

**SINTESIS (2E,5E)-2,5-BIS(3,4-DIMETOKSIBENZILIDIN)
SIKLOPENTANON DAN EFEK SINERGISITASNYA DENGAN ASAM
FERULAT SEBAGAI INHIBITOR ENZIM α -AMILASE**

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INTISARI

Sintesis senyawa analog kurkumin berbahan dasar veratraldehida, dan uji inhibisi enzim α -amilase serta sinergisitasnya dengan asam ferulat telah dilakukan. Tahap sintesis melibatkan kondensasi Claisen-Schmidt dari veratraldehida dan siklopentanon menggunakan katalis basa dalam pelarut etanol serta dilakukan dengan sonikasi selama 15 menit, menghasilkan senyawa analog kurkumin ((2E,5E)-2,5-bis(3,4-dimetoksibenzilidin)siklopentanon). Tahap berikutnya adalah uji inhibisi terhadap enzim α -amilase dan sinergisitasnya dengan asam ferulat menggunakan iodine dan DNS sebagai reagen kemudian diukur absorbansinya dengan *microplate reader* pada panjang gelombang 550 nm dan dihitung % inhibisinya.

Hasil sintesis analog kurkumin dari metode sonokimia yaitu padatan kuning dengan rendemen 85,71%, titik leleh 194 °C dan waktu reaksi 15 menit. Hasil uji inhibisi analog kurkumin terhadap enzim α -amilase menunjukkan %inhibisi sebesar 160,63% pada konsentrasi 0,25 mM (reagen iodine) dan 84,11% pada konsentrasi 1 mM (reagen DNS). Berdasarkan hasil studi analog kurkumin dengan asam ferulat menunjukkan aktivitas inhibisi yang lebih baik seiring penambahan konsentrasi senyawa analog kurkumin menggunakan reagen iodine dan pada reagen DNS menunjukkan hasil optimum pada komposisi (4:1) sebesar 80,13%.

Kata kunci: analog kurkumin, α -amilase, sinergi, metode sonokimia

***SYNTHESIS OF (2E,5E)-2,5-BIS(3,4-DIMETOXYBENZILIDENE)
CYCLOPENTANONE AND SYNERGISTIC EFFECT WITH FERULIC ACID
AS α -AMYLASE ENZYME INHIBITOR***

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ABSTRACT

Synthesis of curcumin analogs from veratraldehyde and their inhibition test to α -amylase enzyme and their synergism effect with ferulic acid have been performed. The synthesis involves Claisen-Schmidt condensation reaction from veratraldehyde and cyclopentanone catalyzed with base using ultrasound-assisted in 15 minute to yield curcumin analog ((2E,5E)-2,5-bis(3,4-dimethoxybenzylidene) cyclopentanone). After that, inhibition test of curcumin analog and its synergistic effect with ferulic acid against α -amylase enzyme using iodine and DNS as reagent. Inhibition percentages were calculated using the quantized absorbance results from microplate reader at 550 nm wavelength.

Result of this study showed that curcumin analog yield a yellow colored solid material with rendement of 85.71% and melting point at 194 °C. Inhibition test against α -amylase enzyme using curcumin analogue showed inhibition percentage of 160.63% at concentration 0.25 mM (with iodine as reagent) and 84.11% at konsentration 1 mM (with DNS as reagent). Based on the result of synergy study curcumin analogue indicated synergistic effect with ferulic acid that showed high inhibition percentage against α -amylase enzyme with added curcumin analogue, and with DNS as reagent it was concluded that the optimum inhibition activity at the composition of curcumin analogue : ferulic acid (4:1) with an inhibition percentage of 80.13%.

Key words: curcumin analogue, α -amylase enzyme, synergistic effect, ultrasound-assisted