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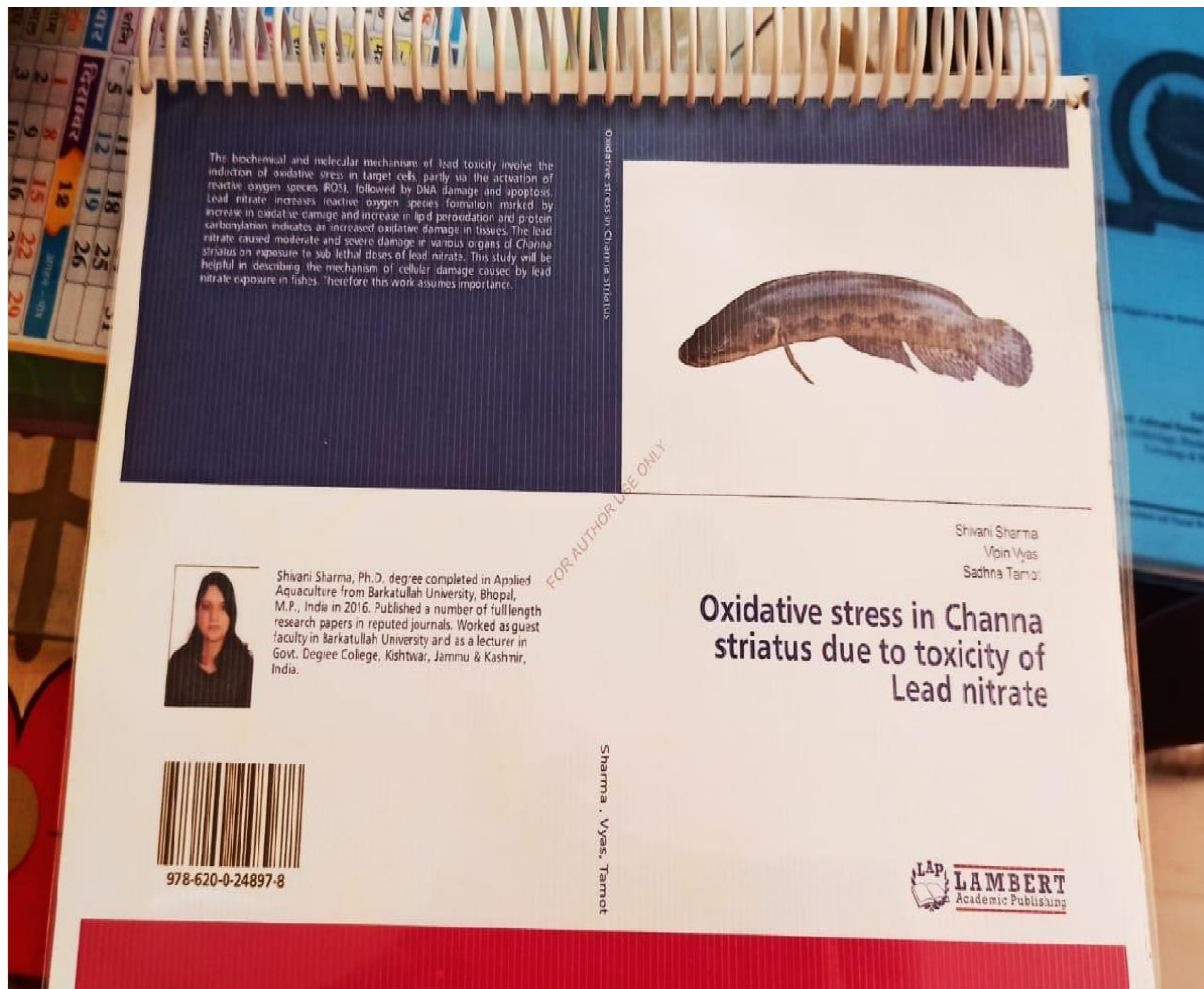

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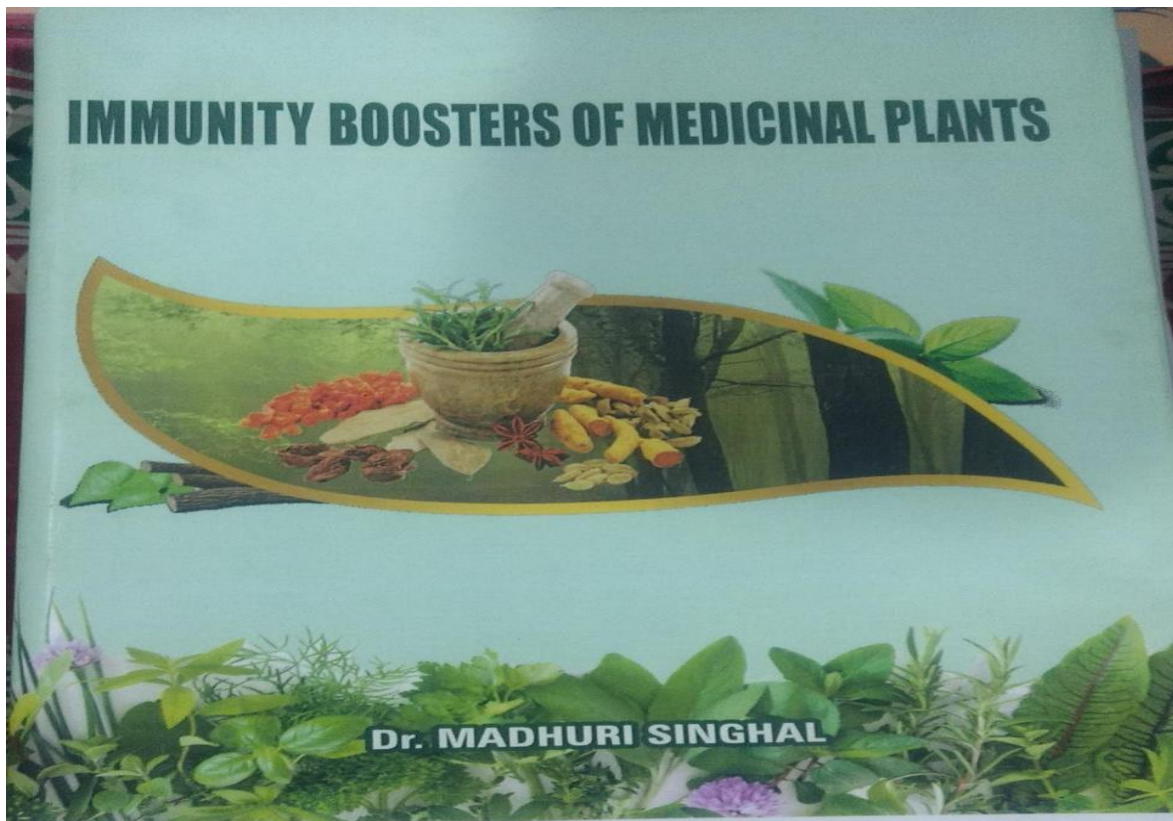

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Cover Page – Immunity Boosters of Medicinal Plants




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IMMUNITY BOOSTERS OF MEDICINAL PLANTS



Edited By
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Professor of Chemistry
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Phytochemistry and Phytochemical Activities of *Swertia chiraita*

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Abstract

Swertia chiraita is one valuable herb which is used as single drug and in compound formulations for treatment of various diseases. It is also used as nutritive supplement. In traditional medicine whole plant is used but the richest source of active phytochemicals is the root of plant. The major chemical constituent of *Swertia* are xanthenes, other secondary metabolites such as flavonoid and triterpenoids are also active constituents of this plant. This article briefly reviews phytochemistry, biological activity and pharmacological effects of *S. chiraita*.

Introduction

Herbal drugs have become increasingly popular and their use is widespread. Various medicinal plants have been used for years in daily life to treat disease all over the world. Traditional medicinal plants have been used all over the world and they play an important role in preventing and treating of various diseases. Plants belonging to the families Gentianaceae are best known for their bitter taste and used in traditional remedies against loss of appetite, fever and are still included in many tonic formulations. *Swertia chiraita* is an important member of this family. It is an erect, herbaceous, robust herb found in eastern temperate Himalayas at 1500-3000m altitude (Sapkota Sabita et al.). It is found in Uttarakhand, Himachal Pradesh, Kashmir, Bhutan and in Nepal. *Swertia* is commonly known as chiraita in indigenous system of medicine. Different vernacular names are Kirata, Chirta, Chirata, Chireta, Chirata Kaddi, Kiraita, Chireita, Chiraita, Chirayita etc. It is also known as Nepali neem. It is an ancient herb introduced to Europe in 1839. It is used in the treatment of variety of ailments. In India, 40 species of *Swertia* are recorded of which, *Swertia chiraita* is considered the most important for its medicinal properties.

A Review on Phytochemistry and Pharmacological Properties of *Nyctanthes arbor-tristis*

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Abstract

Nyctanthes arbor-tristis commonly known as 'Harsingar' is an important traditional medicinal plant mainly used in Ayurveda. Different parts of this plant are used for various medical purposes. It contains various phytochemicals like glycosides, alkaloids, essential oils, tannins etc. Several studies are being carried towards its pharmacological properties like antibacterial, antifungal, antipyretic, antioxidant and hepatoprotective activities. Present review includes comprehensive information on the chemical constituents, phytochemistry and pharmacological properties of *Nyctanthes arbor-tristis*.

Introduction

Medicinal plants are widely used as single drug or in combination for health care system. Ayurveda is one of the oldest system of medicine, it uses plants and their extracts for the treatment and management of various diseases. *Nyctanthes arbor-tristis* Linn. is one of the most useful traditional medicinal plants in India. *Nyctanthes* means "Night Flowering" and is commonly known as Harsingar, Parijata, Shefali, Kannika, Coral Jasmine and Night Jasmine. It is a shrub or small tree growing upto 10 m with flaky grey bark belonging to the family Oleaceae (Milind et al.). *N. arbor-tristis* widely cultivated in tropical and subtropical regions all over the world. It is often cultivated in gardens due to its most pleasant and peculiar fragrance. *Nyctanthes arbor-tristis* are found in India, generally in the Himalayan districts and south of Godavari. It is distributed widely in sub-Himalayan regions and Southwards to Godavari.

Phytochemical and Therapeutical Evaluation of *Datura stramonium* – A Review

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Abstract

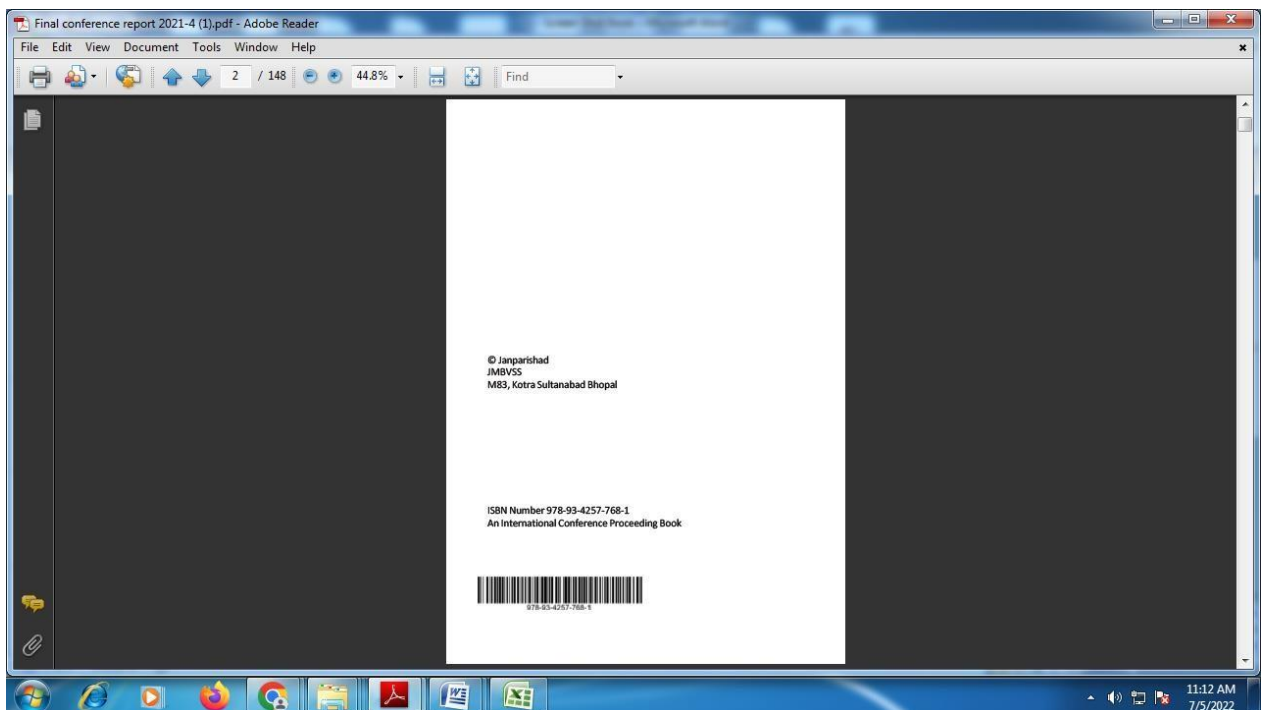
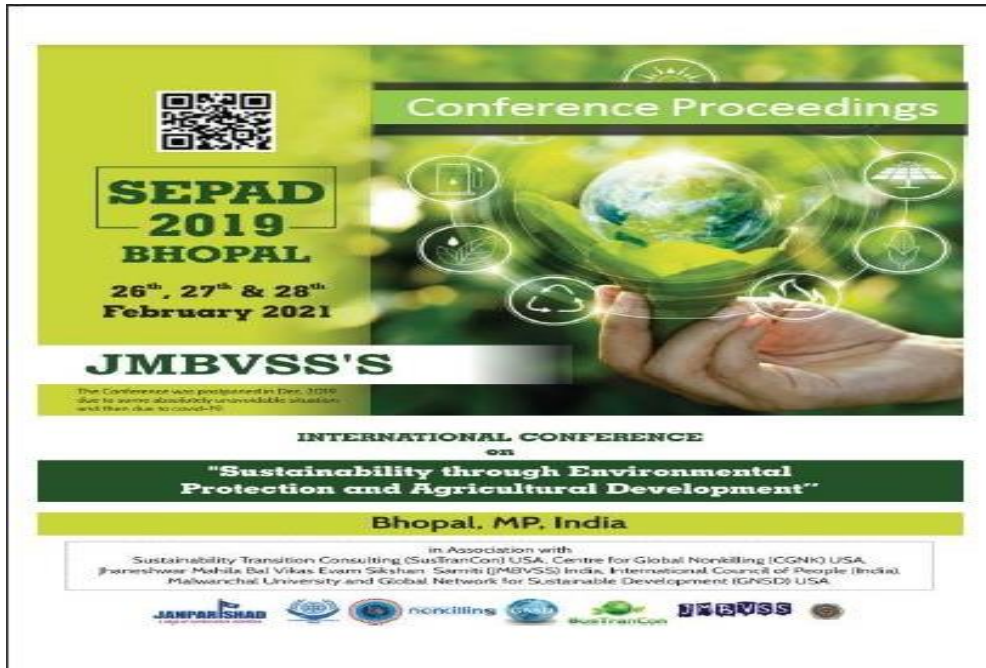
India has a wealth of natural plant drugs that have great potential for pharmaceutical activities. *Datura stramonium* is one of the well-known medicinal herbs. It is a wild plant having various medicinal and pharmacological properties. The plant shows various types of activities such as antimicrobial, anti-asthmatic, antifungal, antioxidant, anticancer that may be due to the presence of the active chemical constituents. *Datura stramonium* contains biologically active substances like alkaloids, atropine, scopolamine, tannin, carbohydrate and proteins. The present review is focused on the pharmacological studies of the *Datura stramonium*.

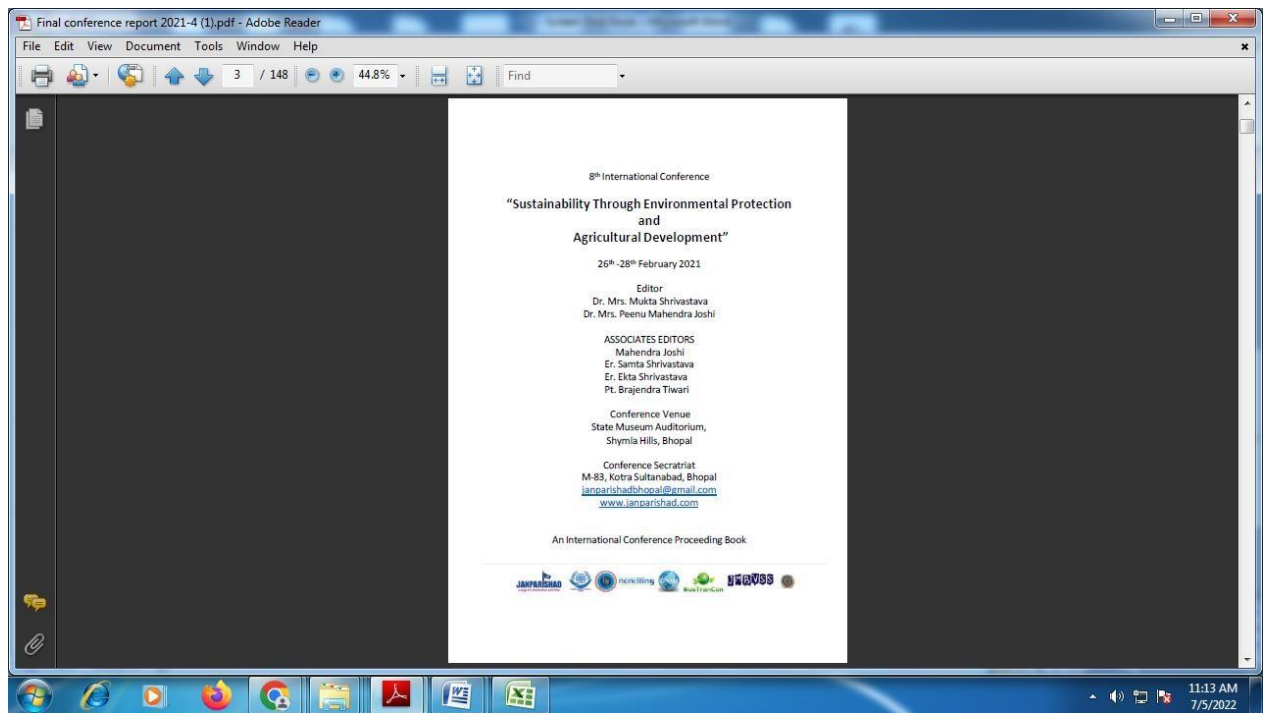
Keywords: *Datura stramonium*, pharmacological, medicinal, potential

Introduction

Plants have always played a major role in the treatment of human injury and diseases worldwide. The demand for medicinal plants is growing in both developed and developing countries due to interest in natural ingredients. Herbal medicine is an integral part of the traditional and modern medicines system [1]. *Datura stramonium* is also an important medicinal plant. Traditionally it has important medicinal value throughout the world. *Datura stramonium* is commonly known as Jimson weed and belongs to family Solanaceae [2]. *Datura stramonium*, the most common species within this family, is native to Asia, but is also found in the United States, Canada, and the West Indies. It is widespread with higher

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Synthesis, Characterization and Biological Behaviour of Cu(II) Complex derived from Tridentate Schiff Base 2-N-(salicylaldimine)-6-ethoxybenzothiazole

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Abstract

Schiff base ligands are essential in the field of coordination chemistry, especially in the development of complexes of Schiff bases because these compounds are potentially capable of forming stable complexes with metal ions. Condensation reactions of 2-N-(salicylaldimine)-6-

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Studies of a NGS Donor Schiff Base Ligand- Metal Complex
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Abstract
 A new Schiff base has been synthesized from 2-aminobiphenyl and salicylaldehyde. metal complex of the Schiff base was prepared from chloride salt of Ni(II) in alcoholic medium. Metal complex was characterized by several physical tools in particular: IR, UV, ¹H NMR, molar conductance, magnetic moment and thermogravimetric studies. On the basis of elemental and spectral studies, six coordinated geometry was assigned to these complexes. In the presence of these results, it is suggested that this ligand acts as tridentate ligand coordinating to the metal via azomethine nitrogen, nitrogen of the phenolic (-OH) group and oxygen atom of phenoxide (O⁻).
 Keywords: 2-aminobiphenyl, salicylaldehyde, Schiff base, metal complex, spectral studies

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Complexation Studies of Omeprazole, An Anticancer Drug With Platinum
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Abstract
 Omeprazole (OME) is a proton pump inhibitor (PPI). PPIs have enabled to improve the treatment of various acid-peptic disorders. OME is a weak base and it can form several complexes with transition and non-transition metal ions. The present investigation reports synthesis of Platinum (II) complex of with Omeprazole i.e. 5-amino-2-[(4-oxo-1,2,3,4-tetrahydro-5H-benzothiazol-5-ylidene)imidazole-1H-beta-carbonyl]imidazole. Analytical data and stoichiometry suggest ligand-metal ratio is 2:1 for Pt(II) complex. The complex has been synthesized, characterized and the structure assigned to the complex is supported by infrared spectral studies. The molar conductance measurement of the complex in DMSO indicate that the complex is non-electrolytic in nature. The spectroscopic results show the involvement of C=N and S=O group in coordination to the central metal ion.
 Key words: Omeprazole, PPI, Metal-Complex, Stoichiometry, Infrared studies, Molar conductance

INTRODUCTION
 Omeprazole (OME) is a very common PPI. PPIs have demonstrated gastric acid suppression superior to that of histamine H₂ receptor blockers^{1,2}. The literature reveals that a large number of drugs have been used to synthesize the complex with many metals with a view to enhance their therapeutic action³. Considering the importance of drugs and their complexes it has been desired to synthesize and study the metal complex of Omeprazole with metals. The present paper describes the synthesis and characterization of Pt(II) complex with 5-amino-2-[(4-oxo-1,2,3,4-tetrahydro-5H-benzothiazol-5-ylidene)imidazole-1H-beta-carbonyl]imidazole.

MATERIALS AND METHOD
 All chemicals used were of AR grade. Pure sample of Omeprazole having molecular formula, C₁₆H₁₄N₂O₄S and molecular weight 345.42 gm/mol was obtained from Auro Pharmaceutical Ltd, Mandla, Bhopal. Metal salt was of Merck Chemicals. Melting point of Omeprazole is 156°C and the solvent used were acetone and distilled water. Metal-ligand ratio was calculated using Systronic digital conductivity meter. IR spectra were obtained from CDRI Lucknow.

LIGAND-METAL RATIO AND STOICHIOMETRY
 To confirm the ligand-metal ratio, conductometric titrations using mono-variation method were carried out at 25°C. 0.01 M solution of Omeprazole drug was prepared in 70-30 mixture of methanol and water. 20 ml of ligand was diluted to 100 ml with the same solvent. The ligand was titrated against 0.02 M metal solution using mono-variation method and conductance was recorded after each addition of metal salt. Graph is plotted between corrected conductance and volume of added metal salt. From the equivalence point in the graph, it has been concluded that the complex formation of the ligand and Pt(II) metal takes place in the ratio of 2:1 (L: M).

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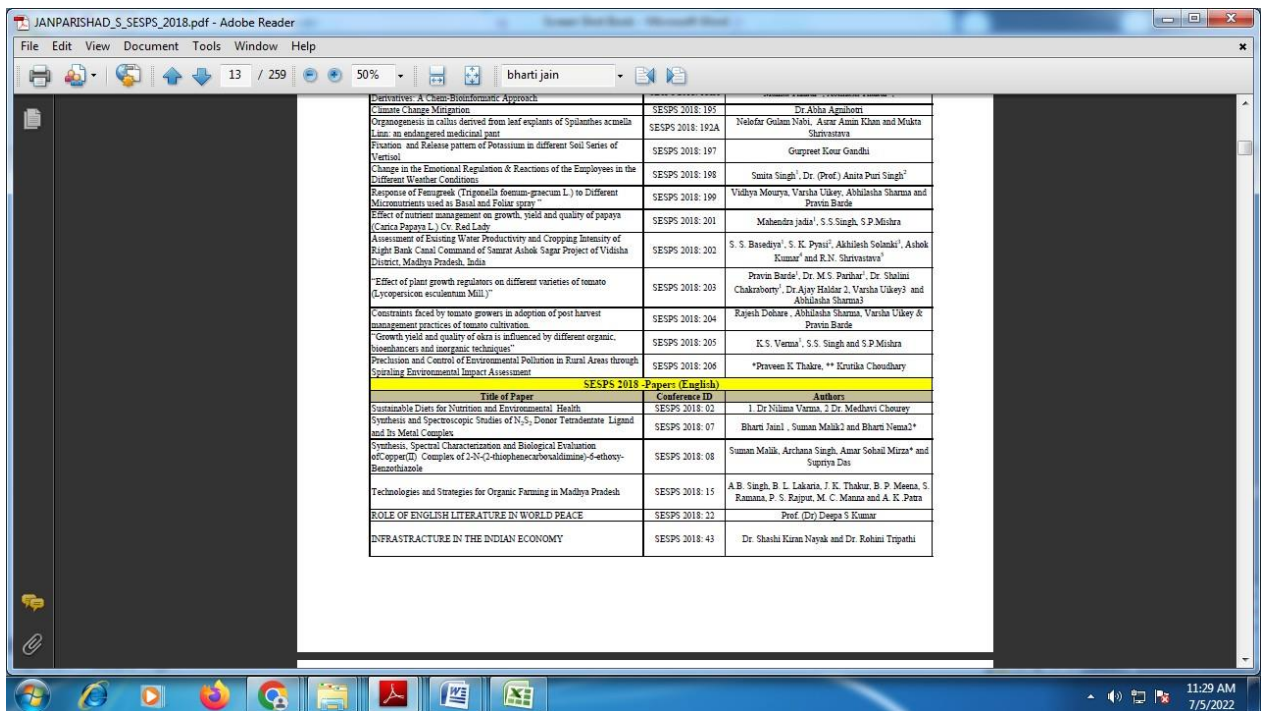
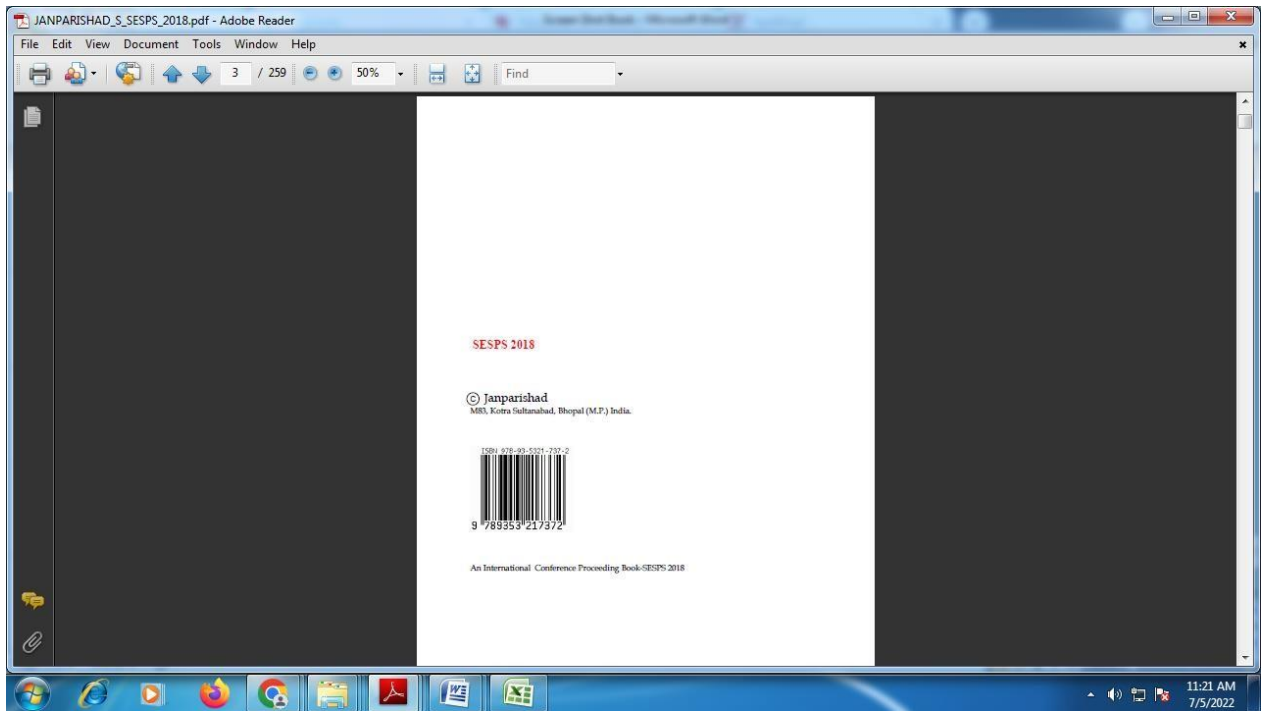
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Synthesis and Spectroscopic Studies of N,S Donor Tetradentate Ligand and Its Metal Complex
SESPIS 2018: 07

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ABSTRACT
Tetradentate ligand NN'-bis(2-thiophenecarboxaldimino)-o-phenylene diamine (TCO) was synthesized from the reaction of 2-thiophene-carboxaldehyde with o-phenylenediamine. A novel transition metal complex of Ni(II) donor tetradentate ligand has been synthesized by the reaction of ligand (TCO) with Ni(II) chloride in the molar ratio of 1:1. The mode of bonding and overall geometry of the complex was determined through FT-IR, elemental analysis, and electronic spectra studies. These studies revealed interesting properties for the newly synthesized complex.

Keywords: Tetradentate Ligand, Schiff base, Ni(II) complex, Octahedral

Introduction
A Schiff base is a neutral molecule with an electron pair and contains a carbon-nitrogen double bond. This class of compound was discovered in 1864 by Hugo Schiff, when he reacted an aldehyde and amine, leading to a Schiff base. The Schiff bases are also called as imines [1], imine and azoimines. Ligands derived from o-phenylenediamine and their metal complexes have many applications including biological [2], clinical [3] and analytical [4]. Schiff base ligands synthesized from 2-thiophene-carboxaldehyde and its metal complexes having many biological activities [5-6]. Compounds with N and S donor atoms such as N,S, are considered to be good coordinating ligands because they involve both hard nitrogen atoms and soft sulfur atoms. The importance of complexes with N,S ligands arise from use in the medical fields for therapeutic and diagnostic purposes [7, 8]. The studies of Schiff base formation as well as other catalytic addition reactions have attracted researchers for some time. Schiff bases derived from thiophene-2-carboxaldehyde have a wide variety of applications in biological [9] and analytical chemistry [10]. Schiff bases are known to be important inhibitors [11]. Transition metal complexes containing N and S donors are of more interest due to their applications in bioinorganic [12] and inorganic catalysis [13,14]. In the present work, Schiff base derived from thiophene-2-carboxaldehyde and o-phenylenediamine was prepared. The obtained Schiff base ligand reacted in 1:1 molar ratio with the appropriate metal salt using ethanol solvent. The work is dedicated to the synthesis, structural characterization of a new Ni(II) complex by using Schiff base ligand.

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Synthesis, Spectral Characterization and Biological Evaluation of Copper(II) Complex of 2-N-(2-thiophenecarboxaldimino)-6-ethoxybenzothiazole
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ABSTRACT
Schiff base ligand 2-N-(2-thiophenecarboxaldimino)-6-ethoxybenzothiazole (TCB) has been prepared from the condensation of 2-thiophene-carboxaldehyde and 2-amino-6-ethoxybenzothiazole. Copper(II) metal complex derived from 2-N-(2-thiophenecarboxaldimino)-6-ethoxybenzothiazole has been characterized using different chemical techniques such as elemental analysis, FTIR, magnetic moment and electronic spectra. Schiff base under investigation behaves as tridentate ligand. The UV-Vis spectra and magnetic moment data suggested distorted octahedral geometry of Cu(II) complex. The obtained chemical analysis data showed the formation of 1:2 (metal: ligand) ratio and overall studies revealed the binding site of ligand with metal ion is through the thioamide nitrogen, thiazole nitrogen and sulphur sulphur. The Schiff base and metal complex show good activity against the bacteria and fungi as compared to corresponding ligand.

Keywords: Schiff base, 2-amino-6-ethoxybenzothiazole, elemental analysis, antimicrobial, metal complexes.

INTRODUCTION
Schiff base structures provide a greater choice in flexibility, and complexation with a metal-ion adds to stability and versatility of the molecules containing -NH- groups [1]. Schiff base ligands are easily synthesized and form complexes with almost all metal ions and their complexes are considered to be among the most important new chemical models in main group and transition metal coordination chemistry because of their preparative accessibility and structural rigidity [2]. Extensive research has been carried out on transition metal complexes of symmetrical Schiff base ligand in 1:2 molar ratio. The presence of transition metal in human blood plasma indicates their importance in the mechanism for accumulating storage and transport of transition metal in living organisms [3]. Schiff base complexes play a vital role in designing metal complexes related to synthetic and natural oxygen carriers [4]. Besides their biological importance, they are also considered to perform various catalytic functions due to their binding behavior and capacity of stabilizing different metals in various oxidation states with unusual structural features [5]. Benzothiazole and its derivatives play an important role in analytical and several biological activities. Benzothiazole ring is present in various natural or semi-synthetic natural compounds which show useful biological activities [6]. The benzothiazole derivatives gained more importance and interest due to their anticancer [3], antiviral [7], antibacterial [8], antiparasitic [9] and fungicidal activities [10]. A wide variety of benzothiazole derivatives have been described for their chemotherapeutic activities, with low toxicity for the antimicrobial therapeutic use in man [11]. A thorough literature search shows that a very little work is done on the Schiff base prepared from the condensation reaction of 2-amino-6-ethoxybenzothiazole and 2-thiophene-carboxaldehyde i.e. 2-N-(2-thiophenecarboxaldimino)-6-ethoxybenzothiazole. In the present paper the synthesis, characterization and in vitro antimicrobial activity of the Schiff base ligand 2-N-(2-thiophenecarboxaldimino)-6-ethoxybenzothiazole (TCB) and its Cu(II) complex is being reported.

EXPERIMENTAL

Chemicals
All the chemicals used were of analytical reagent (AR) grade and of highest purity available. These include 2-amino-6-ethoxybenzothiazole, 2-thiophene-carboxaldehyde (Sigma Aldrich) and metal salt of copper (The Metals Pharmaceuticals Ltd.). Organic solvents used are absolute ethyl alcohol, acetone, triethylamine, DMF, DMSO and benzene.

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