SINTESIS ANALOG KURKUMIN MONOKETON BERBAHAN DASAR *p*-DIMETILAMINOBENZALDEHIDA DENGAN SIKLOHEKSANON DAN UJI AKTIVITASNYA SEBAGAI INHIBITOR ENZIM α-AMILASE

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INTISARI

Sintesis analog kurkumin monoketon berbahan dasar *p*-dimetilamino benzaldehida dengan sikloheksanon dan uji aktivitasnya sebagai inhibitor enzim α-amilase telah berhasil dilakukan**.** Sintesis ini dilakukan dengan tujuan untuk memperoleh senyawa analog kurkumin dari *p*-dimetilaminobenzaldehida dengan sikloheksanon, mengetahui aktivitas penghambatan senyawa analog kurkumin hasil sintesis terhadap enzim α-amilase, dan tipe inhibitornya. Sintesis analog kurkumin dilakukan dengan mereaksikan *p*-dimetilaminobenzaldehida dengan sikloheksanon menggunakan pelarut etanol dan katalis KOH 5 % yang dilakukan dengan metode refluks selama 50 menit pada suhu 50 ºC. Hasil sintesis dikarakterisasi menggunakan FTIR, *Direct Inlet-MS* (DI-MS), ^{1}H-NMR, dan ^{13}C-NMR. Senyawa analog kurkumin yang diperoleh kemudian diuji aktivitas inhibisinya terhadap enzim α-amilase serta ditentukan tipe inhibitornya. Uji aktivitas inhibisi terhadap enzim α-amilase dilakukan juga pada akarbosa sebagai pembanding.

Produk hasil sintesis kurkumin yang diperoleh yaitu (2E,5E)-2,5-bis(4-(dimetilamino)benzilidin)sikloheksanon dengan rendemen 53,33 %. Senyawa analog kurkumin menunjukkan aktivitas inhibisi tertinggi sebesar 96,56 % pada konsentrasi 0,500 mM, sedangkan senyawa akarbosa menunjukkan aktivitas inhibisi tertinggi sebesar 90,19 % pada konsentrasi 1,000 mM. Hasil ini menunjukkan senyawa analog kurkumin memiliki aktivitas inhibisi terhadap enzim α-amilase yang lebih baik dibanding akarbosa. Berdasarkan hasil penentuan nilai K_M dan V_{maks} maka diketahui tipe inhibitor analog kurkumin hasil sintesis dan akarbosa berupa tipe inhibitor unkompetitif.

Kata kunci: akarbosa, analog kurkumin, *p*-dimetilaminobenzaldehida, enzim α-amilase

SYNTHESIS OF MONOKETONE CURCUMIN ANALOGUE FROM *p*-DIMETHYLAMINOBENZALDEHIDE WITH CYCLOHEXANONE AND ITS ACTIVITY ASSAY *AS INHIBITOR OF α-AMYLASE ENZYME*

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ABSTRACT

A synthesis of monoketone curcumin analogue from *p*-dimethylamino-benzaldehyde with cyclohexanone and its activity test as inhibitor of α-amylase enzyme has been done. The aims of the synthesis are to obtain curcumin analogue compound from *p*-dimethyl-aminobenzaldehyde by reaction with cyclohexanone, to know the inhibition type and activity of curcumin analogue on α-amylase. The synthesis was initiated by reacting *p*-dimethylaminobenzaldehyde with cyclohexanone using ethanol as a solvent in the presence of KOH 5 % catalyst by reflux method for 50 min at 50 ºC. The product was characterized using FTIR, Direct Inlet-MS, ^{1}H- NMR, and ^{13}C-NMR. Inhibiton assay against α-amylase enzyme was performed towards product of analogue curcumin synthesis and type of inhibitor was investigated. Inhibition assay against α-amylase enzyme was carried out towards acarbose as a comparison.

The curcumin synthesis product obtained was (2E,5E)-2,5-bis(4-dimethylamino)benzylidine)cyclohexanone with 53.33 % yield. Curcumin analogue has a highest inhibiton 96.56 % at 0.500 mM, while acarbose has a highest inhibition 90.19 % at 1.00 mM. This results showed that curcumin analogue has better inhibition assay against α-amylase enzyme than acarbose. The determination of K_M and V_{max} showed that the inhibitor type of curcumin analogue product and acarbose are uncompetitive.

Keywords: acarbose, analogue curcumine, *p*-dimethylaminobenzaldehyde, enzyme α-amylase