ABSTRACT

A new series of 5-(4-chlorophenyl)-1,3,4-oxadiazole-2-thiol derivatives was prepared from 4-chlorobenzoic acid by converting it successively into the corresponding ester, hydrazide and the oxadiazole. Finally the targeted compounds were prepared by reacting 1,3,4-oxadiazole with different electrophiles. The structures of newly synthesized compounds were confirmed by various spectroscopic techniques like ^{1}H-NMR, ^{13}C-NMR and EI-MS. All compounds were evaluated for their anti-bacterial and antifungal activity by the test method. These compounds were further evaluated for their cytotoxicity by brine shrimp method and enzyme inhibition activity against acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) enzymes by Ellman method. The compounds 2-(4-chlorophenyl)-5-(2-methylbenzylthio)-1,3,4-oxadiazole (**6g**) and 2-(3-chlorobenzylthio)-5-(4-chlorophenyl)-1,3,4-oxadiazole (**6j**) exhibited significant inhibitory activity against acetylcholinesterase (AChE) and 2-(4-chlorophenyl)-5-(4-fluorobenzylthio)-1,3,4-oxadiazole (**6h**) showed moderate activity against butyrylcholinesterase (BChE). 5-(4-chlorophenyl)-1,3,4-oxadiazole-2-thiol (**4**) exhibited good MIC (Minimum inhibitory Concentration) value against two gram positive namely *Staphylococcus aureus* and *Micrococcus luteus,* four gram negative namely *Escherichia coli, Enterobacter aerogenes*, *Bordetella bronchiseptica* and *Salmonella typhimurium* and against three fungi strain namely *F. solani, A. flavus* and *A. Fumigates.*