ABSTRAK

Sebanyak 250.000 kejadian infeksi terjadi di Amerika setiap tahunnya, dimana 40% disebabkan oleh bakteri Gram positif dan 60% disebabkan oleh bakteri Gram negatif, sehingga meningkatkan risiko kematian hingga 20 kali. Penggunaan antibiotik yang tidak rasional akan memicu resistensi. Pencarian senyawa antibakteri baru menjadi salah satu upaya dalam menangani resistensi. Rumput laut hijau (Chlorophyta) dilaporkan memiliki senyawa antibakteri. Namun, setiap Chlorophyta memiliki variasi jenis senyawa antibakteri. Identifikasi Chlorophyta umumnya dilakukan secara morfologi, tetapi proses ini sering menimbulkan kesalahan. Identifikasi berbasis molekuler menjadi salah satu upaya dalam menangani kesalahan identifikasi. Penelitian ini bertujuan untuk mengetahui spesies, senyawa bioaktif, dan potensi antibakteri dari Chlorophyta. Pengetahuan mengenai spesies Chlorophyta diperoleh melalui pengamatan morfologi dan anatomi serta gen melalui DNA *barcoding*, sedangkan pengetahuan mengenai kandungan senyawa bioaktif diperoleh melalui instrumen LC-HRMS. Sementara itu, potensi antibakteri dari Chlorophyta diketahui melalui metode Kirby-Bauer. Hasil identifikasi dari Chlorophyta meliputi: *Cladophora* sp., *Ulva lactuca, Halicystis* sp., dan *Chaetomorpha* sp. Senyawa bioaktif yang dihasilkan oleh Chlorophyta dilaporkan memiliki fungsi di bidang kesehatan maupun pangan. Zona hambat yang terbentuk dari setiap ekstrak Chlorophyta dikategorikan lemah dengan sifat bakteriostatik terhadap bakteri *B. megaterium* DSM32, *M. luteus* ATCC4698, dan *E. coli* K12. Senyawa bioaktif yang berperan belum diketahui secara pasti, sehingga diperlukan purifikasi.

Kata Kunci: Bakteri patogen; rumput laut hijau; identifikasi molekuler; analisa senyawa bioaktif; aktivitas antibakteri

ABSTRACT

As many as 250,000 infections occur in the United States every year, of which 40% were caused by Gram-positive bacteria and 60% were caused by Gram-negative bacteria, increasing the risk of death by up to 20 times. Irrational use of antibiotics will trigger resistance. The search for new antibacterial compounds is one of the efforts to deal with resistance. Green seaweed (Chlorophyta) was reported to have antibacterial compounds. However, each Chlorophyta has a variety of types of antibacterial compounds. Chlorophyta identification is generally done morphologically, but this process often leads to errors. Molecular-based identification is one of the efforts to deal with misidentification. This study aims to determine the species, bioactive compounds, and antibacterial potential of Chlorophyta. Knowledge about Chlorophyta species was obtained through morphological and anatomical observations as well as genes through DNA barcoding, while knowledge about the content of bioactive compounds was obtained through LC-HRMS instruments. Meanwhile, the antibacterial potential of Chlorophyta was known through the Kirby-Bauer method. The identification results of Chlorophyta were included: Cladophora sp., Ulva lactuca, Halicystis sp., and Chaetomorpha sp. The bioactive compounds produced by Chlorophyta were reported to have functions in the health and food fields. The inhibitory zone formed from each Chlorophyta extract was categorized as resistant with bacteriostatic properties against B. megaterium DSM32*, M. luteus* ATCC4698*, and E. coli* K12 *bacteria. The bioactive compounds that play a role were not known for sure, so purification was recommended.*

Keywords: Pathogenic bacteria; green seaweed; molecular identification; analysis of bioactive compounds; antibacterial activity