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Microwave-assisted Synthesis and *In Vitro* Antimycobacterial Evaluation of some New *(E)*-N-benzylidene-*1H*-benzo[d]-imidazol-6-amine Derivatives

Mazen ALMEHMADI [1], Abdualziz ALSHARIF [1], Mamdouh ALLAHYANI [1] & Mohammad ASIF [2]

[1] *Department of Clinical Laboratory Sciences, College of Applied Medical Sciences, Taif University, P.O. Box 11099, Taif 21944, Kingdom of Saudi Arabia*

[2] *Department of Pharmaceutical Chemistry, Era College of Pharmacy, Era University, Lucknow, Uttar Pradesh, India*

SUMMARY. Schiff bases and benzimidazoles have demonstrated a variety of qualities against many ailments, including bacterial infections. The need for novel antimycobacterial medicines led to the design and synthesis of new benzimidazole-Schiff's bases. In this work, the synergy resulting from the successful integration of Schiff's base and the benzimidazole ring in one pharmacophore was utilized. A few benzimidazole-Schiff bases were created and their potential as in vitro antitubercular agents was examined. *(E)*-N-benzylidene-*1H*-benzo[d]-imidazol-6-amines (2a-f) was first prepared by Schiff reaction between *1H*-benzo[d]imidazol-6-amine and substituted aromatic aldehydes in presence of ethyl alcohol and glacial acetic acid by using microwave irradiation technique. The compounds' structures were determined using elemental analysis, IR, ^{1}H NMR, and MS spectrum data. The Microplate Alamar Blue Assay (MABA) method has been used to test the Schiff bases for their in vitro antimycobacterial activity against strains of *M. tuberculosis* H37RV. Among tested compounds, compound 2a with a MIC value of 6.25µg/mL and 2b with a MIC value of 3.125µg/mL showed better antitubercular activity and were comparable to Pyrazinamide and Streptomycin with a MIC value of 3.125 µg/mL and 6.25 µg/mL respectively. The electron-withdrawing group (Cl & NO_2) substituted derivative exhibited better activity than the electron-donating group (OH, CH_3, & OCH_3) substituted analogs.

RESUMEN. Las bases de Schiff y los benzimidazoles han demostrado una variedad de cualidades contra muchas dolencias, incluidas las infecciones bacterianas. La necesidad de nuevos medicamentos antimicobacterianos llevó al diseño y síntesis de nuevas bases de bencimidazol-Schiff. En este trabajo se aprovechó la sinergia resultante de la integración exitosa de la base de Schiff y el anillo de bencimidazol en un farmacóforo. Se crearon algunas bases de bencimidazol-Schiff y se examinó su potencial como agentes antituberculosos in vitro. (E)-N-benciliden-1H-benzo[d]-imidazol-6-aminas (2a-f) se preparó por primera vez mediante la reacción de Schiff entre 1H-benzo[d]imidazol-6-amina y aldehídos aromáticos sustituidos en presencia de alcohol etílico y ácido acético glacial mediante la técnica de irradiación con microondas. Las estructuras de los compuestos se determinaron mediante análisis elemental, datos de espectro IR, 1H NMR y MS. El método Microplate Alamar Blue Assay (MABA) se ha utilizado para probar las bases de Schiff para determinar su actividad antimicobacteriana in vitro contra cepas de *M. tuberculosis* H37RV. Entre los compuestos probados, el compuesto 2a con un valor de MIC de 6,25 µg/mL y 2b con un valor de MIC de 3,125 µg/mL mostraron una mejor actividad antituberculosa y fueron comparables a la pirazinamida y la estreptomicina con un valor de MIC de 3,125 µg/mL y 6,25 µg/mL. respectivamente. El derivado sustituido con el grupo aceptor de electrones (Cl y NO2) exhibió una mejor actividad que los análogos sustituidos con el grupo donador de electrones (OH, CH3 y OCH3).

KEY WORDS*:* antitubercular activity, benzimidazole, microwave method, Schiff base, synthesis.

* Author to whom correspondence should be addressed. E-mail: aasif321@gmail.com

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