

ABSTRAK

ISOLASI DAN KARAKTERISASI SENYAWA BIOAKTIF FUNGI ENDOFIT MANGROVE SERTA UJI BIOAKTIVITASNYA SEBAGAI ANTIBAKTERI TERHADAP BAKTERI PATOGEN

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Penelitian ini dilatar belakangi oleh adanya fenomena infeksi yang disebabkan bakteri yang resisten terhadap berbagai antibiotik. Penelitian ini bertujuan untuk memperoleh senyawa bioaktif yang berasal dari fungi endofit mangrove yang berpotensi sebagai antibakteri. Isolat fungi dari endofit mangrove diuji aktivitas antibakteri menggunakan metode difusi agar *ring* dan analisis karakteristik senyawa menggunakan LC-MS/MS dan FTIR. Fungi endofit mangrove diremajakan menggunakan media agar koloid kitin hingga mendapatkan isolat murni. Isolat dikultivasi menggunakan metode OSMAC dengan 3 media berupa kulit udang, beras, dan kentang. Kultur diekstraksi menggunakan etil asetat. Ekstrak kasar diuji bioaktivitasnya sebagai antibakteri terhadap bakteri patogen *S.aureus* dan *P.aeruginosa*. Ekstrak kasar isolat potensial diuji bioautografi kontak. Fraksinasi dilakukan menggunakan kromatografi kolom dan diuji aktivitas antibakterinya dengan bioautografi *overlay*. Fraksi aktif selanjutnya dikarakterisasi menggunakan LC-MS/MS dan FTIR. Sebanyak 6 isolat fungi endofit yang telah diremajakan terindikasi genus *Aspergillus* dan *Acremonium*. Skrining antibakteri dari keenam isolat menunjukkan isolat 21BC3-LRB memiliki daya hambat yang paling besar terhadap *S.aureus* dan isolat 21BC2-LRKU terhadap *P.aeruginosa*. Karakteristik senyawa yang dihasilkan fraksi 21BC2-LRKU1 menunjukkan adanya senyawa alkaloid dengan struktur dasar pirolidin dan terdapat beberapa gugus fungsi antara lain gugus C – H, gugus C=O, gugus N – H, dan gugus C – N tersier.

Kata kunci : Fungi endofit mangrove, kitin, antibakteri

ABSTRACT

ISOLATION AND CHARACTERIZATION OF BIOACTIVE COMPOUNDS OF MANGROVE ENDOPHYT FUNGI AND TESTING THEIR BIOACTIVITY AS ANTIBACTERIAL AGAINST PATHOGEN BACTERIA

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The rising prevalence of antibiotic-resistant bacterial infections underscores the urgent need for alternative therapeutic agents. This study focuses on harnessing the potential of bioactive compounds from mangrove endophytic fungi with antibacterial properties. Fungal isolates obtained from mangrove endophytes underwent antibacterial testing using the agar ring diffusion method. Compound characteristics were analyzed using LC-MS/MS and FTIR. Rejuvenation of mangrove endophytic fungi involved the use of colloidal chitin agar media to obtain pure isolates. The OSMAC method, employing shrimp shells, rice, and potatoes as media, was used for isolate cultivation. Ethyl acetate was employed for culture extraction. Crude extracts were evaluated for antibacterial activity against pathogenic bacteria, specifically *S. aureus* and *P. aeruginosa*, using the agar well diffusion method. Bioactivity was further confirmed through contact bioautography. Column chromatography facilitated fractionation, and overlay bioautography assessed antibacterial activity of fractions. The active fraction was characterized using LC-MS/MS and FTIR. Among the rejuvenated isolates, six were identified as belonging to the genera *Aspergillus* and *Acremonium*. Antibacterial screening revealed that isolate 21BC3-LRB exhibited significant inhibition against *S. aureus*, while isolate 21BC2-LRKU demonstrated notable activity against *P. aeruginosa*. The characterization of compounds produced by the 21BC2-LRKU1 fraction indicated the presence of alkaloid compounds with a pyrrolidine basic structure. Functional groups identified included C–H, C=O, N–H, and tertiary C–N groups.

Keyword : Mangrove endophytic fungi, chitin, antibacterial