World Academy of Science, Engineering and Technology
International Journal of Chemical and Molecular Engineering
Vol:17, No:04, 2023

Synthesis and Characterization of Some 1, 2, 3-Triazole Derivatives Containing the Chalcone Moiety and Evaluation for their Antimicrobial and Antioxidant Activity

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Abstract : Triazoles are basic five-membered ring heterocycles with an unsaturated, six-delocalized electron ring system. Since the dawn of click chemistry, triazoles have represented a functional heterocyclic core that has been the foundation of medicinal chemistry. The compounds with 1,2,3-triazole rings can be used in several fields, including medicine, organic synthesis, polymer chemistry, fluorescent imaging, horticulture, and industries, to name a few. Besides that, they found it to have health applications in the prevention and reduction of the risk of diseases, such as anti-cancer, antimicrobial, antiviral, and anti-inflammatory properties. Here, we present the synthesis of twelve 1,2,3-triazolyl chalcone derivatives (4a–l), which were produced in high yields by coupling substituted aldehydes and triazolyl acetophenone (3a–d) in ethanol. The title products were characterized by physicochemical, infrared, nuclear magnetic resonance, and mass spectral methods. The in vitro tests were used to evaluate the antioxidant and antimicrobial activity of each of the prepared molecules. The preliminary assessment and 2,2-diphenyl-1-picrylhydrazyl activity of the title compounds showed significantly higher antibacterial activity and moderate-to-good antifungal and antioxidant activities compared to their standards. This work presents the synthesis of triazolyl chalcone derivatives and their biological activity. Based on the findings, these compounds could be used as lead compounds in antimicrobial and antioxidant research in the future.

Keywords : antibacterial activity, antifungal activity, antioxidant activity, chalcone, 1,2,3-triazole
Conference Title : ICSOCMC 2023 : International Conference on Synthetic Organic Chemistry and Medicinal Chemistry
Conference Location : New York, United States
Conference Dates : April 24-25, 2023