SINTESIS SENYAWA TURUNAN KALKON DARI 3-KLOROASETOFENON DENGAN TURUNAN BENZALDEHIDA DAN UJI AKTIVITASNYA SEBAGAI ANTIBAKTERI

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INTISARI

Sintesis senyawa turunan kalkon dari 3-kloroasetofenon dengan turunan benzaldehida dan uji aktivitasnya sebagai antibakteri dilakukan untuk mengetahui potensi senyawa hasil sebagai antibakteri. Penelitian ini dilakukan melalui tiga tahap, tahap pertama sintesis senyawa bromovanilin dan bromoveratraldehida, masing-masing melalui brominasi vanilin dan veratraldehida dengan $KBrO_3$ dan HBr dalam suasana asam. Tahap kedua adalah sintesis kalkon melalui reaksi kondensasi Claisen-Schmidt dengan mereaksikan senyawa bromovanilin dan bromoveratraldehida dengan 3-kloroasetofenon dengan katalis NaOH 40%. Tahap terakhir adalah uji aktivitas senyawa kalkon sebagai antibakteri terhadap bakteri *Escherichia coli* dan *Staphylococcus aureus*. Karakterisasi senyawa produk dilakukan dengan GCMS, spektrometer FTIR, ^{1}H-NMR, dan ^{13}C-NMR.

Reaksi brominasi vanilin dan veratraldehida diperoleh hasil sintesis masing-masing berupa padatan berwarna putih kecoklatan dan putih tulang dengan persen hasil 86,56% dan 67,90%. Hasil sintesis kalkon diperoleh senyawa kalkon bromovanilin berupa padatan berwarna kuning dengan rendemen 93% dan senyawa kalkon bromoveratraldehida yang berwarna kuning pucat dengan rendemen 84%. Hasil uji antibakteri kalkon bromovanilin terhadap bakteri *E. Coli* memperoleh zona inhibisi 1,8; 2,1; dan 3,7 mm dan zona inhibisi terhadap *S. Aureus* 1,4; 2,6; dan 5,2 mm. Sedangkan uji antibakteri senyawa kalkon bromoveratraldehida terhadap bakteri *E. Coli* memperoleh zona inhibisi 1,2; 1,7; dan 2,9 mm sementara zona inhibisi terhadap *S. Aureus* 1,4; 1,8; dan 3,2 mm, masing-masing uji dilakukan pada konsentrasi 100, 500, dan 1000 ppm. Kontrol positif yang digunakan adalah ampisilin 100 ppm dan kontrol negatif aseton. Kalkon bromovanilin dan kalkon bromoveratraldehida berpotensi sebagai antibakteri baru dengan kategori antibakteri lemah.

Kata kunci: antibakteri, brominasi, kalkon, kondensasi

SYNTHESIS OF CHALCON DERIVATIVE COMPOUNDS FROM 3-CHLOROACETOPHENONES WITH BENZALDEHYDE DERIVATIVES AND TESTING THEIR ACTIVITY AS ANTIBACTERIALS

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ABSTRACT

Synthesis of chalcone derivative compounds from 3-chloroacetophenone with benzaldehyde derivatives and testing their activity as antibacterials were carried out to determine the potential of the resulting compounds as antibacterials. This study was carried out in three stages, the first stage was the synthesis of bromovanillin and bromoveratraldehyde compounds, respectively through the bromination of vanillin and veratraldehyde with $KBrO_3$ and HBr in acidic conditions. The second stage was the synthesis of chalcones through the Claisen-Schmidt condensation reaction by reacting bromovanillin and bromoveratral-dehyde compounds with 3-chloroacetophenone with 40% NaOH as catalyst. The final stage was the test of the activity of the chalcone compounds as antibacterials against *Escherichia coli* and *Staphylococcus aureus* bacteria. Characterization of the product compounds was carried out using GCMS, FTIR, ^{1}H-NMR, and ^{13}C-NMR spectrometers.

The bromination reaction of vanillin and veratraldehyde produced synthetic results in the form of brownish white and bone white solids, respectively, with a yield of 86.56% and 67.90%. The results of the chalcone synthesis obtained a bromovaniline chalcone compound in the form of a yellow solid with a yield of 93% and a pale yellow bromoveratraldehyde chalcone compound with a yield of 84%. The results of the antibacterial test of bromovaniline chalcone against *E. Coli* bacteria obtained inhibition zones of 1.8; 2.1; and 3.7 mm and inhibition zones against *S. Aureus* of 1.4; 2.6; and 5.2 mm. Meanwhile, the antibacterial test of the bromoveratraldehyde chalcone compound against *E. Coli* bacteria obtained inhibition zones of 1.2; 1.7; and 2.9 mm while the inhibition zones against *S. Aureus* were 1.4; 1.8; and 3.2 mm, each test was conducted at concentrations of 100, 500, and 1000 ppm. The positive control used was 100 ppm ampicillin and the negative control was acetone. Bromovaniline chalcone and bromoveretraldehyde chalcone have the potential as new antibacterials with a weak antibacterial category.

Keywords: antibacterial, bromination, chalcone, condensation