

Intisari

AKTIVITAS PENGHAMBATAN TIROSINASE EKSTRAK ETANOL *Ulva lactuca* DAN FRAKSINYA SECARA *IN VITRO*

Ulva lactuca merupakan alga hijau yang mengandung berbagai senyawa bioaktif yang bermanfaat bagi manusia dan berbagai bidang. Penelitian ini bertujuan mengetahui aktivitas penghambatan tirosinase dan memprediksi senyawa aktif dari ekstrak etanol *Ulva lactuca* dan fraksinya. Maserasi *Ulva lactuca* menggunakan etanol serta diekstraksi cair-cair (fraksinasi) dengan pelarut n-heksana, kloroform, dan air. Ekstrak etanol dan fraksi diuji total kandungan fenolik, kandungan flavonoid, dan aktivitas penghambatan tirosinase secara *in vitro*. Ekstrak etanol dan fraksi n-heksana dengan aktivitas inhibisi tertinggi diidentifikasi kandungan senyawanya menggunakan *Gas Chromatography-Mass Spectrometry* (GC-MS). Hasil menunjukkan total kandungan fenolik yaitu fraksi n-heksana ($9,43 \pm 0,27$ mgGAE/g), ekstrak etanol ($5,48 \pm 0,16$ mgGAE/g), fraksi kloroform ($4,80 \pm 0,53$ mgGAE/g), fraksi air ($1,08 \pm 0,15$ mgGAE/g). Kandungan flavonoid yaitu fraksi n-heksana ($9,20 \pm 0,49$ mgQE/g), ekstrak etanol ($8,84 \pm 0,60$ mgQE/g), fraksi kloroform ($6,60 \pm 0,69$ mgQE/g), dan fraksi air ($1,64 \pm 0,19$ mgQE/g). Aktivitas penghambatan tirosinase paling mendekati asam kojat ($IC_{50} = 11,07 \pm 0,86$ μ g/mL) yaitu fraksi n-heksana ($IC_{50} = 127,74 \pm 6,47$ μ g/mL) dan ekstrak etanol ($IC_{50} = 148,19 \pm 3,24$ μ g/mL). Senyawa yang diduga berperan sebagai penghambat tirosinase pada ekstrak etanol dan fraksi n-heksana dari analisis GC-MS antara lain *chalcone*, *ferulic acid*, *4-nitrocinnamic acid*, *4-aminobenzoic acid*, *2TMS derivative*, *4-hydroxybenzoic acid*, *4-tert-butylphenol*, *1-tetradecanol*, *n-Hexadecanoic acid methyl ester*, *palmitic acid*, *2-(2-Aminophenyl)-1H-benzimidazole* dan *5-methylsalicylic acid*. Hasil ini menunjukkan fraksi n-heksana *Ulva lactuca* potensial sebagai inhibitor tirosinase alami.

Kata kunci: Aktivitas penghambatan tirosinase, penghambat tirosinase alami, IC_{50} , ekstrak etanol, *Ulva lactuca*

Abstract

IN VITRO TYROSINASE INHIBITORY ACTIVITY OF *Ulva lactuca* ETHANOLIC EXTRACT AND ITS FRACTIONS

Ulva lactuca is green algae that contains various bioactive compounds beneficial to humans and various fields. This study aimed to determine the tyrosinase inhibition activity and predict the active compounds from ethanolic extract of *Ulva lactuca* and its fractions. *Ulva lactuca* was macerated using ethanol and followed by liquid-liquid extraction (fractionation) with n-hexane, chloroform, and water solvents. The ethanol extract and fractions were tested for total phenolic content, flavonoid content, and tyrosinase inhibition activity in vitro. The ethanol extract and n-hexane fraction with the highest inhibition activity were continued to *Gas Chromatography-Mass Spectrometry* (GC-MS) compounds identification. The result revealed total phenolic content in n-hexane fraction was 9.43 ± 0.27 mgGAE/g, ethanol extract was 5.48 ± 0.16 mgGAE/g, chloroform fraction was 4.80 ± 0.53 mgGAE/g, and water fraction was 1.08 ± 0.15 mgGAE/g. The flavonoid content was found to be highest in n-hexane fraction (9.20 ± 0.49 mgQE/g), followed by ethanol extract (8.84 ± 0.60 mgQE/g), chloroform fraction (6.60 ± 0.69 mgQE/g), and water fraction (1.64 ± 0.19 mgQE/g). The tyrosinase inhibition activity closest to kojic acid ($IC_{50} = 11.07 \pm 0.86$ μ g/mL) was exhibited by n-hexane fraction ($IC_{50} = 127.74 \pm 6.47$ μ g/mL) and ethanol extract ($IC_{50} = 148.19 \pm 3.24$ μ g/mL). The compound suspected to act as inhibitor tyrosinase in the ethanol extract and n-hexane fraction based on GC-MS analysis include *chalcone*, *ferulic acid*, *4-nitrocinamic acid*, *4-aminobenzoic acid*, *2TMS derivate*, *4-hydroxybenzoic acid*, *4-tert-buthylphenol*, *1-tetradecanol*, *n-Hexadecanoic acid methyl ester*, *palmitic acid*, *2-(2-Aminophenyl)-1H-benzimidazole* and *5-methylsalisily acid*. These results indicate that the n-hexane fraction of *Ulva lactuca* has the potential to be used as a natural tyrosinase inhibitor.

Keywords: Tyrosinase inhibition activity, natural tyrosinase inhibitor, IC_{50} , ethanol extract, *Ulva lactuca*