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Environmentally benign synthesis of 2-pyrazolines and cyclohexenones incorporating naphthalene moiety and their antimicrobial evaluation

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Abstract We reported the environmental benign synthesis of chalcones, 2-pyrazolines and cyclohexanones under microwave irradiation. Chalcones were obtained by the condensation of each of 2-hydroxyacetophenone derivatives with α -naphthaldehyde under microwave irradiation. The condensation reactions of each of synthesized chalcones with phenyl hydrazine under microwave irradiation in the presence of dry acetic acid as a cyclizing agent gave 2-pyrazolines. Also, the new cyclohexenone derivatives, valuable intermediates to synthesize fused heterocycles, have been prepared by the cyclocondensation of each of hydroxychalcones with ethyl acetoacetate. The structures of the synthesized compounds were elucidated by infrared(IR) spectrometry, nuclear magnetic resonance(NMR), mass spectrometry(MS) and elemental analysis. The results indicate that unlike classical heating, microwave irradiation results in higher yields with shorter and cleaner reactions. The synthesized compounds were screened for antimicrobial activity against *Staphylococcus aureus*, *Escherichia coli*, *Candida Albicans* and *Aspergillus niger*. We clarified the effects of different substituents in the tested compounds on the obtained antibacterial activities and antifungal activities .

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