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Design, synthesis, *in vitro* antimicrobial and antioxidant activity of 3,5-disubstituted-2-pyrazolines

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Heterocyclic compounds containing pyrazoline were reported to possess worthwhile bio-activity. Taking substituted chalcones and azachalcones as the starting material two novel series of pyrazolines were synthesized by conventional heating and microwave irradiation. Claisen Schmidt condensation between intended aryl methyl ketones (1a-b) and different substituted aromatic aldehydes (2a-c) resulted in the formation of corresponding chalcones (3a-c; 4a-c) which were cyclized using hydrazine hydrate to yield final pyrazolines (5a-c; 6a-c) in good yields (59-81%). Reaction time and % yield data ratified the superiority of microwave assisted technique over classical heating. The structures of all the synthesized compounds were confirmed based on physical data, spectroscopic studies, X-ray powder diffraction and micro analysis. The infrared spectral group frequencies of chalcones and pyrazolines have been found in good correlation that approved the synthetic routes. Further, the compounds of both series (5a-c; 6a-c) have been screened against 1,1-diphenyl-2-picrylhydrazyl free radical (DPPH•) to assess their antioxidant potentials and all the compounds showed good free radical scavenging activity which is comparable to that of standard gallic acid. Similarly, the whole synthesized scaffold has also been tested for anti-bacterial and anti-fungal activities and results were compared with positive control that declared all products as good antimicrobial agents. Amongst all the tested compounds, 5a and 5b were found to be more active. The highest antimicrobial and antioxidant potential of 5a-b owed to the presence of multi-chloro groups on the phenyl rings.

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