

ABSTRACT

THE ANTIBACTERIAL ACTIVITY OF ACTIVE COMPOUNDS IN BACTERIAL *Citromicrobium* sp. AS A SIMBION OF MANGROVE *Avicennia alba* (J.H. MAIDEN, 1904)

By

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Infections are caused by pathogenic microorganisms such as bacteria or fungi, *Staphylococcus aureus* and *Salmonella typhi*, which still pose a global public health problem. Research shows the potential of extracts or compounds from endosymbiotic microbes of mangrove plants as an alternative to synthetic antibiotics, which can lead to the production of new metabolites. The research was conducted from July to October 2022 at the Oceanography Laboratory, Department of Fisheries and Marine Sciences, Faculty of Agriculture, and Agricultural Biotechnology Laboratory, University of Lampung, with the aim of testing the antibacterial activity of the *Citromicrobium* sp. bacterial extract, identifying the active compounds contained in the bacterial extract of *Citromicrobium* sp. and analyzing the toxic properties of the bacterial extract of *Citromicrobium* sp., the mangrove symbiont of *Avicennia alba*. *Citromicrobium* sp. was cultured in NB medium for one week and then centrifuged. The bacteria were macerated using methanol as a solvent. The extracts were identified using gas chromatography-mass spectrometry (GC-MS), and toxicity tests were conducted. The results of the extract toxicity test showed an LC₅₀ value of 202.77 µg/mL. The analysis of the compounds in the methanol extract of the bacteria *Citromicrobium* sp. identified nine types of compounds. Four of these types had potential antibacterial properties, namely *hexadecanoic acid, methyl ester (palmitic acid, methyl ester)*, uniphat A60, *hexadecanoic acid (CAS) (palmitic acid, palmitinic acid)*, prifrac 2960, *1,2-benzenedicarboxylic acid, mono*, and *di-n-octyl phthalate 1,2-benzenedicarboxylic acid, dioctyl ester*.

Keywords : *Citromicrobium* sp., *S. aureus*, *S. typhi*, antibacterial

ABSTRAK

AKTIVITAS ANTIBAKTERI SENYAWA AKTIF BAKTERI *Citromicrobium* sp. SIMBION MANGROVE *Avicennia alba* (J.H. MAIDEN, 1904)

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Infeksi disebabkan oleh mikroorganisme patogen seperti bakteri atau jamur *Staphylococcus aureus* dan *Salmonella typhi* masih menjadi masalah kesehatan masyarakat global. Penelitian menunjukkan potensi ekstrak atau senyawa dari mikroba endosimbion tanaman mangrove sebagai alternatif antibiotik sintetik yang dapat menghasilkan metabolit baru. Penelitian dilakukan dari Juli hingga maret 2023 di Laboratorium Budidaya Perikanan dan Laboratorium Oseanografi, Jurusan Perikanan dan Ilmu Kelautan, Fakultas Pertanian dan Laboratorium Bioteknologi Pertanian Universitas Lampung dengan tujuan uji aktivitas antibakteri ekstrak bakteri *Citromicrobium* sp., mengidentifikasi senyawa aktif yang terkandung dalam ekstrak bakteri *Citromicrobium* sp. dan menganalisis sifat toksik ekstrak bakteri *Citromicrobium* sp. simbion mangrove *Avicennia alba*. Bakteri *Citromicrobium* sp. dibiakkan di media NB selama satu minggu dan disentrifugasi, bakteri dimaserasi menggunakan pelarut metanol. Ekstrak diidentifikasi menggunakan *gas chromatography mass spectra* (GCMS) dan uji toksisitas. Hasil uji toksisitas ekstrak menunjukkan nilai LC_{50} sebesar 202,77 $\mu\text{g} / \text{mL}$. Dari analisis senyawa dalam ekstrak metanol bakteri *Citromicrobium* sp., teridentifikasi adanya 9 jenis senyawa. Terdapat 4 jenis yang menunjukkan potensi sebagai antibakteri, yaitu *hexadecanoic acid, methyl ester (palmitic acid, methyl ester)*, *uniphat A60, hexadecanoic acid (CAS) (palmitic acid, palmitinic acid)*, *prifrac 2960, 1,2-benzenedicarboxylic acid, mono, dan di-n-octyl phthalate 1,2-benzenedicarboxylic acid, dioctyl ester*.

Kata kunci : *Citromicrobium* sp., *S. aureus*, *S. typhi*, antibakteri