UNIVERSITAS
GADJAH MADA
**Pengaruh Amplitudo pada Ekstraksi Sargassum hystrix dengan Metode Ultrasound-Assisted Extraction
terhadap Aktivitas Anti-Tirosinase**
Sholahudin Al Ayyubi, Prof. Dr. Amir Husni, S.Pi., M.P.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

INTISARI

Pengaruh Amplitudo pada Ekstraksi *Sargassum hystrix* dengan Metode *Ultrasound-Assisted Extraction* terhadap Aktivitas Anti-Tirosinase

Enzim tirosinase berperan penting dalam biosintesis melanin sehingga menjadi target dalam pengembangan agen pencerah kulit alami. Rumput laut cokelat *Sargassum hystrix* mengandung berbagai senyawa bioaktif yang berpotensi sebagai inhibitor tirosinase. Penelitian ini bertujuan untuk mengevaluasi pengaruh metode maserasi dan *Ultrasound-Assisted Extraction* (UAE) dengan variasi amplitudo 50%, 60%, 75%, dan 90% terhadap rendemen, kadar fenolik total, kadar flavonoid total, aktivitas penghambatan enzim tirosinase, serta profil senyawa bioaktif *S. hystrix*. Sampel diekstraksi menggunakan etanol 70%. Kadar total fenol dianalisis dengan metode Folin–Ciocalteu, kadar flavonoid total menggunakan metode aluminium klorida, aktivitas anti-tirosinase diuji menggunakan enzim tirosinase jamur dengan asam kojat sebagai kontrol positif, sedangkan identifikasi senyawa bioaktif dilakukan menggunakan GC-MS. Hasil penelitian menunjukkan bahwa UAE menghasilkan rendemen, kadar fenolik total, kadar flavonoid total, dan aktivitas penghambatan tirosinase yang lebih tinggi dibandingkan maserasi. Rendemen tertinggi diperoleh pada amplitudo 90% sebesar 1,89 ± 0,01%, sedangkan kadar total fenol tertinggi diperoleh pada amplitudo 75% sebesar 26,655 ± 0,084 mg GAE/g, kadar flavonoid total tertinggi pada amplitudo 75% sebesar 84,700 ± 0,400 mg QE/g, dan aktivitas penghambatan tirosinase terbaik juga diperoleh pada amplitudo 75% dengan nilai IC_{50} sebesar 243,59 ± 36,14 µg/mL. Secara keseluruhan, metode UAE lebih baik dibandingkan maserasi dalam meningkatkan perolehan senyawa bioaktif dan aktivitas anti-tirosinase *Sargassum hystrix* , sehingga berpotensi dikembangkan sebagai bahan baku kosmetik dan kosmeseutikal.

Kata kunci: *Sargassum hystrix*; *Ultrasound-Assisted Extraction*; penghambatan tirosinase; fenolik total; flavonoid total.

UNIVERSITAS
GADJAH MADA
**Pengaruh Amplitudo pada Ekstraksi Sargassum hystrix dengan Metode Ultrasound-Assisted Extraction
terhadap Aktivitas Anti-Tirosinase**
Sholahudin Al Ayyubi, Prof. Dr. Amir Husni, S.Pi., M.P.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

ABSTRACT

Effect of Ultrasound-Assisted Extraction Amplitude on The Anti-Tyrosinase Activity of *Sargassum hystrix* Extract

Tyrosinase is a key enzyme involved in melanin biosynthesis and has become an important target in the development of natural skin-whitening agents. *Sargassum hystrix*, a brown seaweed, contains various bioactive compounds with potential tyrosinase inhibitory activity. This study aimed to evaluate the effects of maceration and *Ultrasound-Assisted Extraction* (UAE) at different amplitudes (50%, 60%, 75%, and 90%) on extraction yield, total phenolic content (TPC), total flavonoid content (TFC), tyrosinase inhibitory activity, and bioactive compound profile of S. hystrix. The dried seaweed was extracted using 70% ethanol. TPC and TFC were determined using the Folin–Ciocalteu and aluminum chloride methods, respectively, while tyrosinase inhibitory activity was evaluated using a mushroom tyrosinase assay with kojic acid as the positive control. Bioactive compounds were identified using Gas Chromatography–Mass Spectrometry (GC-MS). The results showed that UAE produced higher extraction yields, total phenolic and flavonoid contents, and tyrosinase inhibitory activity than maceration. The highest extraction yield was obtained at 90% amplitude (1.89 ± 0.01%), while the highest TPC and TFC were obtained at 75% amplitude, reaching 26.655 ± 0.084 mg GAE/g and 84.700 ± 0.400 mg QE/g, respectively. The strongest tyrosinase inhibitory activity was also obtained at 75% amplitude, with an IC_{50} value of 243,59 ± 36,14 µg/mL. Overall, UAE was a more effective extraction method than maceration for enhancing the recovery of bioactive compounds and tyrosinase inhibitory activity of *Sargassum hystrix* , indicating its potential as a raw material for cosmetic and cosmeceutical applications.

Keywords: *Sargassum hystrix* ; *Ultrasound-Assisted Extraction*; tyrosinase inhibition; total phenolic content; total flavonoid content.