INTERNATIONAL RESEARCH JOURNAL OF PHARMACY **ISSN 2230 – 8407**
Available online http://www.irjponline.com
Review Article

A REVIEW ON SYNTHESIS OF SCHIFF'S BASES OF 2-AMINO 4-PHENYL THIAZOLE

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Article Received on: 11/04/2011 Revised on: 10/05/2011 Approved for publication: 23/05/2011

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ABSTRACT
Thiazoles and their derivatives exhibit a wide variety of biological activities like anti diabetic, anti inflammatory, anticonvulsants etc. In the present study we have synthesized some substituted thiazoles. These compounds were evaluated for various biological activities like Anti-diabetic, anti-inflammatory, anti-fungal activity. 2-aminothiazoles are known mainly as biologically active compounds with awide-ranging activity of intermediates in the synthesis of antibiotics and dyes. The extensive synthetic possibilities of these heterocyclic due to the presence of several reaction sites hold promise for the preparation of new thiazoles derivatives and expansion of the range of application of these compounds. Thiazole derivatives were prepared by one-pot procedure by the reaction of haloketones, thiourea and substituted *o*-hydroxybenzaldehyde under environmentally solvent free conditions.
Key Words: Amino thiazoles, antibacterial and antifungal activity, antiinfammating.

INTRODUCTION

The present work deals with synthesis and evaluation of substituted thiazoles (amino thiazoles) and their derivatives of biological interest and also represents some of the salient aspect of the application of organo sulphur compounds in particular[1].

Nitrogen containing heterocyclic with sulfur atom is an important class of compounds in medicinal chemistry. Thiazoles being an integral part of many potent biologically active molecules such as sulfathiazole (Antimicrobial drug), Ritonavir (Antiretroviral drug), Abafungin (Antifungal drug) with trade name Abase cream and Bleomycin and Tiazofurin (Antineoplastic drugs) have been explored previously[2]. Thiazoles are important class of natural and synthetic compounds. Thiazole derivatives display a wide range of biological activities such as cardiotonic, fungicidal, sedative, anesthetic, bactericidal and anti-inflammatory. The synthesis of thiazole derivatives is important of their wide range of pharmaceutical and biological properties[3].

Research over the past 50 years has been focused on meeting medical needs to treat infectious disease caused by life threatening pathogens. In spite of the introduction of a variety of antibacterial agents in multiple unrelated drug classes, resistance continues to emerge. The pharmaceutical field (including academic) must respond to these clinical challenges by bringing forward stream of new agents with promising antibacterial activity against bacteria, Advantages of these agents include their higher predictability for success, well-defined biomarkers, shorter clinical trials, and shorter duration of therapy leading to fewer long-term safety concerns[4].

Due to the rapid development of bacterial resistance to antibacterial agents, it is vital to discover novels scaffold for the design and synthesis of the new antibacterial agents to help in the battle against pathogenic microorganisms. Much research has been carried out with the aim to discover the therapeutic values of thiazole derivatives. A number of these compounds are today's blockbusters of the antibacterial market due to their therapeutic efficacy having tolerable side-effects and thus, challenging the predominance of well established β- lactum antibiotics which are becoming more prone to the resistant pathogenic bacteria. Thiazoles are thus important molecules. They exhibit a variety of activity from antimicrobial to antitumor activity[5].

PHARMACOLOGICAL ACTIVITY

Antibacterial Activity

The compounds were tested *in-vitro* for their antibacterial activity against two microorganisms viz. *Escherichia coli* (NCTC 10418), and *Staphylococcus aureus* (NCTC 6571) which are pathogenic in human beings.

Method: Disc Agar diffusion method using Mueller-Hinton agar using *E.coli, S.aures*[1].

All the synthesized 2-aminophenylthiazol was tested for their antibacterial activity *in vitro* against

Staphylococcus aureus, Shigella paratyophi, Escherichia coli, Vibrio. *Cholera* and *Shigella sonnei* at concentration of 100µg/ml, 250µg/ml, 500µg/ml and 750µg/ml. Streptomycin was used as a standard drug at concentration of 100µg/ml, 250 µg/ml, 500 µg/ml and 750 µg/ml. In general, all the synthesized 2-aminophenylthiazole exerted a wide range of modest in vitro antibacterial activity against all the tested organisms at all the concentrations. All the compounds were comparable in their activity with the activity of the standard drug against the Gram positive bacteria *Escherichia coli* at all the concentrations[2].

Antifungal Activity

The compounds were tested *in-vitro* for their antifungal activity against *Candida albicans* (ATCC 10231) and *Aspergillus niger* (ATCC 16) Method: Cup-Plate agar diffusion method using Sabourauddextrose agar using *C. albicans and A. niger*[1].

The in vitro antifungal activity of all synthesized 2-aminophenylthiazol were studied against the fungal strains viz.*; Aspergillus niger* and *Candida albicans* at a concentration of 100µg/ml. Carbendazim was used as a standard drug at a concentration of 100µg/ml[2].

Antianthelmintic Activity

The above screened compounds were tested for anthelmintic activity. 0.1 % 0.2 %, 0.5 % concentrations and test compounds showed comparatively better death time of earthworms with that of standard drug. After all, the synthesized compounds in overall estimation confirm the better activity against peritum posthuma[6].

Anti-Inflammatory Activity

Edema was produced by using type IV lambada Carrageen and from sigma laboratories. Foot volumes were measured in Plethysmometer by water displacement. The instrument was calibrated before performing the experiment using standard calibrated probe number and standard drug used Nimesulide was obtained from Lincoln Pharmaceutical ltd. Ahmadabad[7].

Cartagena induced rat paw oedema method was used. Carrageen an solution (1%w/v) in distillation water was prepared and injected (0.1 ml) in sub planter region to induce paw edema[8].

The anti-inflammatory activities of new compounds were determined by λ-Carrageen an-induced mice paw edema method using diclofenac sodium as a standard[9].

CONCLUSION

A Series of novel 2-amino substituted phenyl thiazole were synthesized and the structure of the entire compound was confirmed by recording by their1H NMR, Mass spectroscopy, and IR spectra. The entire newly synthesized compounds were screened for their in-vitro antibacterial and antifungal, Antianthelmintic, anti-inflammatory properties. In summary, we have developed a simple, convenient and effective method for easy synthesis of thiazole derivatives by the condensation of *o*-hydroxybenzaldehyde, 2'-hydroxy substituted -haloketones and thiourea under solvent free conditions. Present methodology offers very attractive features such as reduced reaction times, higher yields and environmentally benign condition.

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