

**PEMANFAATAN METABOLIT SEKUNDER DAUN PAITAN
(*Tithonia diversifolia*) SEBAGAI INHIBITOR ENZIM
 α -GLUKOSIDASE**

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INTISARI

Penelitian pemanfaatan metabolit sekunder daun *Tithonia diversifolia* untuk menghambat aktivitas enzim α -glukosidase dan penentuan tipe inhibitor telah dilakukan. Penelitian diawali dengan ekstraksi metabolit sekunder dengan metode maserasi selama 24 jam menggunakan pelarut n-heksana dan etanol 70%. Kandungan metabolit sekunder yang terdapat pada ekstrak n-heksana (EH) dan ekstrak etanol 70% (EE) dianalisis secara kualitatif melalui uji fitokimia menggunakan metode uji warna. Enzim α -glukosidase diperoleh melalui isolasi dan pemurnian parsial dari beras lapuk. Pemurnian parsial ekstrak kasar enzim α -glukosidase dilakukan dengan pengendapan menggunakan ammonium sulfat dan dialisis. Enzim α -glukosidase hasil pemurnian diuji aktivitas dan ditentukan kinetika reaksi enzimatisnya. Metabolit sekunder yang bersifat polar dan non polar diuji aktivitas penghambatannya terhadap enzim α -glukosidase dengan menentukan persentase inhibisi serta tipe inhibitornya.

Hasil penelitian menunjukkan bahwa EH dengan rendemen 0,70% mengandung senyawa golongan terpenoid sedangkan EE dengan rendemen 2,57% mengandung senyawa golongan flavonoid dan tanin. Pemurnian parsial ekstrak kasar enzim mampu meningkatkan aktivitas enzim α -glukosidase sebesar 0,044 U/mL. Enzim α -glukosidase dapat menghidrolisis substrat *p*-nitrofenil- α -D-glukopiranosida (*p*NPG) dengan nilai K_M sebesar 9,915 mM dan V_{maks} sebesar 0,706 μ mol/menit. Aktivitas penghambatan tertinggi terhadap α -glukosidase oleh metabolit sekunder polar sebesar 48,68% pada konsentrasi 6,25 mg/L. Metabolit sekunder nonpolar sebesar 6,21% pada konsentrasi 12,50 mg/L sedangkan aktivitas penghambatan quersetin sebagai kontrol positif sebesar 35,39% pada konsentrasi 50 mg/L. Hasil tersebut menyatakan bahwa metabolit sekunder polar berpotensi menghambat aktivitas enzim α -glukosidase dengan tipe inhibitor unkompetitif.

Kata kunci: aktivitas, enzim α -glukosidase, inhibitor, dan metabolit sekunder.

**THE USE OF SECONDARY METABOLITES OF MEXICAN
SUNFLOWER (*Tithonia diversifolia*) LEAF AS
 α -GLUCOSIDASE INHIBITOR**

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ABSTRACT

Research of α -glucosidase inhibiting activity and inhibition type of secondary metabolites from *Tithonia diversifolia* have been done. The α -glucosidase was extracted from the partial purification of rotting-rice. Firtsly, *T. diversifolia* leaves were macerated using n-hexane and 70% ethanol for 24 hours. Phytochemical analysis revealed the presence of secondary metabolites in n-hexane extract (EH) and ethanol 70% extract (EE) qualitatively by varying color. The α -glucosidase was obtained by isolation and partial purification of rotting-rice. Crude extract enzyme was partial purified by ammonium sulfate precipitation and dialysis method. Then, activity of α -glucosidase and reaction kinetic were determined. The percent of inhibition from both polar and non-polar secondary metabolites was determined through inhibitory assay. Inhibition type of secondary metabolites was investigated.

The results showed that 0.70% of n-hexane extract contains the terpenoids while 2.57% of etanol extract contains the flavonoid and tannin. Increasing of α -glucosidase activity (0.044 U/mL) is caused by partial purified of crude extract enzyme. The pNPG substrate is hydrolyzed by α -glucosidase with K_M value is 9.915 mM and V_{max} is 0.706 μ mol/min. The inhibitory activity results showed the polar secondary metabolites has the highest inhibitory activity is 48.68% at concentration of 6.25 mg/L. Non-polar secondary metabolites is 6.21% at concentration of 12.50 mg/L and quercetin as positive control is 35.39% at concentration of 50.00 mg/L. Therefore, polar secondary metabolites might be potential as un-competitive inhibitors in inhibiting activity of α -glucosidase.

Keyword: activity, enzyme of α -glucosidase, inhibitor, and secondary metabolites.