SINTESIS DAN UJI AKTIVITAS ANTIBAKTERI SENYAWA TURUNAN N-FORMIL-2-PIRAZOLINA TERSUBSTITUSI GUGUS HIDROKSI DARI *p*-ANISALDEHIDA

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INTISARI

Sintesis turunan senyawa N-formil-2-pirazolina dan uji aktivitas antibakterinya telah dilakukan. Sintesis senyawa pirazolina dilakukan melalui reaksi sikloadisi antara 1-(2,4-dihidroksifenil)-3-(4-metoksifenil)-2-propen-1-on (kalkon**)** dengan hidrazin monohidrat dalam suasana asam. Senyawa kalkon disintesis dari *p*-anisaldehida yang merupakan komponen utama minyak adas dengan 2,4-dihidroksiasetofenon melalui kondensasi *Claisen Schmidt* dalam suasana basa.

Senyawa kalkon disintesis dari *p*-anisaldehida menggunakan KOH 40% (b/b) melalui pengadukan selama 48 jam pada temperatur kamar. Sintesis senyawa 1-formil-3-(2,4-dihidroksifenil)-5-(4-metoksifenil)-2-pirazolina dilakukan dengan metode refluks antara senyawa kalkon dan hidrazin monohidrat dengan penambahan asam format selama 6 jam. Produk hasil sintesis dikarakterisasi dengan spektrometer FTIR, GC-MS, ^{1}H- dan ^{13}C-NMR. Uji antibakteri dilakukan dengan metode difusi sumuran terhadap bakteri Gram positif (*Staphylococcus aureus, Bacillus cereus, Bacillus subtilis)* dan Gram negatif (*Eschericia coli, Shigella flexneri)* dengan kontrol positif tetrasiklin (100 ppm) dan kontrol negatif dimetilsulfoksida DMSO (99,9%).

Hasil penelitian menunjukkan bahwa senyawa kalkon telah berhasil disintesis dengan rendemen sebesar 38%. Reaksi sikloadisi menghasilkan senyawa pirazolina dengan rendemen sebesar 88% dan menunjukkan aktivitas sebagai antibakteri terhadap bakteri Gram positif dan bakteri Gram negatif. Aktivitas tertinggi ditunjukkan dengan nilai DDH (mm)/konsentrasi (ppm) terhadap bakteri Gram positif yaitu *B. subtillis* (5,25/500) dan Gram negatif yaitu *S. flexneri* (3,25/100).

Kata kunci: N-formil-2-pirazolina, kalkon, *p*-anisaldehida, antibakteri

SYNTHESIS AND ANTIBACTERIAL ACTIVITY TEST OF HYDROXYL SUBSTITUTED N-FORMYL-2-PYRAZOLINE FROM *p*-ANISALDEHYDE

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ABSTRACT

Synthesis of N-formyl-2-pyrazoline derivative and test of its antibacterial activity have been carried out. The synthesis of pyrazoline was performed via cycloaddition of 1-(2,4-dihydroxyphenyl)-3-(4-methoxyphenyl)-2-propen-1-on (chalcone) by reaction with hydrazine monohydrate in acidic condition. Chalcones was synthesized from *Claisen Schmidt* condensation of *p*-anisaldehyde with 2,4-dihydroxyacetophenone.

Chalcone was synthesized from *p*-anisaldehyde using KOH 40% (w/w) at room temperature for 48 hours. Synthesis of 1-formyl-3-(2,4-dihydroxyphenyl)-5-(4-dimethoxyphenyl)-2-pyrazoline was performed by refluxing chalcone and hydrazine monohydrate in the presence of formic acid for 6 hours. All the synthesized compounds were characterized using FTIR, GC-MS, ^{1}H- and ^{13}C-NMR spectrometers. Further, pyrazolines was screened for their antibacterial activities by agar well-diffusion against Gram positive (*Staphylococcus aureus, Bacillus cereus, Bacillus subtilis*) and negative (*Eschericia coli, Shigella flexneri*) bacterial, tetracycline (100 ppm) as positive control and dimethylsulfoxide (DMSO 99.9%) as negative control.

The result showed that chalcone has been succesfully synthesized in 38% yield. Furthermore, the cycloaddition reaction yielded the pyrazoline 88% and showed significant antibacterial activity against Gram-positive bacterial and Gram negative bacterial. The highest activity showed by its zone of inhibitions(mm)/concentration(ppm) against *B. subtillis* (5.25/500) and Gram-negative *S. flexneri* (3.25/100).

Keywords: N-formyl-2-pyrazoline, chalcone, *p*-anisaldehyde, antibacterial