Synthesis of New conjugative derivatives of 2-{2-butyl-1-[2-(3`,4`-substituted benzyl)-1-methyl-*1H*-benzimidazole-5-carbonyl]-4-methyl-6-oxo-1,6-dihydropyrimidin-5-yl}-N,N-dimethylacetamides and their antimicrobial activities

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ABSTRACT

A series of benzimidazole derivatives were synthesized using simple approachfrom2-(2-butyl-1,6-dihydro-4-methyl-6-oxopyrimidin-5-yl)-N,N-dimethyl acetamide with various 2-(3,4-substituted benzyl)-1-methyl-*1H*-benzimidazole-5-carbonyl chlorides in presence ofsodium hydride in N,N-dimethyl formamide for 18 to 36 hours at room temperature with good yield.All the compounds were screened for their antimicrobial activities on selected pathogens. The synthesized derivatives (**3a-j**) showed good antibacterial activity against *B. subtilis* with the highest zone of inhibition and also good against *E.coli* and *P.aeruginosa*. Moreover, the compounds also possess good antifungal activity against *C. albicans*.

Keywords:-2-(2-butyl-1,6-dihydro-4-methyl-6-oxopyrimidin-5-yl)-N,N-dimethylacetamide, 2-(3,4-substituted benzyl)-1-methyl-*1H*-benzimidazole-5-carbonyl chlorides,antibacterialactivity, antifungal activity.

1.INTRODUCTION

Benzimidazole [1]is an important class of heterocyclic compounds, that have several applications in pharmaceutical chemistry and drug development. The most prominent benzimidazole compound in nature is N-ribosyl-dimethylbenzimidazole, which serves as an axial ligand for cobalt in vitamin B12 [2].

The incorporation of benzimidazole nucleus, a biologically accepted pharmacophore in medicinal compounds, has made it a versatile heterocyclic moiety possessing wide spectrum of biological activities in a number of fields: analgesic[3-5]anti-inflammatory[4-7], antibacterial [8], antifungal [9], antiviral[10,11], anti-helmenthic [12], anticonvulsant [13,14], anticancer [15,16], antiulcer [17] and antihypertensive [18].There are many drugs based on benzimidazoles currently in the market such as rabeprazole (anti-ulcer), pimozide (antipsychotic), telmisartan (antihypertension), omeprazole (proton pump inhibitor), pimobendan (ionodilator), and mebendazole (antihelmintic) (**Fig. 1**).

Pyrimidine heterocyclic core has a great value in medicinal chemistry since it comprises the base for thiamine, uracil and cytosine nitrogen bases which are the building blocks of the nucleic acids [19,20]. Furthermore, pyrimidine derivatives have registered their importance in the development of various pharmaceuticals of broad spectra of therapeutical activities such as: anti-microbial [21], anti-viral, anti- HIV,anticancer [22,23], anti-tubercular [24], anti-malarial [25], analgesic, anti-inflammatory [26], diuretic [27], cardiovascular [28], hypnotic for the nervous system [29,30], and antioxidantactivities [31].

Synthesis of some new conjugative derivatives of 2-[1-(3',4'-substituted-biphenyl-4-carbonyl)- 2-butyl-4-methyl-6-oxo-1,6-dihydro-pyrimidin-5-yl]-N,N-dimethyl acetamides and their evaluation of antimicrobial and *in vitro* anticancer activities

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Abstract

A series of ten new conjugative derivatives of 2-[1-(3',4'-substituted-biphenyl-4-carbonyl)-2-butyl-4-methyl-6-oxo-1,6-dihydro-pyrimidin-5-yl]-N,N-dimethyl acetamide derivatives (**3a-3j**) starting from 2-(2-butyl-1,6-dihydro-4-methyl-6-oxopyrimidin-5yl)-N,N-dimethylacetamide (**1**) with 3`,4`-substituted-biphenyl-4-carbonyl chloride (**2a-j**) in dimethylformamide with good yields. The compounds were screened for antimicrobial and *in vitro* anticancer activities. The synthesized pyrimidine-biphenyl derivatives (**3a-3j**) possess superior antimicrobial activity against selected pathogens. All derivatives **3a-3j** were tested against three cancer cell lines, HEPG-2, MCF-7 and HCT116 cancer cell lines were investigated by MTT assay. Compound **3b** showed highest activity against HEPG2 cancer cell line. The compound **3e** showed more potent activity against MCF-7 and HCT116 cancer cell lines.

Keywords: 2-(2-butyl-1,6-dihydro-4-methyl-6-oxopyrimidin-5yl)-N,N-dimethyl acetamide, 3`,4`-substituted-biphenyl-4-carbonyl chloride, antimicrobial activity, *in vitro* anticancer activity.

1. INTRODUCTION

Biphenyl is a neutral molecule and fairly non-reactive due to lack of functional group. However, biphenyl participates in many of the reactions that are typical for benzene, for example, substitution reactions upon treatment with halogens in the presence of a Lewis acid. Also, it is required to convert biphenyls into the structural analogs containing the active groups in order for it to be able to use for synthetic intermediate for the production of a host of other organic compounds such as emulsifiers, optical brighteners, crop protection products, plastics and pharmaceuticals.[1] For this, it is important to consider the o, p-directing and/or m directing effect, especially when substitution at a specific position is desired i.e. mono, di-, tri- or tetra- substitutions. It is possible to acetylate the carboxylic part, also various other

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An Interval-Valued Trapezoidal Intuitionistic Fuzzy TOPSIS Approach for Decision-Making Problems

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Abstract

The Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) is a well-known multi-criteria decision-making strategy that has been widely used in research decision-making problems. Furthermore, interval-valued trapezoidal intuitionistic fuzzy sets (IVTrIFSs) have a consecutive domain, which allows for efficient uncertainty management. Hence, an IVTrIF TOPSIS method is proposed in this study. TOPSIS is a method for selecting and comparing alternatives based on similarity/distance measurements. Hence, a new ranking method based on the Dice similarity metric was developed and the properties of the similarity measure were validated. Further, the problem of selecting the best business venture is solved using the suggested approach. The best alternative is found. The results are compared to those of previous technique IVTrIF combinative distance-based assessment method. From the result analysis, it is noticed that the proposed method can be used as an alternative to solve decision-making problems in IVTrIF contexts.