

## Antimicrobial Activity of Nicotinamide Derivatives against Significant Pathogenic Bacterial and Fungal Strains

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**SUMMARY.** In this work, Schiff's bases (1a-1d) were cyclized with heterocyclic aromatic aldehydes in presences of chloro acetyl chloride, triethylamine, and 1,4-dioxane to produce a series of 3-chloro-2-oxo-azetidone-1-yl)nicotinamide derivatives (2a-2d). Spectral analyses, such as IR, <sup>1</sup>H NMR, <sup>13</sup>CNMR, and mass spectral data, were used to characterize the structures of the synthesized derivatives. Antimicrobial activity against *Staphylococcus aureus*, *Bacillus subtilis*, Gram-positive bacteria, and *Escherichia coli*, *Pseudomonas aeruginosa*, Gram-negative bacteria as well as antifungal activity against *Candida albicans* was also tested. These synthesized compounds were shown to be effective against tested bacterial as well fungal strains.

**RESUMEN.** En este trabajo se ciclaron bases de Schiff (1a-1d) con aldehídos aromáticos heterocíclicos en presencia de acetil cloruro de cloro, trietilamina y 1,4-dioxano para producir una serie de 3-cloro-2-oxo-azetidina-1-ilo derivados de nicotinamida (2a-2d). Se utilizaron análisis espectrales, como IR, <sup>1</sup>H NMR, <sup>13</sup>CNMR y datos espectrales de masas, para caracterizar las estructuras de los derivados sintetizados. También se evaluó la actividad antimicrobiana contra *Staphylococcus aureus*, *Bacillus subtilis*, bacterias grampositivas y *Escherichia coli*, *Pseudomonas aeruginosa* y bacterias gramnegativas, así como la actividad antifúngica contra *Candida albicans*. Se demostró que estos compuestos sintetizados son eficaces contra cepas bacterianas y fúngicas probadas.

**KEY WORDS:** antimicrobial activity, 2-azetidone, characterization,  $\beta$ -lactam, nicotinic acid, synthesis.

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