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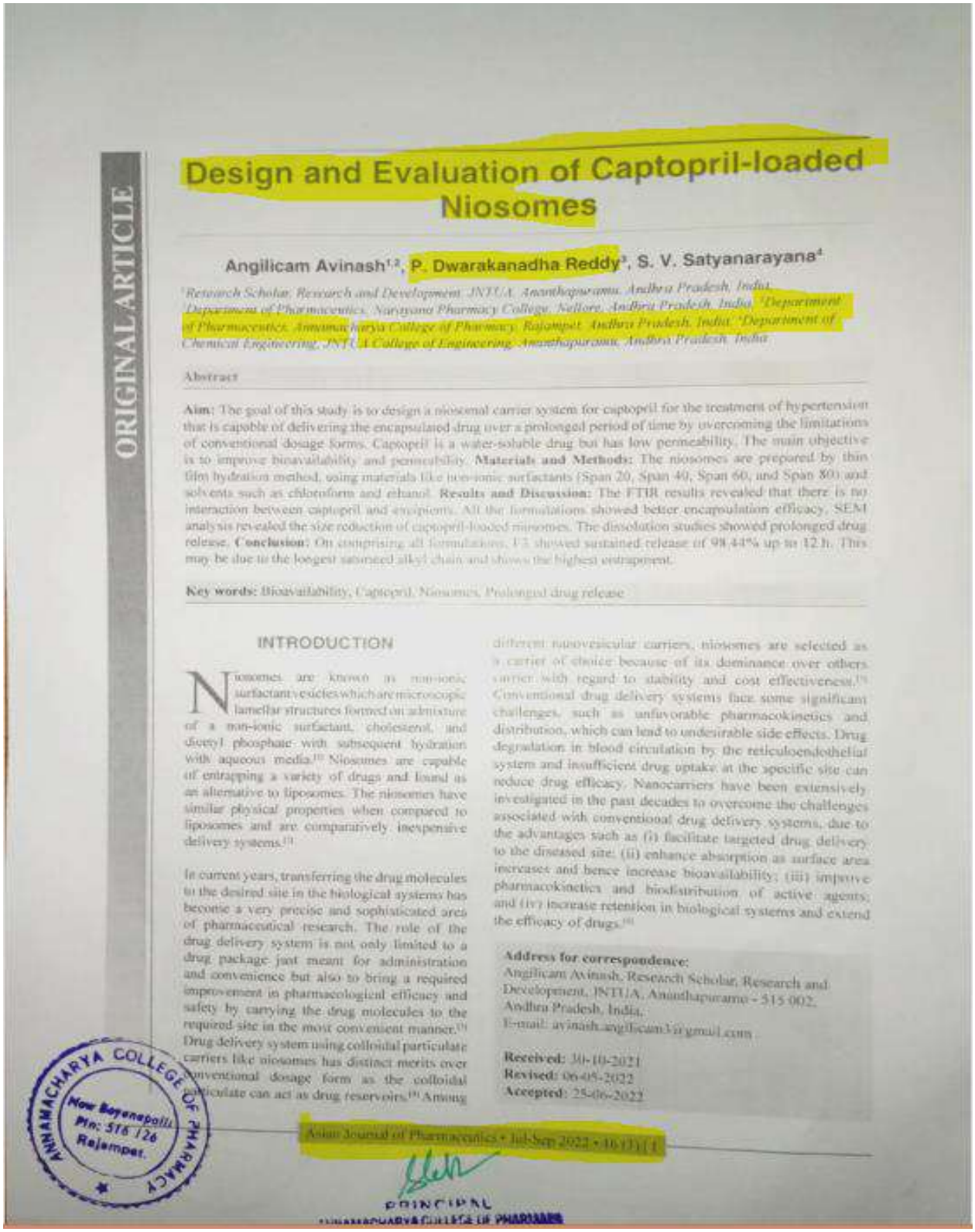

ORIGINAL ARTICLE

Design and Evaluation of Captopril-loaded Niosomes

Angilicam Avinash[1,2], P. Dwarakanadha Reddy[3], S. V. Satyanarayana[4]

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Abstract

Aim: The goal of this study is to design a niosomal carrier system for captopril for the treatment of hypertension that is capable of delivering the encapsulated drug over a prolonged period of time by overcoming the limitations of conventional dosage forms. Captopril is a water-soluble drug but has low permeability. The main objective is to improve bioavailability and permeability. **Materials and Methods:** The niosomes are prepared by thin film hydration method, using materials like non-ionic surfactants (Span 20, Span 40, Span 60, and Span 80) and solvents such as chloroform and ethanol. **Results and Discussion:** The FTIR results revealed that there is no interaction between captopril and excipients. All the formulations showed better encapsulation efficacy. SEM analysis revealed the size reduction of captopril-loaded niosomes. The dissolution studies showed prolonged drug release. **Conclusion:** On comprising all formulations, F3 showed sustained release of 98.44% up to 12 h. This may be due to the longest saturated alkyl chain and shows the highest entrapment.

Key words: Bioavailability, Captopril, Niosomes, Prolonged drug release

INTRODUCTION

Niosomes are known as non-ionic surfactant vesicles which are microscopic lamellar structures formed on admixture of a non-ionic surfactant, cholesterol, and dicetyl phosphate with subsequent hydration with aqueous media.[1] Niosomes are capable of entrapping a variety of drugs and found as an alternative to liposomes. The niosomes have similar physical properties when compared to liposomes and are comparatively inexpensive delivery systems.[2]

In current years, transferring the drug molecules to the desired site in the biological systems has become a very precise and sophisticated area of pharmaceutical research. The role of the drug delivery system is not only limited to a drug package just meant for administration and convenience but also to bring a required improvement in pharmacological efficacy and safety by carrying the drug molecules to the required site in the most convenient manner.[3] Drug delivery system using colloidal particulate carriers like niosomes has distinct merits over conventional dosage form as the colloidal particulate can act as drug reservoirs.[4] Among different nanovesicular carriers, niosomes are selected as a carrier of choice because of its dominance over others carrier with regard to stability and cost effectiveness.[5] Conventional drug delivery systems face some significant challenges, such as unfavorable pharmacokinetics and distribution, which can lead to undesirable side effects. Drug degradation in blood circulation by the reticuloendothelial system and insufficient drug uptake at the specific site can reduce drug efficacy. Nanocarriers have been extensively investigated in the past decades to overcome the challenges associated with conventional drug delivery systems, due to the advantages such as (i) facilitate targeted drug delivery to the diseased site; (ii) enhance absorption as surface area increases and hence increase bioavailability; (iii) improve pharmacokinetics and biodistribution of active agents; and (iv) increase retention in biological systems and extend the efficacy of drugs.[6]

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RESEARCH ARTICLE

Formulation and Evaluation of Fast Dissolving Tablets of Risperidone

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ABSTRACT

The present study was aimed towards the formulation and *In-vitro* evaluation of Rapid release tablets by direct compression method using Risperidone as a model drug to enhance patient compliance. Risperidone is an Antipsychotic drug, effective in the treatment of psychosis including schizophrenic, paranoid, schizoaffective, bipolar disorder, and other psychotic disorders. The half-life of the drug is about 4 hours and oral dose is 6 mg/day orally. Rapid release tablets provide instantaneous disintegration of tablet after oral administration. Rapid release tablets of Risperidone were prepared by using crospovidone and croscarmellose sodium in different concentrations as superdisintegrants. All the batches were prepared by direct compression method. Prepared tablets were evaluated for weight variation, hardness, friability, *in-vitro* disintegration time, dispersion time, thickness, drug content, wetting time and *in-vitro* dissolution study. By considering disintegration time and concentration of superdisintegrant, formulation F6 (crospovidone) showed maximum drug release of 98.93% and is considered as an optimized formulation which showed maximum percentage of drug release.

Keyword: Risperidone, Rapid release, Crospovidone, Croscarmellose sodium

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CONTENTS

1. Introduction

Fast dissolving tablets (FDTs) dissolve rapidly in the mouth and provide an excellent mouth feel. The tablet comprises a compound which melts at about 37°C. Many patients express difficulty in swallowing tablets and hard gelatin

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RESEARCH ARTICLE

Assesment of *In-Vitro* Antioxidant and Anti Inflammatory activity of Ethanolic Extract of *Colocasia Esculenta*

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ABSTRACT

Objective: To assess the *in vitro* antioxidant and anti-inflammatory activity of the ethanolic extract of *colocasia esculenta* **Methods:** *In vitro* antioxidant activity was evaluated for hydrogen peroxide scavenging assay, nitric oxide scavenging method, reducing power method and thiobarbituric method and in vitro anti-inflammatory activity is alos assessed by using inhibition of albumin denaturation method. **Results:** The ethanolic extract of *colocasia esculenta* shown hydrogen peroxide scavenging potential activity is 92.24% at 20µg/ml. The reducing power shows maximum activity shown 81.08% at 100µg/ml and the thio barbituric acid method shown maximum activity 98.4% at 100µg/ml. Ethanolic extract of *Colocasia esculenta* showed 95.56% inhibition of denaturation of albumin at 1000µg/ml concentration, while standard diclofenac showed 98.2% inhibition of denaturation of albumin. **Conclusion:** It can be concluded that ethanolic extract of *colocasia esculenta* shows good in vitro antioxidant and anti-inflammatory activities.

Keywords: Trapidil, sustained release, Guar gum, karaya gum and xanthan gum

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CONTENTS

1. Introduction

Oxidative stress is an imbalance in the redox status of a cell and the excessive production of radicals can lead to damages, mutations and ultimately the initiation of cancer. Ionizing radiation exposure can impact human health in different ways and cause a broad spectrum of adverse effects including anti-proliferative, pro-inflammatory and other biological effects. These effects are mainly due to

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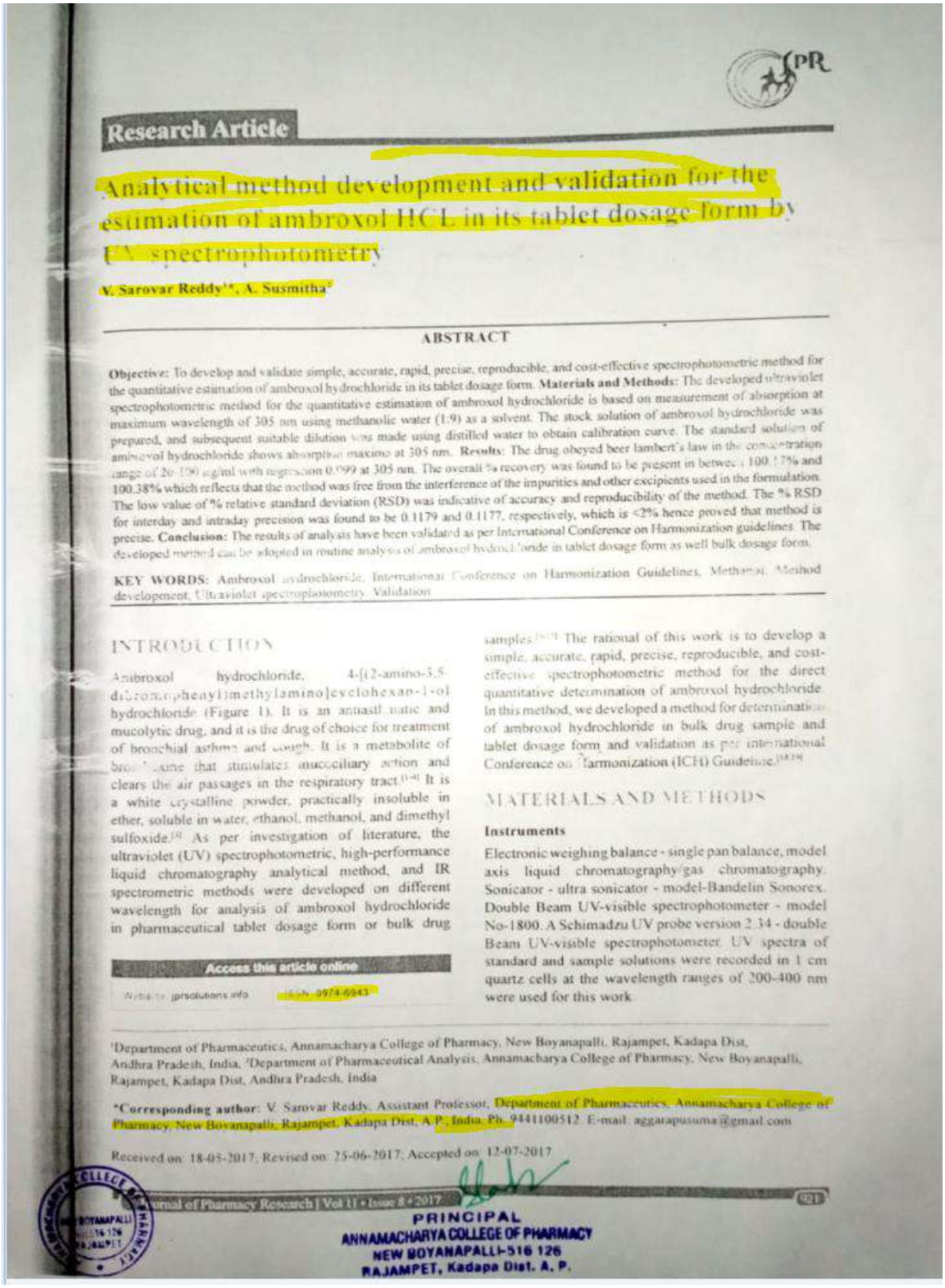

Research Article

Analytical method development and validation for the estimation of ambroxol HCL in its tablet dosage form by UV spectrophotometry

V. Sarovar Reddy[1]*, A. Susmitha[2]

ABSTRACT

Objective: To develop and validate simple, accurate, rapid, precise, reproducible, and cost-effective spectrophotometric method for the quantitative estimation of ambroxol hydrochloride in its tablet dosage form. **Materials and Methods:** The developed ultraviolet spectrophotometric method for the quantitative estimation of ambroxol hydrochloride is based on measurement of absorption at maximum wavelength of 305 nm using methanolic water (1:9) as a solvent. The stock solution of ambroxol hydrochloride was prepared, and subsequent suitable dilution was made using distilled water to obtain calibration curve. The standard solution of ambroxol hydrochloride shows absorption maxima at 305 nm. **Results:** The drug obeyed beer lambert's law in the concentration range of 20-100 µg/ml with regression 0.999 at 305 nm. The overall % recovery was found to be present in between 100.17% and 100.38% which reflects that the method was free from the interference of the impurities and other excipients used in the formulation. The low value of % relative standard deviation (RSD) was indicative of accuracy and reproducibility of the method. The % RSD for interday and intraday precision was found to be 0.1179 and 0.1177, respectively, which is <2% hence proved that method is precise. **Conclusion:** The results of analysis have been validated as per International Conference on Harmonization guidelines. The developed method can be adopted in routine analysis of ambroxol hydrochloride in tablet dosage form as well bulk dosage form.

KEY WORDS: Ambroxol hydrochloride, International Conference on Harmonization Guidelines, Method, Method development, Ultraviolet spectrophotometry, Validation

INTRODUCTION

Ambroxol hydrochloride, 4-[(2-amino-3,5-dibromophenyl)methylamino]cyclohexan-1-ol hydrochloride (Figure 1). It is an antiasthmatic and mucolytic drug, and it is the drug of choice for treatment of bronchial asthma and cough. It is a metabolite of bromhexine that stimulates mucociliary action and clears the air passages in the respiratory tract.[1-4] It is a white crystalline powder, practically insoluble in ether, soluble in water, ethanol, methanol, and dimethyl sulfoxide.[5] As per investigation of literature, the ultraviolet (UV) spectrophotometric, high-performance liquid chromatography analytical method, and IR spectrometric methods were developed on different wavelength for analysis of ambroxol hydrochloride in pharmaceutical tablet dosage form or bulk drug samples.[6-9] The rational of this work is to develop a simple, accurate, rapid, precise, reproducible, and cost-effective spectrophotometric method for the direct quantitative determination of ambroxol hydrochloride. In this method, we developed a method for determination of ambroxol hydrochloride in bulk drug sample and tablet dosage form and validation as per international Conference on Harmonization (ICH) Guideline.[10-13]

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MATERIALS AND METHODS

Instruments

Electronic weighing balance - single pan balance, model axis liquid chromatography/gas chromatography. Sonicator - ultra sonicator - model-Bandelin Sonorex. Double Beam UV-visible spectrophotometer - model No-1800. A Schimadzu UV probe version 2.34 - double Beam UV-visible spectrophotometer. UV spectra of standard and sample solutions were recorded in 1 cm quartz cells at the wavelength ranges of 200-400 nm were used for this work.

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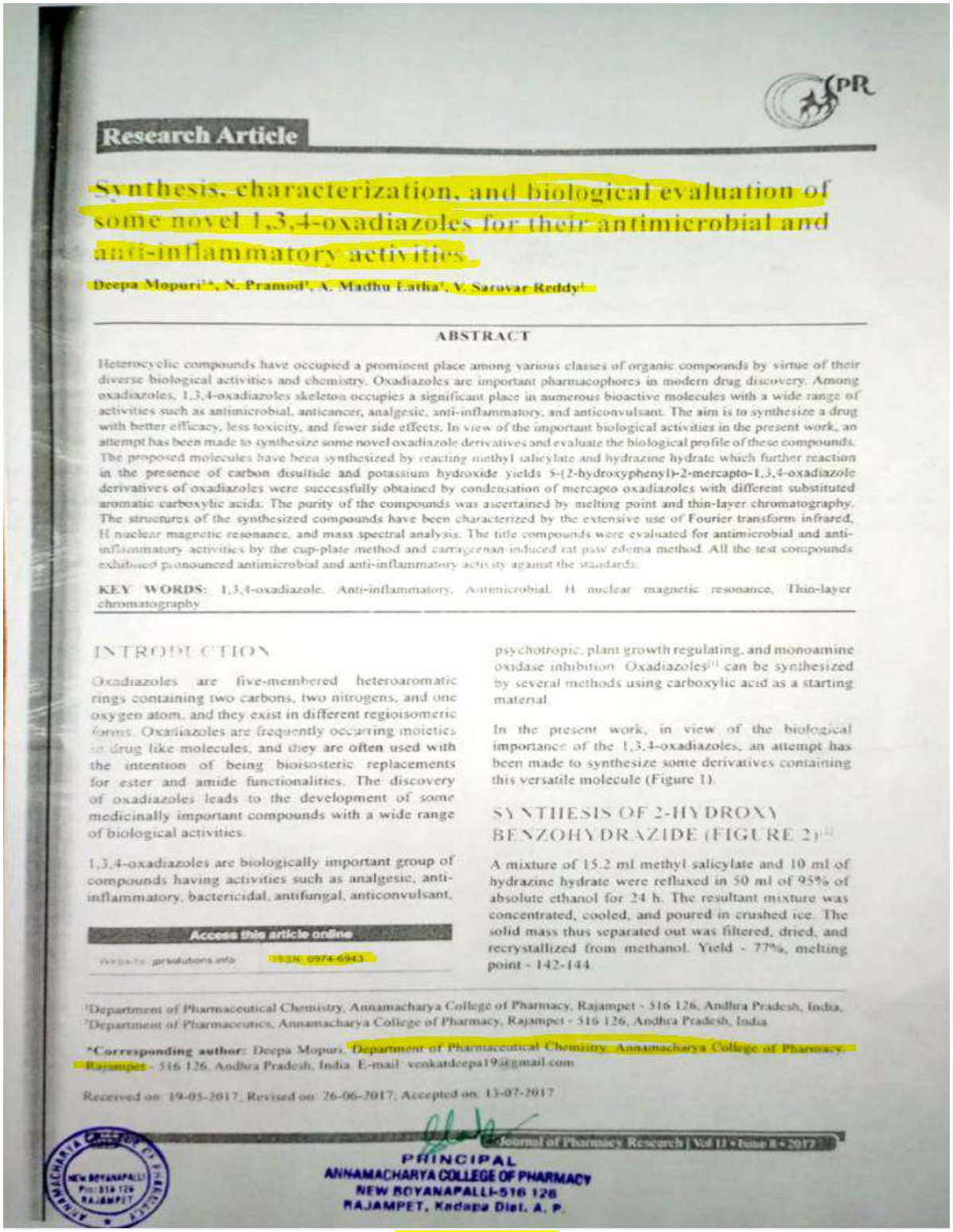

Research Article

Synthesis, characterization, and biological evaluation of some novel 1,3,4-oxadiazoles for their antimicrobial and anti-inflammatory activities

Deepa Mopuri[1]*, N. Pramod[1], A. Madhu Latha[1], V. Sarovar Reddy[2]

ABSTRACT

Heterocyclic compounds have occupied a prominent place among various classes of organic compounds by virtue of their diverse biological activities and chemistry. Oxadiazoles are important pharmacophores in modern drug discovery. Among oxadiazoles, 1,3,4-oxadiazoles skeleton occupies a significant place in numerous bioactive molecules with a wide range of activities such as antimicrobial, anticancer, analgesic, anti-inflammatory, and anticonvulsant. The aim is to synthesize a drug with better efficacy, less toxicity, and fewer side effects. In view of the important biological activities in the present work, an attempt has been made to synthesize some novel oxadiazole derivatives and evaluate the biological profile of these compounds. The proposed molecules have been synthesized by reacting methyl salicylate and hydrazine hydrate which further reaction in the presence of carbon disulfide and potassium hydroxide yields 5-(2-hydroxyphenyl)-2-mercapto-1,3,4-oxadiazole derivatives of oxadiazoles were successfully obtained by condensation of mercapto oxadiazoles with different substituted aromatic carboxylic acids. The purity of the compounds was ascertained by melting point and thin-layer chromatography. The structures of the synthesized compounds have been characterized by the extensive use of Fourier transform infrared, H nuclear magnetic resonance, and mass spectral analysis. The title compounds were evaluated for antimicrobial and anti-inflammatory activities by the cup-plate method and carrageenan-induced rat paw edema method. All the test compounds exhibited pronounced antimicrobial and anti-inflammatory activity against the standards.

KEY WORDS: 1,3,4-oxadiazole, Anti-inflammatory, Antimicrobial, H nuclear magnetic resonance, Thin-layer chromatography

INTRODUCTION

Oxadiazoles are five-membered heteroaromatic rings containing two carbons, two nitrogens, and one oxygen atom, and they exist in different regioisomeric forms. Oxadiazoles are frequently occurring moieties in drug like molecules, and they are often used with the intention of being bioisosteric replacements for ester and amide functionalities. The discovery of oxadiazoles leads to the development of some medicinally important compounds with a wide range of biological activities.

1,3,4-oxadiazoles are biologically important group of compounds having activities such as analgesic, anti-inflammatory, bactericidal, antifungal, anticonvulsant, psychotropic, plant growth regulating, and monoamine oxidase inhibition. Oxadiazoles[1] can be synthesized by several methods using carboxylic acid as a starting material.

In the present work, in view of the biological importance of the 1,3,4-oxadiazoles, an attempt has been made to synthesize some derivatives containing this versatile molecule (Figure 1).

SYNTHESIS OF 2-HYDROXY BENZOHYDRAZIDE (FIGURE 2)[2]

A mixture of 15.2 ml methyl salicylate and 10 ml of hydrazine hydrate were refluxed in 50 ml of 95% of absolute ethanol for 24 h. The resultant mixture was concentrated, cooled, and poured in crushed ice. The solid mass thus separated out was filtered, dried, and recrystallized from methanol. Yield - 77%, melting point - 142-144.

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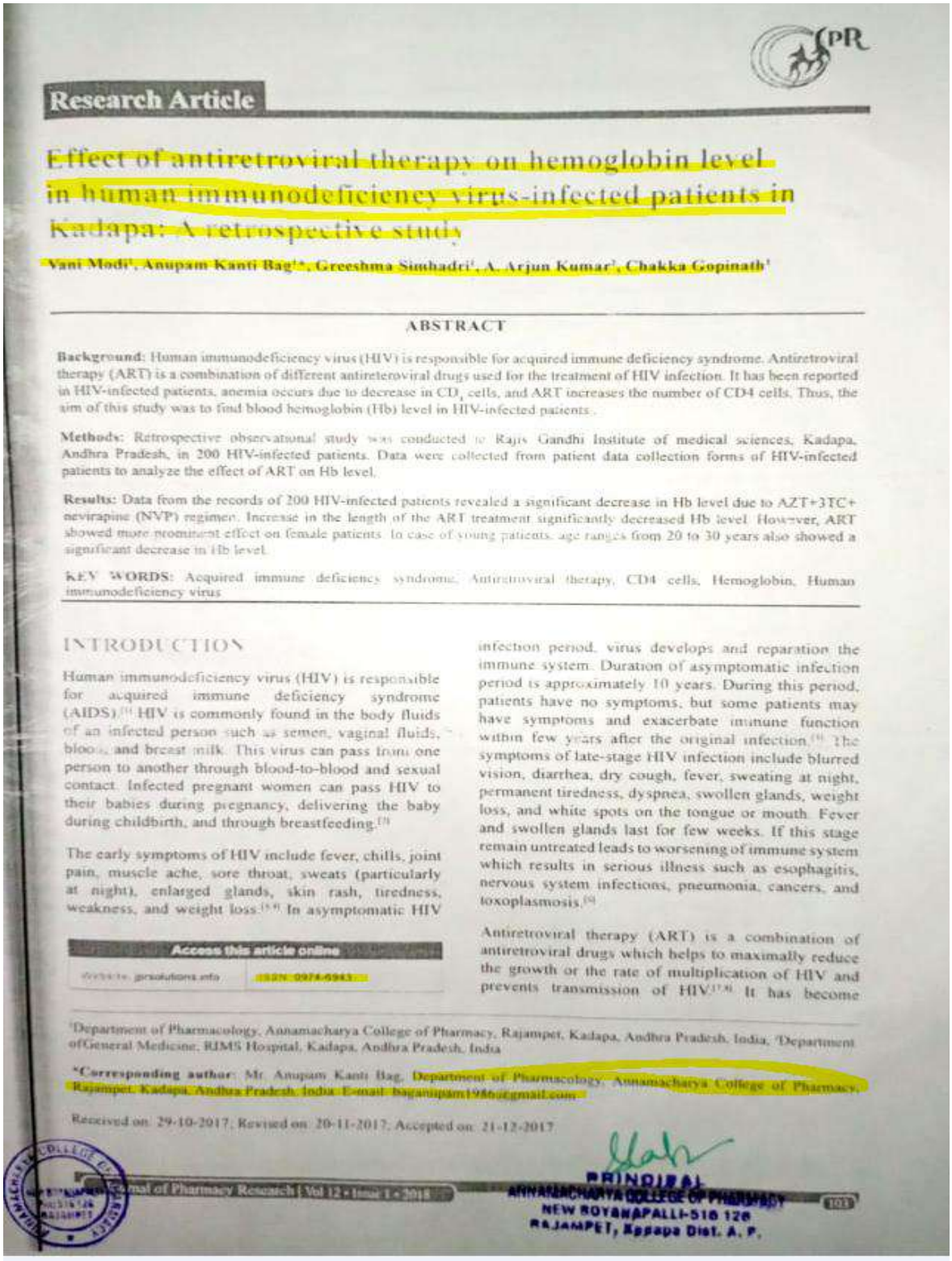

Research Article

Effect of antiretroviral therapy on hemoglobin level in human immunodeficiency virus-infected patients in Kadapa: A retrospective study

Vani Modi[1], Anupam Kanti Bag[1]*, Greeshma Simhadri[1], A. Arjun Kumar[2], Chakka Gopinath[1]

ABSTRACT

Background: Human immunodeficiency virus (HIV) is responsible for acquired immune deficiency syndrome. Antiretroviral therapy (ART) is a combination of different antireteroviral drugs used for the treatment of HIV infection. It has been reported in HIV-infected patients, anemia occurs due to decrease in CD_4 cells, and ART increases the number of CD4 cells. Thus, the aim of this study was to find blood hemoglobin (Hb) level in HIV-infected patients.

Methods: Retrospective observational study was conducted in Rajiv Gandhi Institute of medical sciences, Kadapa, Andhra Pradesh, in 200 HIV-infected patients. Data were collected from patient data collection forms of HIV-infected patients to analyze the effect of ART on Hb level.

Results: Data from the records of 200 HIV-infected patients revealed a significant decrease in Hb level due to AZT+3TC+ nevirapine (NVP) regimen. Increase in the length of the ART treatment significantly decreased Hb level. However, ART showed more prominent effect on female patients. In case of young patients, age ranges from 20 to 30 years also showed a significant decrease in Hb level.

KEY WORDS: Acquired immune deficiency syndrome, Antiretroviral therapy, CD4 cells, Hemoglobin, Human immunodeficiency virus

INTRODUCTION

Human immunodeficiency virus (HIV) is responsible for acquired immune deficiency syndrome (AIDS).[1] HIV is commonly found in the body fluids of an infected person such as semen, vaginal fluids, blood, and breast milk. This virus can pass from one person to another through blood-to-blood and sexual contact. Infected pregnant women can pass HIV to their babies during pregnancy, delivering the baby during childbirth, and through breastfeeding.[2]

The early symptoms of HIV include fever, chills, joint pain, muscle ache, sore throat, sweats (particularly at night), enlarged glands, skin rash, tiredness, weakness, and weight loss.[3-5] In asymptomatic HIV infection period, virus develops and reparation the immune system. Duration of asymptomatic infection period is approximately 10 years. During this period, patients have no symptoms, but some patients may have symptoms and exacerbate immune function within few years after the original infection.[3] The symptoms of late-stage HIV infection include blurred vision, diarrhea, dry cough, fever, sweating at night, permanent tiredness, dyspnea, swollen glands, weight loss, and white spots on the tongue or mouth. Fever and swollen glands last for few weeks. If this stage remain untreated leads to worsening of immune system which results in serious illness such as esophagitis, nervous system infections, pneumonia, cancers, and toxoplasmosis.[6]

Antiretroviral therapy (ART) is a combination of antiretroviral drugs which helps to maximally reduce the growth or the rate of multiplication of HIV and prevents transmission of HIV.[7,8] It has become

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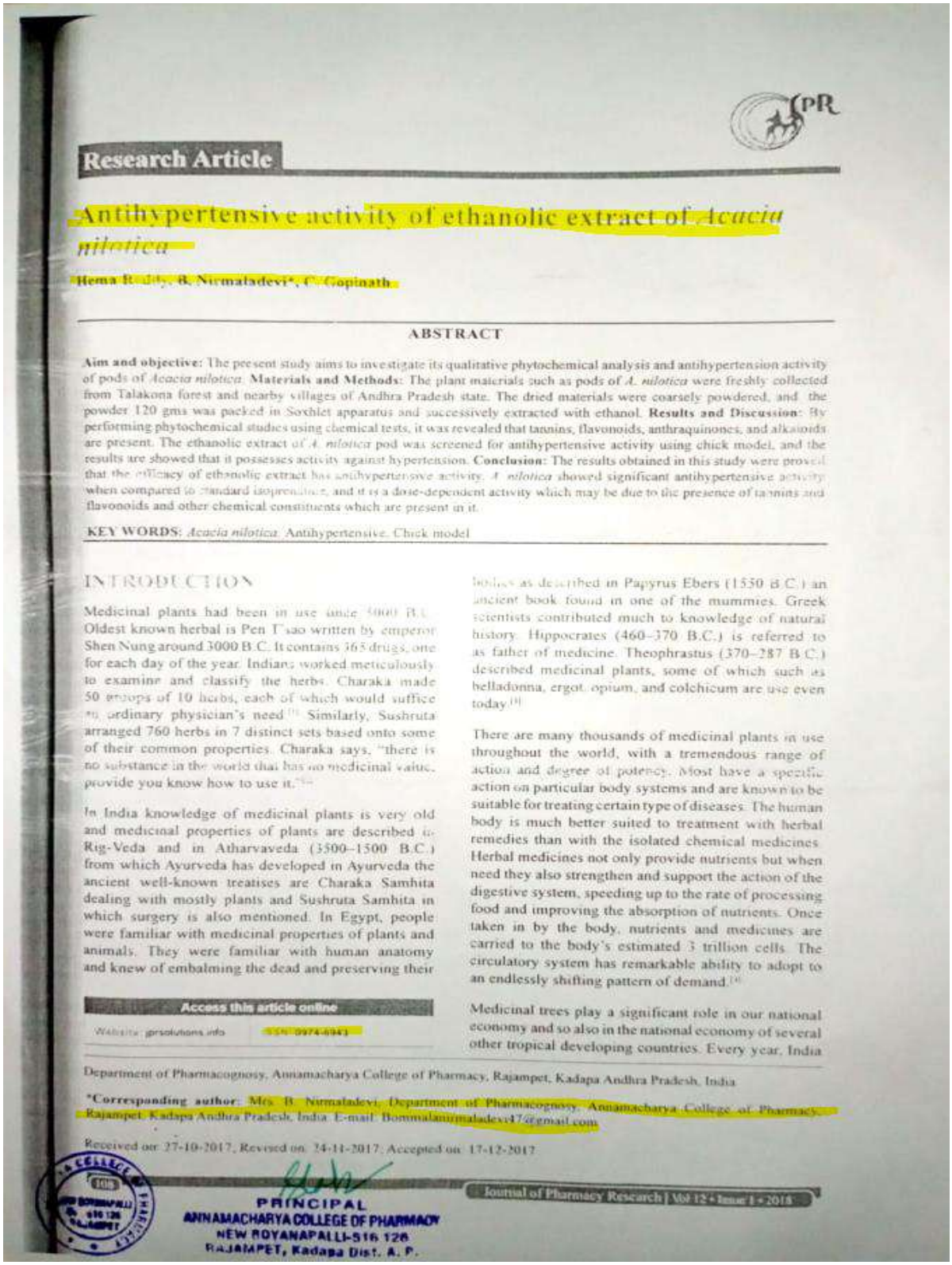

Research Article

Antihypertensive activity of ethanolic extract of *Acacia nilotica*

Hema Reddy, B. Nirmaladevi*, C. Gopinath

ABSTRACT

Aim and objective: The present study aims to investigate its qualitative phytochemical analysis and antihypertension activity of pods of *Acacia nilotica*. **Materials and Methods:** The plant materials such as pods of *A. nilotica* were freshly collected from Talakona forest and nearby villages of Andhra Pradesh state. The dried materials were coarsely powdered, and the powder 120 gms was packed in Soxhlet apparatus and successively extracted with ethanol. **Results and Discussion:** By performing phytochemical studies using chemical tests, it was revealed that tannins, flavonoids, anthraquinones, and alkaloids are present. The ethanolic extract of *A. nilotica* pod was screened for antihypertensive activity using chick model, and the results are showed that it possesses activity against hypertension. **Conclusion:** The results obtained in this study were proved that the efficacy of ethanolic extract has antihypertensive activity. *A. nilotica* showed significant antihypertensive activity when compared to standard isoprenaline, and it is a dose-dependent activity which may be due to the presence of tannins and flavonoids and other chemical constituents which are present in it.

KEY WORDS: *Acacia nilotica*, Antihypertensive, Chick model

INTRODUCTION

Medicinal plants had been in use since 5000 B.C. Oldest known herbal is Pen T'sao written by emperor Shen Nung around 3000 B.C. It contains 365 drugs, one for each day of the year. Indians worked meticulously to examine and classify the herbs. Charaka made 50 groups of 10 herbs, each of which would suffice an ordinary physician's need.[1] Similarly, Sushruta arranged 760 herbs in 7 distinct sets based onto some of their common properties. Charaka says, "there is no substance in the world that has no medicinal value, provide you know how to use it."[2]

In India knowledge of medicinal plants is very old and medicinal properties of plants are described in Rig-Veda and in Atharvaveda (3500–1500 B.C.) from which Ayurveda has developed in Ayurveda the ancient well-known treatises are Charaka Samhita dealing with mostly plants and Sushruta Samhita in which surgery is also mentioned. In Egypt, people were familiar with medicinal properties of plants and animals. They were familiar with human anatomy and knew of embalming the dead and preserving their bodies as described in Papyrus Ebers (1550 B.C.) an ancient book found in one of the mummies. Greek scientists contributed much to knowledge of natural history. Hippocrates (460–370 B.C.) is referred to as father of medicine. Theophrastus (370–287 B.C.) described medicinal plants, some of which such as belladonna, ergot, opium, and colchicum are use even today.[3]

There are many thousands of medicinal plants in use throughout the world, with a tremendous range of action and degree of potency. Most have a specific action on particular body systems and are known to be suitable for treating certain type of diseases. The human body is much better suited to treatment with herbal remedies than with the isolated chemical medicines. Herbal medicines not only provide nutrients but when need they also strengthen and support the action of the digestive system, speeding up to the rate of processing food and improving the absorption of nutrients. Once taken in by the body, nutrients and medicines are carried to the body's estimated 3 trillion cells. The circulatory system has remarkable ability to adopt to an endlessly shifting pattern of demand.[4]

Medicinal trees play a significant role in our national economy and so also in the national economy of several other tropical developing countries. Every year, India

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