SKRINING AKTIVITAS ANTIBAKTERI EKSTRAK ETIL ASETAT ISOLAT JAMUR ENDOFIT ALGA COKLAT (*Turbinaria ornata*) TERHADAP *Escherichia coli* ATCC 25922 DAN *Staphylococcus aureus* ATCC 6538

ABSTRAK

Penyakit infeksi adalah salah satu masalah kesehatan global terbesar. Pengobatan penyakit infeksi menggunakan antibiotik, saat ini banyak kasus bakteri yang resisten. Oleh karena itu, diperlukan pencarian senyawa antibiotik baru dengan cara pemanfaatan sumber bahan alam. Seperti alga coklat (*Turbinaria ornata*) yang berpotensi menghasilkan senyawa antibakteri. Alternatif lain untuk memaksimalkan pemanfaatan tanaman tersebut dengan memanfaatkan jamur endofit, yang hidup di dalam jaringan tanaman dan berpotensi menghasilkan senyawa metabolit sekunder yang sama seperti inangnya. Penelitian ini bertujuan mengisolasi jamur endofit, mengetahui aktivitasnya terhadap *Escherichia coli* ATCC 25922 dan *Staphylococcus aureus* ATCC 6538, mengetahui golongan senyawa metabolit sekunder alga coklat. Jamur diisolasi menggunakan metode tanam dan tuang, didapatkan 4 isolat jamur endofit dan dikultivasi pada media beras. Ektraksi dilakukan dengan metode maserasi dengan pelarut etil asetat. Uji aktivitas antibakteri menggunakan metode difusi cakram, hasil penelitian menunjukkan bahwa isolat E1 memiliki aktivitas antibakteri kategori kuat dengan zona hambat rata-rata 11,10 mm terhadap *S. aureus* ATCC 6538 dan tidak aktif terhadap *E. coli* ATCC 25922. Penentuan Konsentrasi Hambat Minimum (KHM) menggunakan metode mikrodilusi menunjukkan nilai KHM 500 µg/mL pada bakteri *S. aureus* ATCC 6538. Uji fitokimia menunjukkan adanya senyawa alkaloid, fenolik, flavonoid, dan terpenoid/steroid. Perbedaan aktivitas ini karena perbedaan struktur dinding sel bakteri Gram positif dan Gram negatif. Hasil ini menunjukkan bahwa jamur endofit alga coklat berpotensi sebagai sumber senyawa antibakteri alami dan dapat dikembangkan lebih lanjut, dalam penemuan antibiotik baru.

Kata kunci: Jamur endofit, Alga coklat (*Turbinaria ornata*), Antibakteri, *Escherichia coli*, *Staphylococcus aureus*, KHM

SCREENING OF THE ANTIBACTERIAL ACTIVITY OF ETHYL ACETATE EXTRACTS FROM ENDOPHYTIC FUNGAL ISOLATES OF BROWN ALGAE (*Turbinaria ornata*) AGAINST *Escherichia coli* ATCC 25922 AND *Staphylococcus aureus* ATCC 6538

ABSTRACT

Infectious diseases are one of the biggest global health issues. The treatment of infectious diseases using antibiotics is currently facing many cases of bacterial resistance. Therefore, it is necessary to search for new antibiotic compounds by utilizing natural sources. Such as brown algae (*Turbinaria ornata*), which has the potential to produce antibacterial compounds. Another alternative to maximize the utilization of this plant is by utilizing endophytic fungi, which live within plant tissues and have the potential to produce secondary metabolites similar to their host. This study aims to isolate endophytic fungi, determine their activity against *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 6538, and to identify the class of secondary metabolites in brown algae. The fungi were isolated using the inoculation and pour plate methods, resulting in 4 endophytic fungal isolates which were cultured on rice medium. Extraction was performed using the maceration method with ethyl acetate as the solvent. Antibacterial activity testing was conducted using the disk diffusion method, and the results showed that isolate E1 exhibited strong antibacterial activity with an average inhibition zone of 11.10 mm against *S. aureus* ATCC 6538 and was inactive against *E. coli* ATCC 25922. The determination of the Minimum Inhibitory Concentration (MIC) using the microdilution method showed an MIC value of 500 µg/mL against *S. aureus* ATCC 6538. Phytochemical testing revealed the presence of alkaloids, phenolics, flavonoids, and terpenoids/steroids. This difference in activity is due to the structural differences in the cell walls of Gram positive and Gram negative bacteria. These results indicate that brown algae endophytic fungi have potential as a source of natural antibacterial compounds and can be further developed in the discovery of new antibiotics.

Keywords: Endophytic fungi, Brown algae (*Turbinaria ornata*), Antibacterial, *Escherichia coli*, *Staphylococcus aureus*, KHM