, *Candida albicans*, *Escherichia coli*, *Pleurotus ostreatus*.

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**ABSTRACT**

The disease problems caused by *Escherichia coli* and *Candida albicans* are quite widespread, with the phenomenon of resistance of these pathogens to common treatments, making it necessary to find other alternatives. Endofungal bacteria have been widely used as producers of antibacterial compounds. The ease of production, economical price, and availability of hosts encouraged testing the antimicrobial activity of the endofungal bacterial extract of oyster mushrooms (*Pleurotus ostreatus*) against *E. coli* and *C. albicans*. The research was proceeded by the isolation of oyster mushroom endofungal bacteria, identification to genus level, selection of potential isolates producing antimicrobial compounds, measurement of growth curves, extraction, and testing of antimicrobial activity. Antimicrobial activity testing was carried out using the DDA, MIC, and MBC tests with treatment extract concentrations of 40.0 mg/ml, 10.0 mg/ml, and 2.5 mg/ml with a positive control in the form of ampicillin 50 µg/ml for *E. coli* and ketoconazole 30 mg/ml for *C. albicans*, as well as a negative control in the form of 10% DMSO. The identification results showed that six isolates had characteristics close to the *Bacillus* genus, four isolates were close to *Acinetobacter*, two isolates were close to *Neisseria*, and one isolate each was close to *Pseudomonas* and *Lactobacillus*. The diameter of the inhibition zone of the supernatant extract of endofungal bacterial isolates which was significantly different from *E. coli* resulted in two bacterial isolates at concentration of 40.0 mg/ml. Meanwhile, four bacterial isolates had significant inhibitory power against *C. albicans* at a concentration of 40.0 mg/ml. The MIC and MBC test results of all bacterial supernatant extracts showed concentration values were in line with the DDA test results. From the research results, it was proven that the metabolite extract of the endofungal bacterial isolate *P. ostreatus* had antimicrobial activity against *E. coli* and *C. albicans*.

**Keywords:** antimicrobial, *Candida albicans*, endofungal bacteria, *Escherichia coli*, *Pleurotus ostreatus*.



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