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Phytochemical Analysis of Ethanolic Extract of *Lantana Camara*

Satyendra Kumar*[1], Rajeev Nema[2], Anand Kumar Yadav[3]

[1]Research Scholar,Dept of Zoology, Agra College, Agra, [3] Associate Professor Dept of Zoology, Agra College, Agra, Uttar Pradesh-282004, India

[2] Research associate, Department of Biochemistry, All India Institute of Medical Sciences (AIIMS) Bhopal, Saket Nagar, Bhopal 462020, India

*Corresponding Author email: satyen007@gmail.com

Abstract

This research article has explored *Lantana Camara* as a Medicinal plantthat have therapeuticpotential due to the presence of natural antioxidants functioning as reducing agents, free radicalscavengers and quenchers of singlet oxygen. The majority of *LantanaCamara's*antioxidant activity isdue to phytochemical compounds viz. alkaloids, saponins, tannins, phenolic compounds, flavonoids etc. A bioactiveconstituent has always been a challenging task forresearchers. Our study showed a photochemical analysis of *Lantana Camara*.Total phenolic content (TPC) and total flavonoids content (TFC) were estimated tobe 74.15mg GAE/g of extract and35.54 mg QE/g of extractrespectively

1. Introduction

Phytochemicals are a broad category of constituents and substances of plants [1]. These substances of the plant can be present in different plants part like stem, roots, leaves, trunk, seeds, fruits, etc. Plant constitutes are known as phytochemicals they are bioactive molecules found in plants that have been linked to the prevention of chronic illnesses in humans [2].Plantshave been the most extensively researched source of therapeutic chemicals. The extensive history of therapeutic (ethnomedical) applications has offered critical guidance in contemporary research aimed at determining the active compounds contained in a specific medicinal plant [3]. If the active chemicals come from plants previously utilized for human use, therapeutic natural products are likely to be safer than synthetically created novel chemical entities. Furthermore, when one or more extracts of a given plant have some biological activity in preventing or treating a specific illness symptom, there is a potential opportunity to explore lead compounds from such plants [4-5].

2. Material and Method

2.1. Collection of plant material

Fresh leaves of Lantana camara were collected from the Sanjivini ayurvedic nursery, Bhopal (M.P.).Plant's leaves were subjected to the shade dried, dried leaves crushed well with pestle and mortor, crushed leaves was stored in airtight glass container for further use.

2.2. Preparation of plant extract

Crushed leaves were subjected to the extraction in Soxhlet apparatus. 30gm of crushed leaves are packed in thimble tube and 300 ml of ethanol pour in the bottom flask. Extraction procedure should be continued till the siphon tube of Soxhlet become colorless, the extraction procedure took 18 hrs. Pour ethanol from bottom flask to a beaker and keep the beaker in hot water wath at 40^{o}C till the all ethanol get evaporated and dried crude extract was found [6].

2.3. Qualitative Phytochemical Analysis

Extract was subjected to the following test for the presence of phytochemicals [7-8]

2.3.1. Test for protein

Millon's test

2ml of Millon's reagent mixed with crude extract, on heating red colored appeared, which confirmed the protein presence in the crude sample.

Ninhydrin test

2ml of 0.2% solution of Ninhydrin pour in crude extract, mix well and upon boiling violet color appeared which confirmed the presence of amino acids and protein.

2.3.2. Test for carbohydrates

Fehling's test

1 ml of each Fehling A and Fehling B reagents were mixed together in crude extract and upon heating brick-red precipitate observed confirmed the presence of reducing sugars

Benedict's test

2ml of Benedict's reagent add in crude extract upon boiling a red-brown color confirmed the presence of carbohydrate.

2.3.3. Test for glycosides

In the test tube Crude extract was taken to this add 2ml of chloroform and mixed well. To this solution add 2ml of conc. H_2SO_4 was added carefully and shaken. Areddish-brown color indicated the presence of the glycoside.

2.3.4. Test for phenols and tannins

Add distilled water in Crude extract and warmed to this add 2ml of 2% solution of FeCl3. A formation of blue-green color confirmed the presence of phenols and tannins.

2.3.5. Test for steroid

2ml of chloroform added in crude extract, then 2ml conc. H_2SO_4 was poured along the side of test tube red colored confirmed the presence of steroids.

2.3.6. Test for alkaloids

2ml of 1% HCl added in crude sample heated then add Mayer's and Wagner's reagents. Turbidity indicates the presence of alkaloids.

2.3.7. Test for saponins

In a test tube 5ml of distilled water add in crude extract and mixed well. It was shaken vigorously; formation of stable foam indicated the presence of saponins.

2.3.8. Test for flavonoids

Alkaline reagent test

On addition of 2ml of 2% solution of NaOH in crude extract sample. Deep yellow color was appeared, to this on addition of few drops of diluted acid solution will be colorless, this confirmed the presence of flavonoids.

Shinoda test

fragments of magnesium ribbon mixed with crude extract sample and to this conc. HCl was added drop wise. After few minutes pink color will appeared which indicated the presence of flavonoids.

2.3.9.Terpenoids Presence Test

Add 2ml of chloroform into plant extract and dissolved well, and evaporated the solution till the dried. 2ml of conc. H_2SO_4 was added to this and heated. A greyish color confirmed terpenoids presence.

2.4. Quantitative Phytochemical Analysis

The extracts obtained from the plants were estimated to find out TPC and TFC using several conventional chemical and analytical methods.

2.4.1. Total Phenolic Content Determination[10]

TPC was estimated by the Folin- Ciocalteu's assay and gallic acid used as standard.1 ml extract (100mg/ml) taken in test tube to this add 3 ml FCR after that 5 minutes later add 3 ml of 7% $NaCO_3$ solution. Test tube make up to 10 milliliters with DW. Allow all the test tube for 90 min. at 37°C. Absorbance taken against blank @ 750 nm. The values wereexpressed in mg GAE per gof extract. Plate reader and data analysis software BMG Fluostar GERMANY; MODE: Equivalent/gextract.

2.4.2. Total Flavonoid Content Determination[10]

$AlCl_3$ method was used to calculate TFC with quercetin as standard. A flask taken in which add 2 ml extract (100mg/ml) and 8 ml DW. 5 min. later Add 0.6 ml of 5 percent $NaNO_2$, and 0.6 ml 10 percent $AlCl_3$. Then, add 1ml of 1 M NaOH after 6 min room temperature incubation. With DW test tube make up to to 10 ml. A spectrophotometer (BMG Fluostar, GERMANY) was used to take absorbance of the sample against the blank @ 510 nm. TFC expressed in mg QE / g ofextract. Plate reader and data analysis software BMG Fluostar GERMANY; MODE: Equivalent/g extract.

2. Results

3.1. Qualitative Phytochemical analysis

Table 1 showing results of qualitative phytochemicals. Protein, carbohydrates, glycosides, steroids, saponins are appears in modest concentration, while phenols, alkaloids, flavonoids presnt in high concentration.

Table 1

Qualitative phytochemical analysis of leaf extracts of L. camara

Constituents	Presence
Test for protein	+
Test for carbohydrates	+
Test for glycosides	+
Test for phenols and tannins	+
Test for steroid	+
Test for alkaloids	+
Test for saponins	+
Test for flavonoids	+
Test for terpenoid	+

+: Positive, - : Negative

3.2. Quantitave phytochemical analysis

3.2.1. Total phenolic content (TPC)

Result shown in Table2 Total phenolic content estimated using gallic acid as standard.Results are expressed as a mg GAE/g of extracted sample.

3.2.2. Total flavonoids content (TFC)

Result shown in Table 2 Total flavonoids content estimated using Quercetin as standard.Results are

expressed as mg QE/g of extracted sample.

Table 12

Quatitative phytochemical analysis of leaf extracts of L. camara

TEST	RESULTS
Total phenolic content (TPC)	74.15mg GAE/g of extract
Total flavonoids content (TFC)	35.54mg QE/g of extract

4.Discussion

Preliminary Phytochemical analysis of ethanolic extract of *Lantana Camara* showed the presence of proteins, carbohydrates, tannins, phenolic compounds, flavonoids, glycosides, saponins, alkaloids, steroids and terpenoids.ethanolic extract of *Lantana Camara* phytochemicals results are in line with the other studies except for a few exceptions [10]

Antioxidant and cytotoxic of any plant extract depends on the phytochemicals present in the plant, different phytochemicals show different activities such as tannin shows cytotoxicity on *A-549* cell lines and antioxidant activity [11], phenolic and flavonoids content are responsible for antioxidant activity [12], plants Steroids have anti-inflammatory effects [13], terpenes inhibited cell proliferation, decreased tumour growth, induced apoptosis, increased sensitivity to radiotherapy, exhibited cytotoxic effects [14], saponins, are proved to anti tumours, anti-inflammatory [15], alkaloids show cytotoxicity [16].Rabia naz et al. 2103 determined TPC of the ethanol extract of *Lantana Camara* and found to be 40.85mg GAE/g of the extract [17], in this present study TPC was found to be 74.4 mg GAE/g of extract which was higher.Rabia naj et al. 2013 reported total flavonoids in ethanolic extract of *Lantana Camara* 53.11 mg RU/ g of extract which was higher than found in the present study [17].

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