SINTESIS DAN UJI AKTIVITAS ANTIBAKTERI SENYAWA N-ASETIL-PIRAZOLINA DARI *p*-ANISALDEHIDA DAN 4-HIDROKSIASETOFENON

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INTI SARI

Penelitian mengenai sintesis dan uji aktivitas antibakteri senyawa N-asetil-pirazolina dari *p*-anisaldehida dan 4-hidroksiasetofenon telah dilakukan.Penelitian bertujuan untuk mensintesis senyawa pirazolina dari *p*-anisaldehida dan 4-hidroksiasetofenon serta mengetahui aktivitas antibakterinya.

Penelitian diawali dengan sintesis senyawa 1-(4-hidroksifenil)-3-(4-metoksifenil)-2-propen-1-on(kalkon **1**) melalui reaksi kondensasi Claisen Schmidt antara *p*-anisaldehida dan 4-hidroksiasetofenon menggunakan katalis NaOH 40% dengan metode pengadukan selama 48 jam pada suhu ruang. Selanjutnya siklisasi kalkon menggunakan hidrazin monohidrat dan asam asetat glasial dilakukan untuk menghasilkan senyawa 3-(4-hidroksifenil)-5-(4-metoksifenil)-1-asetil-2-pirazolina (prazolina **1**). Sintesisdilakukan dengan metode refluks selama 26 jam. Senyawa produk dianalisis menggunakan spektrometer FTIR, GC-MS, ^{1}H- dan ^{13}C-NMR. Uji aktivitas antibakteri senyawa pirazolina dilakukan dengan metode difusi sumuran terhadapbakteri Gram positif (*Staphylococcus aureus*, *Bacillus cereus*, dan*Bacillus subtilis*) dan Gram negatif (*Escherichia coli*dan *Shigella flexneri*).

Hasil penelitian yaitu produk kalkon**1** berupa kristal kuning dengan titik leleh 94,1-96,9˚C dan rendemen 88,19%. Produk senyawa pirazolina **1** berupa kristal tak berwarna (jernih) dengan titik leleh 215,7-216,9˚C dan rendemen sebesar 64,52%. Uji aktivitas antibakteri menunjukkan bahwa senyawa pirazolina **1** memiliki aktivitas antibakteri terhadap bakteri Gram positif *S. aureus* (4,5/300 dan 4,5/500), *B.cereus* (6,5/300), *B. subtilis* (3,25/500 dan 3,5/1000) dan bakteri Gram negatif *E. coli* (5,25/1000). Senyawa pirazolina **1** tidak menunjukkan aktivitas antibakteri pada bakteri Gram negatif *S. flexneri*.

Kata kunci : Kalkon, Pirazolina, *p*-Anisaldehida, Antibakteri

SYNTHESIS AND ANTIBACTERIAL TEST OF N-ACETYL-PYRAZOLINAE FROM *p*-ANYSALDEHYDE AND 4-HYDROXYACETOPHENONE

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ABSTRACT

Synthesis and antibacterialtest ofN-acetyl-pyrazoline have been carried out. Theaim of this research is to synthesis N-acetyl-pyrazolinefrom *p*-anisaldehyde and 4-hydroxyacetophenone and also to know its antibacterial activities.

This research was begins by synthesis of 1-(4-hydroxy-phenyl)-3-(4-methoxy-phenyl)-2-propene (chalcone **1**) via Claisen Schmidt condensation reaction between *p*-anisaldehyde and 4-hydroxyacetophenone using NaOH 40% as catalyst under stirring for 48 hours at room temperature. The next step was conducted by chalcone cyclization using hydrazine hydrate and glacial acetic acid to produce 3-(4-hydroxy-phenyl)-5-(4-methoxy-phenyl)-1-acetyl-2-pyrazoline (pyrazoline **1**). The synthesis was conducted under reflux method for 26 hours. The product was analyzed using FT-IR, GC-MS, ^{1}H- dan ^{13}C-NMR spectrometer. Antibacterial test of pyrazoline compound was conducted by agar well diffusion method against Gram positive bacteria (*Staphylococcus aureus, Bacillus cereus and Bacillus subtilis*) and Gram negative bacteria (*Escherichia coli and Shigella flexneri*).

The result showed that chalcone**1** product was obtained as yellow crystal with melting point at 94.1-96.9˚C and 88.19% yield. Then the cyclizationof chalcone produce pyrazoline **1**as colorless crystal with melting point at 215.7-216.9 ˚C in 64.52% yield. Antibacterial test show that pyrazoline **1** was active against selectedGram positive bacteria i.e. *S. aureus* (4.5/300 dan 4.5/500), *B. cereus* (6.5/300), *B. subtilis* (3.25/500 dan 3.5/1000) and Gram negative bacteria i.e. *E. coli* (5.25/1000). Pirazoline **1** was not active against Gram negative bacteria *S. flexneri*.

Keywords: Chalcone, Pyrazoline, *p*-Anisaldehyde, Antibacterial activity