

ABSTRAK

AKTIVITAS ANTIBAKTERI EKSTRAK ETIL ASETAT FUNGI ENDOFITIK SIMBION NUDIBRANCHIA TERHADAP

Escherichia coli

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Latar belakang: Kasus *multiple antibiotic resistances Escherichia coli* menjadi salah satu ancaman kesehatan masyarakat utama saat ini. Senyawa bioaktif yang dihasilkan oleh fungi yang berasosiasi dengan invertebrata laut seperti *algae*, *sponge* dan *mangrove* telah menunjukkan potensi aktivitas farmakologis dan memiliki metabolit serupa yang dihasilkan oleh inangnya. Penelitian ini bertujuan untuk mengidentifikasi morfologi fungi endofitik dari Nudibranchia, mengevaluasi aktivitas antibakteri terhadap *E. coli* dan skrining fitokimia untuk mengidentifikasi golongan metabolit sekunder.

Metodologi: Fungi endofitik diinokulasi pada media PDA hingga diperoleh fungi tunggal dan murni, selanjutnya diidentifikasi morfologi secara makroskopik dan mikroskopik. Fermentasi fungi dilakukan pada media beras selama 22 hari, kemudian fungi dimaserasi menggunakan etil asetat dengan shaker selama 24 jam. Ekstrak etil asetat fungi lalu diuji aktivitas antibakteri terhadap *E. coli* dengan metode difusi cakram Kirby-Bauer. Selain itu, dilakukan skrining fitokimia dengan uji pereaksi warna untuk mengetahui ada tidaknya beberapa golongan metabolit sekunder.

Hasil: Fungi endofitik yang diisolasi dari Nudibranchia teridentifikasi secara morfologi sebagai *Aspergillus* sp. (kode 3A) dan *Penicillium* sp. (kode 5A-1). Ekstrak etil asetat *Aspergillus* sp. menunjukkan diameter zona hambat sebesar 1 mm dan *Penicillium* sp. sebesar 1,92 mm. Hal ini menandakan bahwa ekstrak tersebut memiliki aktivitas antibakteri terhadap *E. coli* namun dikategorikan lemah. Hasil skrining fitokimia *Aspergillus* sp. positif mengandung fenol dan flavonoid, sedangkan *Penicillium* sp. hanya memiliki senyawa fenol saja.

Kesimpulan: Ekstrak etil asetat dua fungi endofitik yang diisolasi Nudibranchia mengandung senyawa fenol atau flavonoid dengan aktivitas antibakteri *E. coli* yang termasuk kategorikan lemah.

Kata kunci: Antibakteri, *Aspergillus* sp., fungi endofitik, *Escherichia coli*, *Penicillium* sp.

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ABSTRACT

ANTIBACTERIAL ACTIVITY ETHYL ACETATE EXTRACT OF ENDOPHYTIC FUNGI ASSOCIATED WITH NUDIBRANCHIA AGAINST *Escherichia coli*

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Background: The case of multiple antibiotic resistance *Escherichia coli* is one of the main public health threats today. Bioactive compounds produced by fungi associated with marine invertebrates such as *algae*, *sponges* and *mangroves* have demonstrated potential pharmacological activity and possess similar metabolites produced by their hosts. This study aims to identify the morphology of endophytic fungi from Nudibranchia, evaluate antibacterial activity against *E. coli* and screen phytochemicals to identify secondary metabolite groups.

Methodology: Endophytic fungi were inoculated on PDA media until single and pure fungi were obtained, then the morphology was identified macroscopically and microscopically. Fungi were cultivated on rice media for 22 days, then the fungi were macerated using ethyl acetate through shaking for 24 hours. The ethyl acetate extracts were then tested for antibacterial activity against *E. coli* using the Kirby-Bauer disk diffusion method. In addition, phytochemical screening was performed using a color reagent test to determine the presence or absence of secondary metabolites.

Results: The endophytic fungi isolated from Nudibranchia were identified morphologically as *Aspergillus* sp. (code 3A) and *Penicillium* sp. (code 5A-1). Ethyl acetate extracts of *Aspergillus* sp. showed an inhibition zone diameter by 1 mm and of *Penicillium* sp. by 1.92 mm. This indicates that the extract has antibacterial activity against *E. coli* but is categorized as weak. The phytochemical screening of *Aspergillus* sp. possessed phenols and flavonoids contents, while *Penicillium* sp. only contained phenolic compounds.

Conclusion: Ethyl acetate extracts of two endophytic fungi isolated from Nudibranchia possessing phenol or flavonoids revealed mild antibacterial activity against *E. coli*.

Key words: Antibacterial, *Aspergillus* sp., endophytic fungi, *Escherichia coli*, *Penicillium* sp.

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