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## Biological Activities of Some 1, 4-Thiazine-1, 1-Dioxide: Medicinal Chemistry

P. Bhavani

Research Scholar, Department of Chemistry, Queen Mary's College, Chennai, India

### Abstract:

*A survey of green synthesis of thiazines revealed the moiety have attracted a great deal of interest of medicinal chemists, biochemist, and pharmacologist and rendered as a lead molecule for designing potential bioactive agents. This review accompanying supplementary green, synthetic information & its references would extend a great deal of help to researchers in determining the best and most productive, economical, suggestive and clinically important compound of thiazine derivatives which will be expected to show potent pharmacological activities. This has led to the discovery of a wide variety of compounds that are of high interest from the point of view antimicrobial, antimycobacterial, antidiabetic and antidepressant effects among others. The structural assignments are based on their elemental and spectral data. All the synthesized compounds were preliminarily screened for their in vitro antimicrobial activity against Gram positive organisms (*Bacillus subtilis*, *Staphylococcus aureus*) and Gram negative organisms (*Escherichia coli* and *Klebsiella pneumonia*) and antifungal activity for *Aspergillusniger* and *Aspergillusfumigatus* by disc diffusion method.*

### 1. Introduction

Heterocycles are important constituents of natural compounds, synthetic medicines and are known to play a vital role in a number of chemical and biochemical processes. Thiazines are six membered cyclic compounds containing sulfur and nitrogen atoms at 1,2; 1,3 & 1,4 positions.

A survey of green synthesis of thiazines revealed the moiety have attracted a great deal of interest of medicinal chemists, biochemist, and pharmacologist and rendered as a lead molecule for designing potential bioactive agents. This review accompanying supplementary green, synthetic information & its references would extend a great deal of help to researchers in determining the best and most productive, economical, suggestive and clinically important compound of thiazine derivatives which will be expected to show potent pharmacological activities. This has led to the discovery of a wide variety of compounds that are of high interest from the point of view antimicrobial, anti mycobacterial, anti diabetic and antidepressant effects among others. Heterocyclic chemistry comprises at least half of all organic chemistry research worldwide. The large numbers of biologically active molecules that contain heterocyclic rings has played important roles in the drug discovery process and exhibit various biological activities. A literature survey identified several design and derivatives in the development phase as potential new drugs. The versatility of the design and in addition to its relative chemical simplicity and accessibility, makes these chemicals amongst the most promising sources of bioactive compounds.

The present invention is concerned with 1,4-Thiazine 1,1-DI oxide and their derivatives, more particularly, the diverse biological effects caused by incorporation of nitrogen or sulfur and in five or six membered heterocyclic ring the 'core' chromosphere have been one of the main strays of structural and chemical modifications of this class of compound. The above compound gives the maximum evaluation of antibacterial activities antifungal, and ant HIV activities of compounds against various strains of the bacteria for eg, *Straphylococcus aureus*, *straphylococcus faecalis*, *klebsiella coli* was carried out.

### 2. Origin of the Research Problem

More than 90% of the new drugs contain Heterocycles and the interface between chemistry and biology, at which so much new scientific insight, discovery and application are taking place is crossed by heterocyclic compounds. The most active heterocycles that have shown considerable biological action, such as antibiotic, antifungal, anti-inflammatory, antiviral, anticancer, anticonvulsant, anthelmintic, antihistamine, antidepressant activities. Heterocycles from by far the largest of Classical division of organic chemistry and is of immense importance biologically and industrially. In industrial application ranging from cosmetic, reprography information storage and plastics are heterocyclic in nature. One striking structural feature inherent to heterocycles which continue to be exploited to great advantages by the drug industry

The presence of heterocycles in all kinds of organic compounds of interest in electronics, biology, optics, pharmacology, material science, and so on is very well known among them, sulfur and nitrogen containing heterocyclic compounds have maintained the interest of researchers through decades of historical development of organic synthesis. The ability of many heterocycles to produce stable complex with metal ions has great biological significance. The presence of different heteroatoms makes tautomerism ubiquitous in the heterocyclic series. Such versatile reactivity links to the electronic distributions in the heterocyclic

molecules. Synthetic heterocycles have widespread therapeutic uses such as antibacterial, antifungal, anti-HIV activity, genotoxic, herbicidal, muscle relaxants.

### 3. Interdisciplinary Relevance

The area of organic Synthesized thiazine molecules is highly interdisciplinary which involves synthesis of highly used thiazine derivatives. Design and its derivatives having antimicrobial activity, antibacterial activity, antifungal and so on the interdisciplinary which also involve Sonication, ultrasonic method NLO and their characterization involves, spectroscopy and various advanced techniques like NLO, XRD, Docking studies, biological studies. Their biological application for HIV treatment involves biotechnology and biochemistry. Thus the area of organic synthesized thiazine molecules is highly interdisciplinary which involves the pharmacological and biomedical research.

### 4. Review of research and Development in the subject.

Heterocycles plays an important role in biochemical processes because the side group of the most typical and essential constituents of living cells, DNA and RNA are based on aromatic heterocycles which have medicinally important sulfur and nitrogen containing heterocyclic system is tetrahydro-1,4-thiazine.

### 5. National Status

Some thiazine research successfully going in indiaz: JSS college of pharmacy, Anna university, Udhamandalam (ooty), Annamalai university and the current research compound possessing pyrimido-thiazine central core has been the focus of great interest the research going on Maharashtra for various biological activity, microwave method widely used for synthetic organic chemistry thiazine molecules are an important class of heterocyclic compounds being studied by many researchers, and reported to possess a wide spectrum of biological properties such as antibacterial, antifungal, anti-HIV, herbicidal. Moreover, thiazine nucleus is a pharmacophore of cephalosporins that occupy a very important place in the field of antibiotics.

### 6. International status

The microwave technique is being biologically approved in the USA, Netherlands, Japan, France and its activity approval for use in many other countries. Further scientists belonging to these countries have been trying extensively in the improvement of this technique in order to enhance more application. In international status, the technique is not only present in microwave but also contains many other techniques like NLO, Retrosynthesis analysis, XRD, NMR, Docking studies and so on.

### 7. Conclusion

One such class of compounds are 1,2-thiazine which possess two important pharmacophores, -NH and -SO<sub>2</sub> generally the synthesized thiazine compounds have been screened more biological studies. Thiazine derivatives are also used in the preparation of peptide resin inhibitors and good color photographic materials. Thiazine dye contains greatest industrial significance (Dye methylene blue) which is widely used for coloring paper for the production of colored pencils and printing inks which are also used in medicine. By NLO study we can do "synthesis and characterization of organic nonlinear optical material of chromophores has to simultaneously possess the following criterion, high microscopic molecular, non-linearity, good thermal stability and photo stability, low adsorption and so on. The organic molecule chromophore were calculated using semiempirical method. The effect of conjugation length and gradient donor system was investigated on the microscopic nonlinear optical properties and the energy.

### 8. References

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