SINTESIS 4-(4-HIDROKSI-3-METOKSIFENIL)-2-BUTANON DAN 4-(4-ASETOKSI-3-METOKSIFENIL)-2-BUTANON SERTA UJI POTENSINYA SEBAGAI ATRAKTAN LALAT BUAH HAMA (*Bactrocera* spp.)

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INTISARI

Sintesis 4-(4-hidroksi-3-metoksifenil)-2-butanon dan 4-(4-asetoksi-3-metoksifenil)-2-butanon serta uji potensinya sebagai atraktan lalat buah hama (*Bactrocera* spp.) telah dilakukan. Sintesis 4-(4-hidroksi-3-metoksifenil)-2-butanon dilakukan melalui 2 tahap reaksi. Pertama, reaksi kondensasi aldol antara vanilin dan aseton dengan katalis basa NaOH 30% menghasilkan 4-(4-hidroksi-3-metoksifenil)-3-buten-2-on. Kedua, reaksi hidrogenasi katalitik menggunakan katalis nikel borida. Sintesis 4-(4-asetoksi-3-metoksifenil)-2-butanon dilakukan melalui 3 tahap reaksi. Pertama, kondensasi aldol antara vanilin dengan aseton. Kedua, asetilasi antara senyawa 4-(4-hidroksi-3-metoksifenil)-3-buten-2-on dengan anhidrida asetat menghasilkan 4-(4-asetoksi-3-metoksifenil)-3-buten-2-on. Ketiga, hidrogenasi katalitik dengan katalis nikel borida. Kondensasi aldol dan asetilasi dilakukan dengan metode sonokimia dan konvensional. Hidrogenasi katalitik dilakukan dengan metode konvensional. Struktur produk dielusidasi dengan instrumen FTIR, DI-MS, GC-MS dan ^{1}H-NMR.

Reaksi kondensasi aldol dengan metode sonokimia menghasilkan 4-(4-hidroksi-3-metoksifenil)-3-buten-2-on dengan wujud serbuk halus, berwarna kuning cerah, dengan rendemen 50,08%. Sintesis 4-(4-hidroksi-3-metoksifenil)-3-buten-2-on dengan metode konvensional, berwujud serbuk halus, berwarna kuning cerah, dengan rendemen 46,10%. Produk reaksi asetilasi dengan metode sonokimia 4-(4-asetoksi-3-metoksifenil)-3-buten-2-on berwujud serbuk halus, berwarna putih tulang, dengan rendemen 65,41%. Sintesis 4-(4-asetoksi-3-metoksifenil)-3-buten-2-on melalui metode konvensional menghasilkan produk berwujud serbuk halus, berwarna putih tulang, dengan rendemen 56,77%. Reaksi hidrogenasi katalitik menghasilkan senyawa 4-(4-asetoksi-3-metoksifenil)-2-butanon berwujud cair, berwarna putih kekuningan, dengan rendemen 70,71% dan 4-(4-hidroksi-3-metoksifenil)-2-butanon berwujud cair, berwarna kuning muda, dengan rendemen 73,16%. Uji potensi senyawa sebagai atraktan lalat buah hama menunjukkan bahwa senyawa 4-(4-hidroksi-3-metoksifenil)-2-butanon dan 4-(4-asetoksi-3-metoksifenil)-2-butanon dapat memikat lalat buah hama (*Bactrocera* spp.).

Kata kunci: atraktan, hidrogenasi, sonokimia

SYNTHESIS OF 4-(4-HYDROXY-3-METHOXYPHENYL)-2-BUTANONE AND 4-(4-ACETOXY-3-METHOXYPHENYL)-2-BUTANONE AND THEIR POTENTIAL TEST AS FRUIT FLY *(Bactrocera* spp.) ATTRACTANT

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ABSTRACT

Synthesis of 4-(4-hydroxy-3-methoxyphenyl)-2-butanone and 4-(4-acetoxy-3-methoxyphenyl)-2-butanone and their potential test as fruit fly *(Bactrocera* spp.) attractant had been done. Synthesis of 4-(4-hydroxy-3-methoxyphenyl)-2-butanone was carried out in 2 reactions. First, aldol condensation between vanilin and acetone using base catalyst NaOH 30% (w/v) produced 4- (4-hydroxy-3-methoxyphenyl)-3-buten-2-on. Second, catalytic hydrogenation using nickel boride catalyst. Synthesis of 4-(4-acetoxy-3-methoxyphenyl)-2-butanone was done in 3 reactions. First, aldol condensation between vanilin and acetone. Second, acetylation between 4-(4-hydroxy-3-methoxyphenyl)-3-buten-2-on and acetic anhydride produced 4-(4-acetoxy-3-methoxyphenyl)-3-buten-2-on. Third, catalytic hydrogenation using nickel boride catalyst. Aldol condensation and acetylation was carried out by sonochemical and conventional methods. Catalytic hydrogenation was done using conventional methods. The product structure was elucidated by FTIR, DI-MS, GC-MS and ^{1}H-NMR instruments.

Aldol condensation reaction through sonochemical method produced 4-(4-hydroxy-3-methoxyphenyl)-3-buten-2-on in the form of smooth powder, bright yellow, and the yield was 50.08%. Synthesis 4-(4-hydroxy-3-methoxyphenyl)-3-buten-2-on through conventional method produced smooth powder, bright yellow, and the yield was 46.10%. Acetylation reaction through sonochemical method produced 4-(4-acetoxy-3-methoxyphenyl)-3-buten-2-one in the form of smooth powder, ivory color, and the yield was 65.41%. Synthesis 4-(4-acetoxy-3-methoxyphenyl)-3-buten-2-on through conventional method produced smooth powder, ivory color, and the yield was 56.77%. The catalytic hydrogenation reaction produced 4-(4-acetoxy-3-methoxyphenyl)-2-butanone in liquid form, yellowish white color, the yield was 70.71% and 4-(4-hydroxy-3-methoxyphenyl)-2-butanone in liquid form, light yellow and the yield was 73.16%. Potential test as an attractant of fruit fly showed that 4-(4-hydroxy-3-methoxyphenyl)-2-butanone and 4-(4-acetoxy-3-methoxyphenyl)-2-butanone could lure fruit fly (*Bactrocera* spp.).

Keywords: attractant, hydrogenation, sonochemistry