

**PENGHAMBATAN SENYAWA METABOLIT SEKUNDER DAUN  
KELOR (*Moringa oleifera*) TERHADAP AKTIVITAS ENZIM  $\alpha$ -  
GLUKOSIDASE YANG DIISOLASI  
DARI BERAS LAPUK**

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**INTISARI**

Penelitian penghambatan senyawa metabolit sekunder daun *Moringa oleifera* untuk menghambat aktivitas enzim  $\alpha$ -glukosidase dan penentuan tipe inhibitor telah dilakukan. Penelitian diawali dengan ekstraksi metabolit sekunder dengan metode maserasi menggunakan pelarut n-heksana dan etanol selama 3x8 jam. Kandungan metabolit sekunder pada ekstrak n-heksana (EH) dan ekstrak etanol (EE) dianalisis secara kualitatif melalui uji fitokimia menggunakan uji warna. Enzim  $\alpha$ -glukosidase diperoleh melalui isolasi dari beras lapuk dan pemurnian parsial dengan fraksinasi ammonium sulfat dan dialisis. Enzim  $\alpha$ -glukosidase hasil pemurnian diuji aktivitas dan ditentukan kinetika reaksi enzimatisnya berupa nilai  $V_{maks}$  yaitu kecepatan maksimum enzim yang tidak dapat bertambah lagi dengan penambahan konsentrasi substrat dan nilai  $K_M$  yaitu konsentrasi substrat untuk mencapai  $\frac{1}{2}$  nilai  $V_{maks}$ . Metabolit sekunder daun *Moringa oleifera* diuji aktivitas penghambatannya terhadap enzim  $\alpha$ -glukosidase dengan menentukan persentase inhibisi serta tipe inhibitornya.

Hasil penelitian menunjukkan rendemen EH 1,94 % mengandung flavonoid dan alkaloid, sedangkan EE 5,14 % mengandung flavonoid, alkaloid, terpenoid, dan tanin. Aktivitas enzim  $\alpha$ -glukosidase setelah pemurnian parsial meningkat dari 0,019 U/mL menjadi 0,044 U/mL dengan  $K_M$  9,919 mM dan  $V_{maks}$  0,706 mmol/menit. Nilai % inhibisi enzim  $\alpha$ -glukosidase tertinggi diakibatkan oleh penambahan ME konsentrasi 25,00 mg/L sebesar 44,27 % dan kontrol positif quersetin konsentrasi 50,00 mg/L sebesar 35,42 %. Hasil tersebut menyatakan bahwa ME dan quersetin berpotensi menghambat aktivitas enzim  $\alpha$ -glukosidase dengan tipe inhibitor unkompetitif.

Kata kunci : *Moringa oleifera*, enzim  $\alpha$ -glukosidase, inhibitor

**INHIBITION ASSAY OF DRUMSTICK LEAF (*Moringa oleifera*)  
SECONDARY METABOLITE COMPOUNDS AGAINST  
ACTIVITY OF  $\alpha$ -GLUCOSIDASE ENZYME  
ISOLATED FROM ROTTEN RICE**

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**ABSTRACT**

Research of  $\alpha$ -glucosidase inhibiting activity and inhibition type of secondary metabolites from *Moringa oleifera* have been done. Firstly, *Moringa oleifera* leaves were extracted using n-hexane and ethanol for 3x8 hours. Phytochemical analysis revealed the presence of secondary metabolites in n-hexane extract (EH) and ethanol extract (EE) qualitatively by varying color. The  $\alpha$ -glucosidase was obtained by isolation from rotten rice and partial purification using ammonium sulfate fractionation and dialysis. Then, activity of  $\alpha$ -glucosidase and reaction kinetic consist of  $V_{maks}$  and  $K_M$  were determined.  $V_{maks}$  is the maximal velocity when increasing the substrate concentration indefinitely doesn't increase the rate of an enzyme-catalyzed reaction, while  $K_M$  is the substrate concentration that gives the enzyme  $\frac{1}{2}$  of its  $V_{maks}$ . The percent of inhibition from secondary metabolites of *Moringa oleifera* leaf was determined through inhibitory assay. Inhibition type of secondary metabolites was investigated.

The results showed that 1.94 % EH yield contains flavonoid and alkaloid, while 5.14 % EE contains flavonoid, alkaloid, terpenoids, and tannin. Increasing of  $\alpha$ -glucosidase activity from 0.019 U/mL to 0.044 U/mL is caused by partial purified of crude extract enzyme with the kinetic parameters  $K_M$  9.919 mM and  $V_{maks}$  0.706 mmol/menit. The highest % inhibition value of  $\alpha$ -glucosidase caused by ME with concentrate of 25.00 mg/L in the amount of 44.27 % and quercetin as positive control concentrate of 50.00 mg/L in the amount of 35.42 %. Therefore, ME might be potential as uncompetitive inhibitors in inhibiting activity of  $\alpha$ -glucosidase.

Keywords : *Moringa oleifera*,  $\alpha$ -glucosidase enzyme, inhibitor