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

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INTISARI

Sintesis analog kurkumin monoketon berbahan dasar *p*-dimetilaminobenzaldehida dan uji aktivitasnya sebagai inhibitor enzim α-amilase telah berhasil dilakukan**.** Sintesis ini dilakukan dengan tujuan memperoleh senyawa analog kurkumin dari *p*-dimetilaminobenzaldehida dengan aseton dan siklopentanon, melakukan uji aktivitas penghambatan senyawa analog kurkumin hasil sintesis terhadap enzim α-amilase, dan mengetahui tipe inhibitor senyawa analog kurkumin yang menghambat aktivitas enzim α-amilase. Penelitian ini dilakukan dengan mereaksikan *p*-dimetilaminobenzaldehida dengan aseton dan siklopentanon 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. Hasil sintesis analog kurkumin kemudian diuji aktivitas penghambatannya sebagai inhibitor enzim α-amilase menggunakan pereaksi iodin serta ditentukan tipe inhibitor analog kurkumin hasil sintesis**.**

Produk hasil sintesis kurkumin yang diperoleh yaitu (1E,4E)-1,5-bis(4-(dimetilamino)fenil)penta-1,4-dien-3-on dengan rendemen 68,13% dan (2E,5E)-2,5-bis(4-dimetilamino)benzilidin)siklopentanon dengan rendemen 76,87%. Persen inhibisi tertinggi analog kurkumin hasil sintesis berturut-turut yaitu 96,91% dan 95,89 % pada konsentrasi 0,5 mM. Berdasarkan hasil penentuan nilai K_M dan V_{maks} maka diketahui tipe inhibitor analog kurkumin hasil sintesis berupa tipe inhibitor unkompetitif.

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

SYNTHESIS OF MONOKETONE CURCUMIN ANALOGUE FROM p-DIMETHYLAMINOBENZALDEHIDE AND THEIR ACTIVITY ASSAY AS INHIBITOR OF α-AMYLASE ENZYME

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ABSTACT

Synthesis of monoketone curcumin analogue from *p*-dimethyl-aminobenzaldehyde and its activity test as inhibitor of α-amylase enzyme has been done. The aims of the synthesis are to obtain curcumin analog compound from *p*-dimethyl-aminobenzaldehyde by reaction with acetone and cyclopentanone, to test the inhibition activity of curcumin analogue on α-amylase enzyme, and to know the type of inhibitor of analogue monoketone curcumin.The synthesis was initiated by reacting *p*-dimethylaminobenzaldehyde with aceton and cyclopentanone using ethanol as a solvent in the presence of KOH 5% catalyst by reflux method for 50 min at 50ºC. The products were characterized using FTIR, Direct Inlet-MS, ^{1}H-NMR, and ^{13}C-NMR. Inhibitory activity as an amylase enzyme inhibitor was tested using iodine reagent and the inhibitor type of product was determined.

The curcumin synthesis products obtained were (1E,4E)-1,5-bis(4-(dimethylamino)phenyl)penta-1,4-dien-3-on with 68.13% yield and (2E, 5E)-2,5-bis(4-dimethylamino)benzylidine)cyclopentanone with 76.87% yield. The highest inhibition percentages of curcumine analogue were 96.91% and 95.89% respectively at 0.5 mM concentration. The determination of K_M and V_{max} showed that the type of curcumin analogue products are uncompetitive inhibitor type.

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