

SINTESIS TURUNAN PIRAZOLINA SEBAGAI AGEN ANTIBAKTERI DARI VANILIN DAN MINYAK GANDAPURA

Amri Setyawati
13/350542/PPA/04093

INTISARI

Telah disintesis senyawa turunan pirazolina (**3a-3b**) dan benzohidrazida (**3c**) dari 5-bromovanilin (**1**) melalui senyawa antara kalkon (**2**), serta uji aktivitasnya sebagai antibakteri dengan metode difusi. Pirazolina disintesis dari bahan awal vanilin, sedangkan benzohidrazida disintesis dari bahan awal vanilin dan minyak gandapura. Pirazolina **3a** disintesis dengan mereaksikan kalkon dan hidrazin monohidrat melalui refluks dalam metanol, sedangkan *N*-asetil pirazolina **3b** direfluks dalam asam asetat glasial. Benzohidrazida terbentuk dari pengadukan kalkon dengan salisil hidrazin pada suhu ruang. Semua produk sintesis dianalisis strukturnya dengan spektrometer FTIR, GC-MS, ¹H- dan ¹³C-NMR. Pirazolina dan benzohidrazida hasil sintesis kemudian diuji aktivitasnya sebagai agen antibakteri terhadap 3 bakteri Gram positif (*Staphylococcus aureus*, *Bacillus subtilis*, *Bacillus cereus*) dan 2 bakteri Gram negatif (*Escherichia coli*, *Shigella flexnerri*) dengan tetrasiklin sebagai kontrol positif dan DMSO 99,99% sebagai kontrol negatif.

Hasil penelitian menunjukkan bahwa 5-bromovanillin (**1**), kalkon (**2**), pirazolina (**3a**), pirazolina (**3b**), dan benzohidrazida (**3c**) diperoleh dengan rendemen secara berurutan sebesar 98, 78, 87, 88 dan 33%. Seluruh senyawa uji menunjukkan aktivitas antibakteri dengan spektrum luas dan pirazolina (**3b**) menunjukkan peningkatan aktivitas antibakteri pada Gram positif. Aktivitas antibakteri tertinggi pirazolina dicapai oleh pirazolina (**3b**) melawan bakteri *Staphylococcus aureus* (1000 ppm: 7,25 mm), sedangkan benzohidrazida pada bakteri *Bacillus subtilis* (1000 ppm: 7,62 mm)

Kata Kunci: Vanilin, Kalkon, Pirazolina, Antibakteri



**SYNTHESES OF PYRAZOLINE DERIVATIVES AS ANTIBACTERIAL AGENTS
FROM VANILLIN AND WINTERGREEN OIL**

Amri Setyawati
13/350542/PPA/04093

ABSTRACT

The pyrazoline derivatives (**3a-3b**) and benzohydrazide (**3c**) have been synthesized from 5-bromovanillin (**1**) through chalcone intermediate (**2**). They have been tested as antibacterial agents by diffusion method. Pyrazolines were produced from vanillin while benzohydrazide was produced from wintergreen oil. Pyrazoline **3a** was synthesized by refluxing chalcone with hydrazine monohydrate in methanol, while *N*-acetyl pyrazoline **3b** was refluxed in glacial acetic acid. Benzohydrazide was formed by stirring chalcone and salicyl hydrazine at room temperature. The structure of all products was elucidated by spectrometers FTIR, GCMS, ¹H- and ¹³C-NMR. Pyrazolines and benzohydrazide products were tested as antibacterial agents to against growth of *Staphylococcus aureus*, *Bacillus subtilis*, *Bacillus cereus* (Gram positive) and *Escherichia coli*, *Shigella flexnerri* (Gram negative) with tetracycline as positive control and DMSO 99.99% as negative control.

The result showed that 5-bromovanillin (**1**), chalcone (**2**), pyrazoline (**3a**), pyrazoline (**3b**) and benzohydrazide (**3c**) were produced in 98, 78, 87, 88, and 33% yield, respectively. All of the tested compounds showed antibacterial activity in broad spectrum and pyrazoline (**3b**) showed increasing antibacterial activity for Gram positive. The highest antibacterial activity of pyrazoline was obtained by pyrazoline (**3b**) to against *Staphylococcus aureus* (1000 ppm: 7.25 mm) while benzohydrazide at (**3c**) for *Bacillus subtilis* (1000 ppm: 7.62 mm).

Keywords: Vanillin, Chalcone, Pyrazoline, Antibacterial