SKRINING AKTIVITAS INHIBITOR ENZIM TIROSINASE DARI ISOLAT JAMUR ENDOFIT BUAH BENGKUANG (*Pachyrhizus erosus*) SEBAGAI KANDIDAT WHITENING AGENT

ABSTRAK

Umbi bengkuang (*Pachyrhizus erosus*) diketahui mengandung senyawa isoflavonoid yang berperan dalam menghambat biosintesis melanin melalui penghambatan aktivitas enzim tirosinase. Jamur endofit yang hidup di dalam jaringan umbi bengkuang berpotensi menghasilkan metabolit sekunder dengan aktivitas biologis serupa sehingga berpotensi dikembangkan sebagai sumber senyawa pencerah kulit alami. Penelitian ini bertujuan untuk mengetahui aktivitas inhibitor enzim tirosinase dari ekstrak etil asetat isolat jamur endofit umbi bengkuang (Pachyrhizus erosus) sebagai kandidat bahan aktif pencerah kulit alami. Jamur endofit diisolasi dari umbi bengkuang sehat, kemudian dilakukan pemurnian, kultivasi, dan ekstraksi menggunakan pelarut etil asetat. Aktivitas penghambatan enzim tirosinase diuji secara in vitro menggunakan substrat L-DOPA dengan asam kojat sebagai kontrol positif. Aktivitas inhibitor ditentukan berdasarkan penurunan pembentukan dopakrom yang diukur menggunakan microplate reader. Hasil penelitian menunjukkan bahwa ekstrak etil asetat isolat PE3, PE2, dan PE5 memiliki aktivitas inhibitor tirosinase yang lebih baik dibandingkan isolat lainnya. Ekstrak PE3 menunjukkan aktivitas tertinggi dengan nilai potensiasi sebesar 21,01%, diikuti PE2 sebesar 15,00% dan PE5 sebesar 13,58% relatif terhadap asam kojat, sedangkan ekstrak PE1 dan PE4 menunjukkan aktivitas yang lebih rendah dengan nilai potensiasi masing-masing sebesar 0,362% dan 0,222%. Berdasarkan hasil tersebut, dapat disimpulkan bahwa ekstrak etil asetat isolat jamur endofit umbi bengkuang memiliki aktivitas sebagai inhibitor enzim tirosinase, dengan isolat PE3 menunjukkan aktivitas terbaik, sehingga berpotensi dikembangkan sebagai sumber senyawa inhibitor tirosinase alami yang dapat dimanfaatkan sebagai bahan aktif dalam formulasi kosmetik pencerah kulit.

Kata kunci: Jamur Endofit, Bengkuang, Inhibitor tirosinase, *Whitening Agent*, *Pachyrhizus erosus*

SCREENING OF TYROSINASE ENZYME INHIBITORY ACTIVITY FROM ENDOPHYTIC FUNGAL ISOLATES OF JICAMA TUBER FRUIT (*Pachyrhizus erosus*) AS A WHITENING AGENT

ABSTRAK

Pachyrhizus erosus (yam bean) tubers are known to contain isoflavonoid compounds that inhibit melanin biosynthesis through the inhibition of tyrosinase enzyme activity. Endophytic fungi inhabiting yam bean tissues are potential sources of secondary metabolites with similar biological activities and may serve as natural skin-whitening agents. This study aimed to evaluate the tyrosinase inhibitory activity of ethyl acetate extracts obtained from endophytic fungal isolates of Pachyrhizus erosus tubers as potential active ingredients for skin-whitening formulations. Endophytic fungi were isolated from healthy yam bean tubers, followed by purification, cultivation, and extraction using ethyl acetate as the extraction solvent. Tyrosinase inhibitory activity was evaluated in vitro using L-DOPA as the substrate, with kojic acid serving as the positive control. The inhibitory activity was determined based on the reduction of dopachrome formation measured using a microplate reader. The results showed that the ethyl acetate extracts of isolates PE3, PE2, and PE5 exhibited better tyrosinase inhibitory activity than the other isolates. Isolate PE3 demonstrated the highest potentiation value of 21.01%, followed by PE2 (15.00%) and PE5 (13.58%) relative to kojic acid, whereas isolates PE1 and PE4 exhibited considerably lower potentiation values of 0.362% and 0.222%, respectively. In conclusion, the ethyl acetate extracts of endophytic fungi isolated from Pachyrhizus erosus tubers possess tyrosinase inhibitory activity, with isolate PE3 exhibiting the greatest potential. These findings suggest that endophytic fungi from yam bean tubers may serve as promising natural sources of tyrosinase inhibitors for the development of skin-whitening cosmetic formulations.

Keywords: Endophytic Fungi, Jicama, Tyrosinase Inhibitor, Whitening agent, *Pachyrhizus erosus*