Abstract

Heterocyclic compounds have got distinctive consideration in the last few decades due to the numerous biological activities they possess. The valuable biological activities of phenylpiperazine and benzamides prompt us to synthesize new derivatives of phenylpiperazine bearing benzamides. In this research work, synthesis and enzyme inhibition study of derivatives of 3-((4-phenylpiperazine-1-yl)-*N*-(tolyl)benzamides (**5a, 5b**) has been carried out. These derivatives were synthesized by reacting 1-phenylpiperazine with electrophiles, 3-(chloromethyl)-*N*-(tolyl)benzamides (**3a**/**3b**) in presence of dimethylformamide (DMF) and lithium hydride (LiH) under control condition. These electrophiles were prepared by reacting equimolar quantities of tolyl amines (**1a**/**1b**) with 3-(chloromethyl)benzoyl chloride (**2**) in 10% aqueous Na_2CO_3 solution. The progress of these reactions was examined by using thin-layer chromatography (TLC) in a suitable solvent system. Spectral techniques such as ^{1}H-NMR, ^{13}C-NMR and EI-MS were utilized to characterize synthesized molecules (**5a, 5b**). The enzyme inhibition study of these molecules (**5a, 5b**) was evaluated against the *tyrosinase* enzyme. The IC_{50} values demonstrated that the **5a** compound (1.19 ± 0.09 µg/ml) showed effective inhibition as it exhibited more potency against *tyrosinase* enzyme than standard kojic acid (2.59 ± 0.13 µg/ml). Whereas the **5b** compound (18.27 ± 1.82 µg/ml) exhibited a very weak inhibition against *tyrosinase* enzyme.