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## Synthesis and biological evaluation of pyridine derivatives as antimicrobial agents

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In this study, several pyridine derivatives were synthesized and evaluated for their in vitro antimicrobial activity against Gram-positive bacteria (*S. aureus* and *B. cereus*), Gram-negative bacteria (*P. aeruginosa* and *E. coli*) and fungus (*C. albican* and *A. niger*). The intermediate chalcone derivative was synthesized by condensation of pyrazole aldehydes with acetophenone in alcoholic KOH. Cyclization of chalcone derivative with ethyl cyanoacetate and ammonium acetate resulted in pyridine carbonitril derivatives. Furthermore, condensation of pyridine-4-carboxaldehyde with different amino-derivatives gave rise to pyridine derivatives. The oxadiazole derivative was prepared by cyclization of hydrazone containing pyridines with acetic anhydride. Characterization of the synthesized compound was performed using IR, <sup>1</sup>H NMR, <sup>13</sup>C NMR spectra and elemental microanalyses. The antimicrobial results revealed that compounds hydrazone containing pyridines and oxadiazoles exhibited half fold antibacterial activity compared to ampicillin, against *B. cereus*. On the other hand, compound chlorinated pyridine carbonitril derivative showed an equivalent activity compared to miconazole against *Candida albican* (CANDAL 03) and to clotrimazole against the clinical isolate *Candida albican* 6647. Moreover, this compound chlorinated pyridine carbonitril derivative was further tested for its acute toxicity profile. The results showed that oral LD<sub>50</sub> is more than 300 mg/kg and parenteral LD<sub>50</sub> is more than 100 mg/kg. Compound chlorinated pyridine carbonitril derivative is a good candidate for antifungal agent with good toxicity profile and deserves more chemical derivatization and clinical study.

### Biography

Hussen Dagim Ali is a Pharmacist and Medicinal Chemist working at Mekelle University, College of Health Sciences and Ayder Comprehensive Specialized Hospital as an Assistant Professor. He has an immense experience in academic, administration, research and community services. Though he is previously involved in drug discovery researches, currently he is more focusing on improving health of community through identifying gaps in the health care delivery.

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