

ABSTRAK

ISOLASI DAN KARAKTERISASI SENYAWA BIOAKTIF ACTINOMYCETES SEDIMEN MANGROVE SERTA UJI AKTIVITAS ANTIBAKTERI TERHADAP *Staphylococcus aureus*

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Fenomena munculnya bakteri yang resisten terhadap antibiotik mendorong para peneliti untuk melakukan eksplorasi senyawa bioaktif baru. Penelitian ini dilakukan untuk memperoleh isolat actinomycetes dari sedimen mangrove, mengetahui aktivitasnya sebagai antibakteri melalui *microdilution*, dan mengetahui karakteristik senyawanya. Actinomycetes sedimen mangrove ditumbuhkan pada media agar koloid kitin dan dilakukan pemeliharaan hingga didapatkan biakan murni. Isolat tunggal selanjutnya dikultivasi pada media padat kulit udang sebanyak 50 g dan diinkubasi dalam kondisi statis selama 14 hari. Kultur diekstraksi menggunakan etil asetat (EtOAc). Ekstrak kasar diskriminasi aktivitas antibakterinya terhadap *S. aureus* menggunakan *microtiter plate 96-well*. Isolat potensial dikultivasi skala besar menggunakan 200 g kulit udang. Ekstrak kasar di fraksinasi melalui kromatografi kolom dan diuji aktivitas antibakterinya terhadap *S. aureus*. Fraksi aktif selanjutnya dikarakterisasi menggunakan LC-MS/MS dan FT-IR. Sampel sedimen mangrove diambil dari 3 titik di Kawasan Hutan Mangrove Sriminosari, Lampung Timur dan diperoleh sebanyak 7 isolat actinomycetes yang teridentifikasi genus *Streptomyces* dan *Planomonospora*. Skrining antibakteri dari ketujuh isolat menunjukkan isolat ISM 7 memiliki daya hambat yang paling besar terhadap *S. aureus*. Karakteristik senyawa yang dihasilkan oleh isolat potensial ISM 7 menunjukkan adanya senyawa golongan alkaloid dengan struktur dasar morfolin pada fraksi aktif ISM7K1F3 yang tersusun dari gugus fungsi O-H, C-H *stretching* alkana, C=O, C-N, C-H *bending* alkana, dan C-O.

Kata kunci: Sedimen mangrove, kitin, actinomycetes, antibakteri

ABSTRACT

ISOLATION AND CHARACTERIZATION BIOACTIVE COMPOUNDS ACTINOMYCETES MANGROVE SEDIMENT AND ANTIBACTERIAL ACTIVITY ASSAY AGAINST *Staphylococcus aureus*

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The phenomenon of emergence of bacteria that are resistant to antibiotics encourages researchers to explore new bioactive compounds. This study was conducted to obtain isolates of actinomycetes from mangrove sediment, to determine their antibacterial activity through microdilution, and to determine the characteristics of their compounds. Actinomycetes mangrove sediments were grown on colloidal chitin agar media and maintained until pure isolates were obtained. The pure isolates were cultivated on 50 g of shrimp shells solid media and incubated under static conditions for 14 days. The cultures were extracted using ethyl acetate (EtOAc). The crude extract was screened for its antibacterial activity against *S. aureus* using a 96-well microtiter plate. Potential isolate was scale up cultivated using 200 g of shrimp shells. The crude extract was fractionated by column chromatography and tested for its antibacterial activity against *S. aureus*. The active fraction was further characterized using LC-MS/MS and FT-IR. Mangrove sediment samples were taken from 3 points in the Sriminosari Mangrove Forest Area, East Lampung and obtained as many as 7 isolates of actinomycetes which indicated the genus *Streptomyces* and *Planomonospora*. Antibacterial screening of the seven isolates showed that ISM 7 isolates had the greatest inhibition against *S. aureus*. The chemical characteristics of the compounds produced by the potential isolate of ISM 7 in the active fraction ISM7K1F3 which is showed the presence of alkaloid compounds with a morpholine basic structure composed of functional groups O-H, C-H stretching alkanes, C=O, C-N, C-H bending alkanes, and C-O.

Key words: Mangrove sediment, chitin, actinomycetes, antibacterial