

SINTESIS SENYAWA TURUNAN ZINGERON DAN TURUNAN RASPBERRY KETON SERTA UJI POTENSI SEBAGAI ATRAKTAN LALAT BUAH HAMA

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INTISARI

Sintesis senyawa 4-(5-bromo-4-hidroksi-3-metoksifenil)-3-buten-2-ol (**A₂**), 4-(3,5-dibromo-4-hidroksifenil)-3-buten-2-ol (**B₂**), dan 4-(5-bromo-4-hidroksi-3-metoksifenil)-2-butanon (**A₃**), 4-(3,5-dibromo-4-hidroksifenil)-2-butanon (**B₃**) dan uji potensi sebagai atraktan lalat buah telah dilakukan. Tujuan penelitian ini adalah untuk mendapatkan senyawa atraktan lalat buah hama yang baru selain metil eugenol dan *cue lure*. Sintesis senyawa turunan zingeron dan raspberry keton (**A₂**, **B₂**, **A₃**, dan **B₃**) tersebut dilakukan melalui tiga tahap, tahap pertama yaitu reaksi brominasi terhadap vanilin dan 4-hidroksibenzaldehida dengan menggunakan KBrO₃ dan HBr dalam kondisi asam. Tahap kedua yaitu reaksi kondensasi aldol terhadap 5-bromovanilin dan 4-hidroksibenzaldehida dengan aseton menggunakan katalis NaOH 20%. Tahap ketiga yaitu sintesis senyawa turunan zingeron dan raspberry keton (**A₂** dan **B₂**) melalui reaksi reduksi produk kondensasi aldol dengan NaBH₄, sedangkan turunan zingeron dan raspberry keton (**A₃** dan **B₃**) disintesis melalui reaksi reduksi produk kondensasi aldol dengan NaBH₄ dan NiCl₂·6H₂O. Semua produk hasil reaksi dianalisis dengan FT-IR, GC-MS, ¹H-NMR dan ¹³C-NMR.

Hasil penelitian menunjukkan bahwa reaksi brominasi vanilin dan 4-hidroksibenzaldehida masing-masing menghasilkan 5-bromovanilin dan 3,5-dibromo-4-hidroksibenzaldehida berupa padatan berwarna putih dengan rendemen 82,28 dan 56,52%. Hasil reaksi kondensasi aldol berupa padatan berwarna kuning dengan rendemen masing-masing 93,33 dan 40,54%. Hasil sintesis turunan zingeron dan turunan raspberry keton (**A₂**, **B₂**, **A₃**, dan **B₃**) berupa cairan dengan rendemen masing-masing 48,77; 37,60; 68,18; dan 59,37%. Uji potensi sebagai atraktan lalat buah hama menunjukkan bahwa senyawa hasil sintesis (**A₂**, **B₂**, **A₃**, dan **B₃**) dapat memikat lalat buah (*Bactrocera* spp).

Kata kunci : atraktan, raspberry keton, reduksi, zingereon

SYNTHESIS OF ZINGERONE AND RASPBERRY KETONE DERIVATIVES AND THEIR POTENSIAL TEST AS PEST FRUIT FLY ATTRACTANT

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ABSTRACT

Synthesis of 4-(5-bromo-4-hydroxy-3-methoxyphenyl)-3-buten-2-ol (**A₂**), 4-(3,5-dibromo-4-hydroxyphenyl)-3-buten-2-ol (**B₂**), 4-(5-bromo-4-hydroxy-3-methoxyphenyl)-2-butanone (**A₃**), and 4-(3,5-dibromo-4-hydroxyphenyl)-2-butanone (**B₃**) and their potensial test as fruit flies attractant have been done. The aim of this research was to found new fruit flies attractant compounds beside methyl eugenol dan *cue lure*. Synthesis of zingerone and raspberry ketone derivatives (**A₂**, **B₂**, **A₃**, and **B₃**) were carried out in tree steps reaction. First, the bromination of vanillin and 4-hydroxybenzaldehyde were performed using KBrO₃ and HBr in acidic condition. Second, aldol condensation of 5-bromovanillin and 3,5-dibromo-4-hydroxybenzaldehyde with acetone using base catalyst NaOH 20%. Third, the zingerone and raspberry ketone derivatives (**A₂** and **B₂**) were synthesized by reacting the reduction reaction of aldol condensation products with NaBH₄, while zingerone and raspberry ketone derivatives (**A₃** and **B₃**) were synthesized by reacting the reduction reaction of aldol condensation products with NaBH₄ and NiCl₂.6H₂O. All of products were analyzed by FT-IR GC-MS, ¹H-NMR and ¹³C-NMR.

The result showed that the bromination of vanillin and 4-hydroxy benzaldehyde produced 5-bromovanilin and 3,5-dibromo-4-hydroxybenzaldehyde as white powder with 82.28 and 56.52% yield. The result of aldol condensation reaction produced yellow powder in 93.33 and 40.54%. Synthesis of zingerone and raspberry ketone derivatives (**A₂**, **B₂**, **A₃**, and **B₃**) were yielded 48.77; 37.60; 68.18 and 59.37%, respectively as liquid. Potensial test as attractant of pest fruit flies showed that synthesized compounds (**A₂**, **B₂**, **A₃**, and **B₃**) could lure pest fruit flies (*Bactrocera* spp).

Keyword: *attractant, raspberry ketone, reduction, zingerone*