ABSTRACT

Hetrocyclic chemistry is an important field of organic chemistry due to the therapeutic potential. The minor modification in the structure of poly-functional compounds containing hetro-atoms like oxygen, sulfur and nitrogen has therapeutic ability so, these compounds are widely used in the medicines as antifungal and antibacterial agents. A series of 1-[(4-{[(5-substituted-1,3,4-oxadiazole-2-yl)sulfanyl]methyl}phenyl}sulfonyl}-3-methylpiperidine (**8a-p**) was synthesized from the reaction of oxadiazoles (**4a-p**) and 1-(4-Bromomethylbenzenesulfonyl)-3-methyl piperidine. The oxadiazoles (**4a-p**) were synthesized by series of reaction of different organic acids into correspondingly esters (**2a-p**), hydrazides (**3a-p**) and oxadiazoles (**4a-p**). Then electrophile (**7**) was prepared by the reaction of 3-methyl piperidine (**5**) with 4-Bromomethylbenzenesulfonyl chloride (**6**) in the presence of water and Na_2CO_3 to maintain the pH around 9-10. Structural elucidation for all the synthesized compounds was executed by different spectroscopic analysis techniques like IR, ^{1}H-NMR and EI-MS. All the synthesized derivatives were screened for antibacterial activity. Anti-bacterial activity was assayed against gram-negative bacteria (*S.typhi, E.coli* and *P.aeroginosa*) and gram-positive bacteria (*B.subtilis* and *S.aerus*) all the compounds were active against bacteria under study. Synthesized Compound **8k, 8f** and **8i** exhibited excellent inhibitory potential against *E.coli* (-), *B. subtilis* (+) and *S. typhi* and compound **8d** which is phenyl substituted exhibited excellent inhibitory potential against *S. typhi* (-),*B. subtilis* (+) and *P. aeruginosa* (-). Compound (**8o**) exhibited the very excellent inhibitory potential against *E.coli* (-) with MIC value of 8.79±0.49. Anti-enzymatic activity was assessed against urease enzyme alpha-Glucosidase, chymotrypsin and trypsin. Compound **8h** was most active against urease enzyme.