

**ISOLASI JAMUR ENDOFIT DARI TANAMAN BETADIN (*Jatropha multifida* L.) DAN UJI AKTIVITAS ANTIBAKTERI**

**Oleh :**



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## ABSTRAK

### ISOLASI JAMUR ENDOFIT DARI TANAMAN BETADIN (*Jatropha multifida* L.) DAN UJI AKTIVITAS ANTIBAKTERI

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Resistensi antibakteri merupakan salah satu masalah kesehatan global sehingga penyakit infeksi tertentu sulit disembuhkan dengan antibiotik yang tersedia. Penelitian ini bertujuan untuk menemukan antibakteri baru yang diproduksi oleh jamur endofit dari tanaman betadin (*Jatropha multifida* L.). Isolasi jamur endofit dilakukan dari akar, batang, daun, dan buah tanaman betadin asal Padang, Sumatera Barat menggunakan metode tanam langsung dan metode tuang. Jamur endofit yang diisolasi kemudian dikultivasi pada media beras dan diekstraksi menggunakan pelarut etil asetat. Skrining aktivitas antibakteri ekstrak etil asetat jamur endofit menggunakan metode difusi agar terhadap *Staphylococcus aureus*, *Escherichia coli*, dan Methicillin-Resistance *S. aureus* (MRSA). Isolat Jamur dengan aktivitas yang baik diidentifikasi menggunakan metode makroskopis, mikroskopis dan molekuler. Pada penelitian ini diperoleh 14 jamur endofit. Hasil skrining aktivitas antibakteri menunjukkan ekstrak etil asetat isolat jamur JMB4 dan JMD3 memiliki aktivitas yang terbaik pada konsentrasi 5%. Isolat jamur JMB4 menghambat pertumbuhan *S. aureus* dan MRSA dengan diameter hambat masing-masing sebesar  $21,79 \pm 0,31$  mm dan  $22,55 \pm 0,71$  mm. Isolat jamur JMD3 menghambat pertumbuhan *S. aureus* dan MRSA dengan diameter hambat masing-masing sebesar  $23,19 \pm 0,58$  mm dan  $23,37 \pm 0,77$  mm. Berdasarkan hasil pemeriksaan fitokimia diketahui bahwa ekstrak etil asetat isolat jamur JMB4 dan JMD3 mengandung senyawa alkaloid, flavonoid, steroid, terpenoid, dan fenolik. Hasil identifikasi molekuler menunjukkan jamur JMB4 identik 100% dengan *Fusarium incarnatum* dan isolat jamur JMD3 mirip 99,09% dengan *Fusarium oxysporum*. Dari penelitian ini dapat disimpulkan bahwa tanaman betadin merupakan sumber jamur endofit potensial dalam menghasilkan senyawa antibakteri sehingga jamur endofit JMB4 dan JMD3 perlu diteliti lanjut dalam memperoleh senyawa metabolit sekunder yang potensial sebagai antibakteri.

Kata Kunci: Jamur endofit, *Jatropha multifida*, antibakteri, *Fusarium incarnatum*, *Fusarium oxysporum*.

## ABSTRACT

### ISOLATION OF ENDOPHYTIC FUNGI FROM BETADIN PLANT (*Jatropha multifida* L.) AND EVALUATION ANTIBACTERIAL ACTIVITY

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Antibacterial resistance is a worldwide health issue, making it challenging to treat certain infectious diseases using conventional antibiotics. This study aims to discover novel antibacterial compounds synthesized by endophytic fungi found in betadin plants (*Jatropha multifida* L.). The direct planting and pouring methods were employed to isolate endophytic fungi from the roots, stems, leaves, and fruit of betadin plants from Padang, West Sumatra. The isolated endophytic fungi were subsequently cultivated on rice media and extracted using ethyl acetate solvent. The agar diffusion method was employed to screen the antibacterial activity of ethyl acetate extract of endophytic fungi against *Staphylococcus aureus*, *Escherichia coli*, and Methicillin-Resistance *S. aureus* (MRSA). Macroscopic, microscopic, and molecular techniques were employed to identify the fungal isolates with highest antibacterial activity. Fourteen endophytic fungi were identified in this investigation. The ethyl acetate extract of JMB4 and JMD3 fungal isolates exhibited the highest antibacterial activity at a concentration of 5%, as indicated by the antibacterial activity screening results. The growth of *S. aureus* and MRSA was inhibited by the JMB4 fungal isolate, with inhibitory diameters of  $21.79 \pm 0.31$  mm and  $22.55 \pm 0.71$  mm, respectively. The growth of *S. aureus* and MRSA was inhibited by the JMD3 fungal isolate, with inhibitory diameters of  $23.19 \pm 0.58$  mm and  $23.37 \pm 0.77$  mm, respectively. The ethyl acetate extract of JMB4 and JMD3 fungal isolates is known to contain alkaloids, flavonoids, steroid, terpenoids, and phenolic compounds, as indicated by the results of the phytochemical examination. According to the analysis, the JMB4 fungus was 100% identical to *Fusarium incarnatum*, and the JMD3 fungal isolate was 99.09% similar to *Fusarium oxysporum*. This research has concluded that betadin plants are a potential source of endophytic fungi that produce antibacterial compounds. As a result, further research is necessary to identify secondary metabolite compounds that have the potential to function as antibacterials in the endophytic fungi JMB4 and JMD3.

**Keywords:** Endophytic fungi, *Jatropha multifida*, antibacterials, *Fusarium incarnatum*, *Fusarium oxysporum*