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RESEARCH ARTICLE

Green Synthesis of Novel ethyl 3-amino-5-(methylthio)-4-(5-substituted phenyloxazol-2-yl)thiophene-2-carboxylate derivatives

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ABSTRACT:
Synthesis of novel ethyl 3-amino-5-(methylthio)-4-(5-substituted phenyloxazol-2-yl) thiophene-2-carboxylate derivatives from 3-amino-4-carbamoyl-5-(methylthio)thiophene-2-carboxylate was carried out by traditional as well as microwave irradiation green protocol. Ethyl 3-amino-5-(methylthio)-4-(5-substituted phenyloxazol-2-yl) thiophene-2-carboxylate derivatives were screened for antimicrobial screening against gram positive bacteria Staphylococcus aureus (ATCC 29737), gram negative bacteria *Escherichia coli* (ATCC 25922), *Pseudomonas aeruginosa* (ATCC 27853) and *Candida albicans* (MTCC 277), *Aspergillus niger* (MCIM 545) fungi.

KEYWORDS: Green synthesis, oxazole derivatives, thiophene-2-carboxylate, antimicrobial screening, microwave irradiation.

1. INTRODUCTION:
Synthesis of substituted oxazole derivatives is important because of their diverse range of biological activities in pharmaceutical areas[1]. Substituted oxazoles are important heterocycles that are biologically active molecules and synthetic bioactive molecules as well as in a number of organic building blocks including natural products, agrochemicals and pharmaceutical drugs[2,3]. Many of oxazole containing compounds like Martfragin A and Almazol D had been isolated from plants *Martensa fragile* and marine natural origins such as red algae[4]. Oxazole-containing compounds have been used as diabetes II treatment e.g. Aleglitazar, platelets aggregation inhibitor e.g. Ditazole, as part of tyrosine kinase inhibitor such as Mubritinib, and as COX-2 inhibitors such as Oxaprozin[5]. The wide range of biological activities of oxazoles includes antibiotics[6], antiproliferative[7], anti-inflammatory[8], analgesic[9], antibacterial, antifungal[10], hypoglycaemic, antiproliferative, muscle relaxant[11-12], HIV inhibitor activity[13], RNA binding ligand activity[14] and anti-tuberculosis[15]. Oxazole derivatives used as pesticides, fluorescent whitening agents, lubricants, dyes and pigments[16-18]. In addition, oxazole derivatives are useful synthetic intermediates and can be used as diversity scaffolds in combinatorial chemistry[19] and also as peptidomimetics[20]. Thiophene substituted oxazole containing α-alkoxyacid derivatives were reported as dual PPARα/γ agonists[21]. Thiophene substituted oxazole derivatives have proven their potency and selectivity as renal (A498), lung (NCI-H226), kidney (CAKI-1), and breast (MDA-MB-468, MCF7) carcinoma cell lines[22]. Thiophene containing oxazole and isooxazole compounds have been reported to exhibit anti-depressant, antianxiety activities, MAO inhibitors[23]. The biological activities of the thiophene based oxazole nucleus such anti-inflammatory, analgesic, antibacterial, antifungal anti-tuberculosis, muscle relaxant and HIV inhibitory properties have been explained in literature[24].

2. MATERIALS AND METHODS:
All the chemicals and solvents have been purified by standard literature procedures and moisture was removed from the glass apparatus using $CaCl_2$ drying tubes. The melting points determined in open capillary tubes with

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