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Solvent-free microwave assisted synthesis of oxindole derivatives as effective antifungal agents

Wijekoon H. P. S. K.¹, Palliyaguru N. P. L. N.¹, Gunasekara T. D. C. P.^{2,3},
Fernando S. S. N.², Jayaweera P. P. M.¹, Kumarasinghe K. G. U. R.^{1*}

¹Department of Chemistry, University of Sri Jayewardenepura, Sri Lanka

²Department of Microbiology, University of Sri Jayewardenepura, Sri Lanka

³Center for Plant Materials and Herbal Products Research, University of Sri Jayewardenepura, Sri Lanka

Recent emergence of microwave-assisted green synthesis as a tool of novel drug discovery is gaining much interest in the pharmaceutical field. The dielectric heating procedure found in microwave radiation has improved the atom- economy and product purity. In terms of green chemistry, reactions under solvent free condition have gained considerable attention as they reduce usage of environmentally hazardous solvents. Compounds containing oxindole pharmacophore such as 3-benzylidene-indolin-2-ones have been credited to have extensive range of biological applications. The aim of the current study was to develop novel green synthetic method in the synthesis of 3-benzylidene-indolin-2-ones from oxindole and naturally occurring aldehydes under microwave radiation. APTES ((3-Aminopropyl) triethoxysilane) modified silica was used as a solid catalyst to yield the targeted compounds within 12 minutes. Synthesized compounds (A, B, and C) were characterized by Nuclear Magnetic Resonance spectroscopy (¹HNMR), Fourier-Transform Infrared spectroscopy (FTIR), and melting point analysis. Antifungal activity of the compounds was tested against *Candida albicans* (ATCC 10231) using well diffusion assay. Compounds A, B, and C had mean zones of inhibition (ZOI) against *Candida albicans* as 20.0 mm, 20.0 mm, and 19.3 mm, respectively. Mean ZOI of miconazole positive control against *Candida albicans* was 11.3 mm. Both Minimum Inhibitory Concentration (MIC) and Minimum Fungicidal Concentration (MFC) of compounds A, B, and C against *Candida albicans* were 31.2 µg/mL, 125 µg/mL and 62.5 µg/mL, respectively. These findings revealed that 3-benzylidene-indolin-2-ones retains a significant antifungal activity against *Candida albicans*. Microwave assisted, solvent free, green synthetic method was efficiently advanced to synthesize biological active oxindole derivatives.

Key words: Microwave assisted, solvent-free, oxindole, 3-benzylidene-indolin-2-ones, anti-fungal

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*Corresponding author: upulk@sjp.ac.lk