

**SINTESIS 4-(3-HIDROKSIFENIL)-2-BUTANON DAN  
4-(3-ASETOKSIFENIL)-2-BUTANON SECARA SONOKIMIA  
SERTA UJI POTENSI SEBAGAI ATRAKTAN LALAT BUAH HAMA**

Umi Mariasih  
14/364447/PA/16017

**INTISARI**

Telah dilakukan sintesis 4-(3-hidroksifenil)-2-butanon dan 4-(3-asetoksifenil)-2-butanon secara sonokimia serta uji potensi sebagai atraktan lalat buah hama. Tujuan penelitian ini adalah untuk mendapatkan senyawa atraktan lalat buah hama yang baru selain metil eugenol dan *cuelure*.

Sintesis senyawa 4-(3-hidroksifenil)-2-butanon telah dilakukan melalui dua tahap reaksi, yaitu kondensasi aldol antara 3-hidroksibenzaldehida dan aseton menggunakan katalis NaOH 30% (b/v) dengan metode sonokimia dan konvensional yang dilanjutkan dengan hidrogenasi menggunakan katalis nikel borida dengan metode konvensional. Sintesis senyawa 4-(3-asetoksifenil)-2-butanon telah dilakukan melalui tiga tahap reaksi, yaitu kondensasi aldol yang dilanjutkan asetilasi hasil kondensasi dengan anhidrida asetat menggunakan katalis piridin. Kedua tahap ini dilakukan dengan metode sonokimia dan konvensional. Tahap ketiga, hidrogenasi produk asetilasi menggunakan katalis nikel borida dengan metode konvensional. Senyawa hasil sintesis dianalisis dengan FTIR, GC-MS, <sup>1</sup>H-NMR dan <sup>13</sup>C-NMR, kemudian dilakukan uji atraktansi terhadap lalat buah hama.

Karakterisasi menggunakan FTIR, GC-MS, <sup>1</sup>H-NMR dan <sup>13</sup>C-NMR menunjukkan bahwa tahap kondensasi aldol dengan metode sonokimia menghasilkan serbuk kuning 4-(3-hidroksifenil)-3-buten-2-on dengan titik leleh 214-216 °C dan persen hasil 64,81%, yang optimum pada tahap I 10 menit serta tahap II 8 menit, sedangkan dengan metode konvensional tidak diperoleh senyawa target. Tahap asetilasi dengan metode sonokimia menghasilkan serbuk putih susu 4-(3-asetoksifenil)-3-buten-2-on dengan titik leleh 178 °C dan persen hasil 40,53%, dengan metode konvensional diperoleh hasil 6,12% berupa serbuk merah muda dengan titik leleh 177 °C. Tahap hidrogenasi menghasilkan cairan kental kuning 4-(3-hidroksifenil)-2-butanon dan 4-(3-asetoksifenil)-2-butanon dengan persen hasil berturut-turut sebesar 16,34% dan 29,85%. Senyawa 4-(3-hidroksifenil)-2-butanon dapat memikat lalat buah hama *Atherigona orientalis* dan *Bactrocera* spp, sedangkan senyawa 4-(3-asetoksifenil)-2-butanon dapat memikat lalat buah hama *Dacus* spp.

Kata kunci : 4-(3-hidroksifenil)-2-butanon, 4-(3-asetoksifenil)-2-butanon, lalat buah hama, nikel borida dan sonokimia.

**SYNTHESES OF 4-(3-HYDROXYPHENYL)-2-BUTANONE AND 4-(3-ACETOXYPHENYL)-2-BUTANONE BY SONOCHEMISTRY AND THEIR POTENTIAL TEST AS PEST FRUIT FLY ATTRACTANT**

Umi Mariasih  
14/364447/PA/16017

**ABSTRACT**

Syntheses of 4-(3-hydroxyphenyl)-2-butanone and 4-(3-acetoxyphenyl)-2-butanone by sonochemistry and their potential test as pest fruit fly had been done. The aim of this research was to found a new fruit fly attractant compound besides methyl eugenol and *cuelure*.

The synthesis of 4-(3-hydroxyphenyl)-2-butanone compound had been done by two-stages reaction, there were aldol condensation between 3-hydroxybenzaldehyde and acetone using NaOH 30% (w/v) catalyst with sonochemistry and conventional methods followed by hydrogenation using nickel boride catalyst with conventional method. The synthesis of 4-(3-acetoxyphenyl)-2-butanone compound had been done by three-stages reaction, there were aldol condensation followed by acetylation of the condensation product with acetate anhydride using pyridine catalyst. The two of them had been done by sonochemistry and conventional methods. The third stage, hydrogenation of acetylation product using nickel boride catalyst with conventional method. The compounds of synthesis product were analyzed by FTIR, GC-MS, <sup>1</sup>H-NMR and <sup>13</sup>C-NMR, they were tested for attractiveness of pest fruit fly.

The characterization using FTIR, GC-MS, <sup>1</sup>H-NMR and <sup>13</sup>C-NMR showed that aldol condensation stage with sonochemistry method produced yellow powder of 4-(3-hydroxyphenyl)-3-buten-2-one compound with melting point 214-216 °C and percent result of 64.81% which optimum at stage I 10 minutes and stage II 8 minutes, whereas by conventional method was not obtained target compound. The acetylation stage with sonochemistry method produced white milk powder of 4-(3-acetoxyphenyl)-3-buten-2-one with melting point 178 °C and percent yield of 40.53%, by conventional method produced 6.12% pink powder with melting point 177 °C. The hydrogenation stage produced yellow viscous liquid of 4-(3-hydroxyphenyl)-2-butanone and 4-(3-acetoxyphenyl)-2-butanone compounds with percent of yield 16.34% and 29.85%, respectively. The 4-(3-hydroxyphenyl)-2-butanone compound could attracted the *Atherigona orientalis* and *Bactrocera* spp pest fruit fly, while 4-(3-acetoxyphenyl)-2-butanone compound could attracted the *Dacus* spp pest fruit fly.

Keywords : 4-(3-hydroxyphenyl)-2-butanone, 4-(3-acetoxyphenyl)-2-butanone, pest fruit fly, nickel boride and sonochemistry.